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University**

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**Counterfeit pesticides: a mixed-methods study  
of a transnational organised crime threat to  
the UK agricultural industry**

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Thesis submitted in fulfilment of the requirements  
of a Doctor of Philosophy (PhD) degree

April 2016



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University

*This thesis is dedicated to the memory of my late father Colin.*

*A quiet inspiration to just get on with it.*

## **Abstract**

The proliferation of counterfeit plant protection products (pesticides) has been widely reported in agricultural trade journals and in the popular press. A review of these publications showed that there is a common narrative, and one which draws heavily on industry derived data. A recent UK Intellectual Property Office (IPO) review of the calibre of contemporary counterfeiting research cast doubt upon the veracity of such data sources.

The aim of the study was to ascertain the nature of this crime as it occurs in the UK and to determine the threat it poses to the agricultural industry. This was achieved by mixed-methods research, a strategy endorsed by the IPO as a means of more accurately capturing the characteristics of a counterfeiting problem when compared to a single strand study.

The results of the research suggested that the industry derived narrative is a reasonable reflection of the UK counterfeit pesticide problem, at least in so far that it recognises the mechanics of the crime. However, the data also revealed that there are characteristics of this illicit trade that have not been previously described. It was apparent that whilst the modus operandi is widely appreciated it is underpinned by a market dynamic that is far less well understood. This dynamic is the product of the confluence of a poorly policed amenity market for pesticides, an industry response that is unduly focused on legislative change, and a rural police force that is largely concerned with reducing theft from farms.

It was the conclusion of the thesis that a means of reducing the counterfeit pesticide threat is to be found in disrupting its underlying dynamic. Recommendations are made to achieve this, including making better use of industry derived intelligence and raising awareness of the problem amongst farmer users of pesticides and enforcement agency staff.

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## Table of Acronyms

<b>Acronym</b>	<b>Meaning</b>
CPMM	Convergent Parallel Mixed Method
CRD	Chemicals Regulation Directorate
DEFRA	Department for Environment Food & Rural Affairs
EaW	England and Wales
ECPA	European Crop Protection Association
EU	European Union
EUROPOL	European Police Office
FoIA	Freedom of Information Act
HMRC	Her Majesty's Revenue and Customs
IP	Intellectual Property
IPO	Intellectual Property Office
MAPP	Ministerially Approved Pesticide Product
NCA	National Crime Agency
NFU	National Farmers Union
OCG	Organised Crime Group
OECD	Organisation for Economic Co-operation and Development
OLAF	European Anti-fraud Office
PIPCU	Police Intellectual Property Crime Unit
QDA	Qualitative Data Analysis
SOSR	Spring Oilseed Rape
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
UNODC	United Nations Office on Drugs and Crime
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

## 1.0 Introduction

*“The illegal trade in counterfeit pesticides has grown into a multimillion-euro industry in Europe, putting consumers’ lives and farmers’ livelihoods at risk as unregulated and often toxic chemicals enter the food chain.”* (Henshaw, 2011)

In 2011 the Wall Street Journal published an online article entitled *Fake Pesticides Are a Growing Danger*, the extract given above being the piece’s impactful opening statement. In her article Caroline Henshaw described a trade dominated by highly organised transnational crime gangs who are exploiting a lucrative illicit market. She gave graphic examples of unapproved pesticides being produced in the Far East and entering Europe through permeable Eastern borders. Once inside European boundaries they find their way into the distribution network and ultimately to farms where they are used on crops destined for human consumption. Henshaw quoted an industry spokesman who warned of “a massive inflow of untested and potentially dangerous pesticides into the EU, thus critically undermining one of the most regulated product markets”. Whilst this was certainly not the first time this crime had been the subject of popular reporting it was, at the time of publication, the highest profile media source in which an article had appeared on the subject. It was the decision of such a renowned media outlet to highlight this crime that prompted the author of this thesis to question whether what was being described as a European problem had implications for the agricultural sector in the United Kingdom (UK) and if it did to what extent the risk it posed had been investigated<sup>1</sup>.

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<sup>1</sup> The UK in this context is understood to mean the United Kingdom of Great Britain and Northern Ireland. It is recognised that there are variations in both pesticide regulation and enforcement practice (including the police) between England and Wales, Northern Ireland, and

This was a reasonable question to ask, for recent history suggests that this was not a crime that could be safely ignored. Over several decades repeated incursions into the legitimate pesticide markets by counterfeiters has had a devastating impact on local agricultural economies. In 1979 an incident of widespread crop failure that subsequently became known as the 'great Kenyan coffee crop disaster' was the result of a fake Chevron fungicide being used on a large proportion of the crop (Wadlow, 2009). The longer-term consequence was an industry with a much diminished international reputation from which it took many years to recover. In 2007 peppers that were for sale on German supermarket shelves were tested and found to contain residues of an illicit insecticide (CVUA Stuttgart, 2007; British Association to Stop Counterfeiting and Piracy, 2008). The source of the peppers was traced back to the Almeria region of Spain, an area whose agricultural economy relies heavily on this particular crop. Exports were immediately halted and, in a similar fashion to the earlier Kenyan coffee crop incident, the economy of the area almost collapsed. It was recently estimated that in 2013 30% of the Indian pesticides market was lost to counterfeit products (Business Standard, 2015). In 2015, across India as a whole, 10.6 million tonnes of agricultural product will have been destroyed as a direct result of it being found to have been treated with counterfeit pesticide (Business Standard, 2015). It is also suggested that, if the activities of those crime gangs responsible goes unchecked, by 2019 almost 40% of all pesticides sold will be illegal (Business Standard, 2015).

Whilst such dramatic incidents might not be commonplace they reflect the tip of a very large fake product iceberg (OECD, 2008) for the pesticides industry is but one amongst many industrial sectors that have fallen victim to the activities of the counterfeiter (Stewart et al., 2007). Unfortunately a true measure of the scale of the

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Scotland. However, the extent of commonality was such that this was not deemed to be a limiting factor and indeed in the course of the study this proved to be the case.

problem has proved elusive, in part because despite its seemingly ubiquitous nature counterfeiting is a crime that lacks a universal definition. That said common usage of the term generally reflects the meaning adopted in UK Government literature wherein it is described as “the manufacture, importation, distribution and sale of products which falsely carry the trademark of a genuine brand without permission and for gain or loss to another” (Intellectual Property Office, 2014). A preliminary review of industry, governmental, and non-governmental (NGO) sources suggested that, despite variation in strict definition, it is recognised as being a major and rapidly growing worldwide crime problem (Phillips, 2007). It has been suggested that the value of counterfeit goods traded in 2015 is likely to be in the order of \$1.77 trillion (International Chamber of Commerce, 2015). Such estimates of the overall scale of the problem run parallel to accounts of counterfeit goods appearing in increasingly diverse market sectors, often far removed from their long established stronghold in luxury goods such as designer clothing or watches (Stewart et al., 2007). Henshaw’s article may have focused on the trade in illegal pesticides but such reporting is far from unusual; similar stories are to be found in trade journals and popular press articles spanning numerous industries. However, and despite the plethora of popular writing on the wider counterfeiting problem, a preliminary search of the literature found few examples of methodologically defined study of the problem at industry sector level. There was no evidence of recognisably academic research being conducted into a UK counterfeit pesticides problem.

Whilst this initial scoping exercise was far from being a comprehensive review of the problem it did suggest that there may be a significant gap in the literature and therefore a potential need for research. Indeed the seeming extent of this omission was such that it would have been easy to have been over-ambitious as to what this study might hope to achieve. With this in mind, and recognising that this was to be a resource



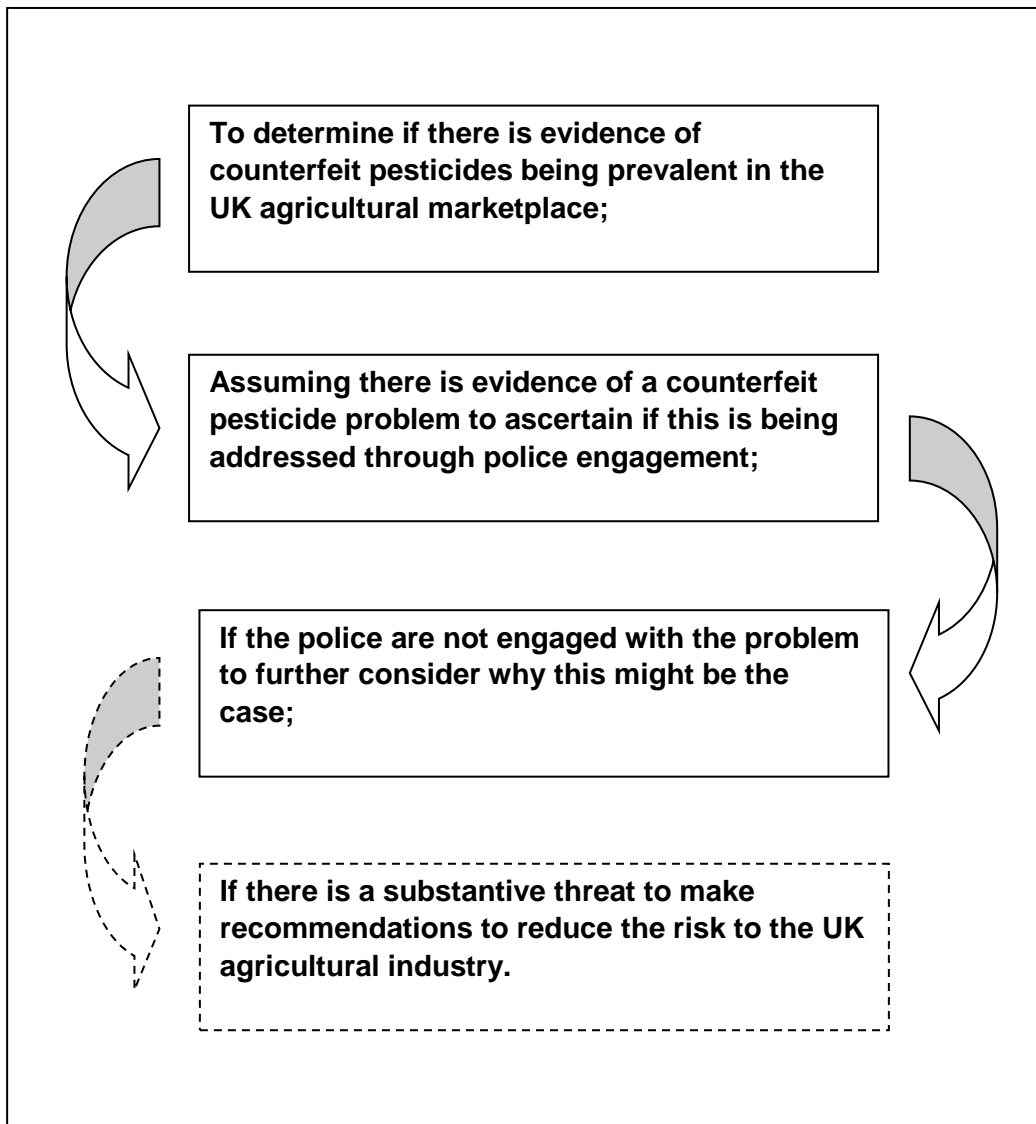
constrained single researcher project, the aim of this study was focused solely on the question prompted by the author's original reading of the Henshaw article; that is to say whether counterfeit pesticides represent a substantive threat to the UK agricultural industry rather than the wider implications of such products entering the UK marketplace (for example the long term environmental or consumer health implications). In this context a 'threat' is understood to be something that is recognisable as being able to exploit a weakness or vulnerability to cause damage or loss, in this case to the UK agricultural industry, and 'substantive' that this threat can be demonstrated if not quantified.

A search of the Police National Legal Database shows that counterfeiting is a crime that is legally complex and characterised by diverse responsibility for enforcing the multifarious legislation and regulation associated with it (PNLD, 2015). Consider, for example, a counterfeit pesticide sold in the UK. Pesticide regulations will have been breached, to be dealt with by the Chemicals Regulation Directorate (part of the Health and Safety Executive), consumer protection offences will have been committed, which will be the concern of Trading Standards, and a fraud will have occurred, to be dealt with by the police. Aside from this there will undoubtedly have been some element of illegality in the importation of the product, suggesting a Revenue and Customs interest, and most probably an offence in transporting an incorrectly labelled hazardous material by ship or road, potentially giving rise to a maritime law enforcement or Department of Transport investigation. Of course these offences are in addition to any civil claim for breach of intellectual property and patent rights that the company whose product has been counterfeited may wish to pursue. Given this level of enforcement complexity, and again to ensure that this was an achievable project, the study also limited its scope to looking solely at the police response to the problem rather than that of other enforcement agencies. The decision to do so was not intended to suggest that the

fraud element of this criminal activity is of greater import than any other offence that may be committed. Rather this reflected a finding of a preliminary review of the literature which suggested that a principle characteristic of counterfeiting is that it is an illicit enterprise that is intrinsically associated with organised crime group (OCG) activity. The police are the primary agency dealing with organised crime and that they should be the focus of research therefore seemed appropriate. It was then these three parameters, that is to say geographical occurrence, specific industry impact, and the police response, that defined the boundaries of the study.

The direction that the resulting research took was the product of two meetings arranged with a view to determining at the outset if the Henshaw article had any foundation, or whether it may be simply journalistic hyperbole. These meetings occurred within a matter of days of each other in June 2013. The first was with senior members of staff with responsibility for UK product security for a major pesticide manufacturing company. The second, reflecting the link to organised criminality suggested by Henshaw, was with police intelligence officers working within a large non-metropolitan police force. These officers had extensive knowledge of OCG activity in both the urban and rural setting. The meeting with manufacturing company subject experts revealed that they had considerable experience of fake versions of their products being produced in the Far East and being shipped to the UK by seemingly legitimate companies, of inadequate regulatory support and an unwillingness on the part of enforcement agencies to engage with the problem, and of significant loss of corporate revenue as a consequence. The meeting with police intelligence officers suggested that they had no knowledge of this crime.

It was this seeming mismatch in awareness of what appeared to be a substantive UK OCG crime activity that prompted the first three study objectives summarised in Figure 1.1. The fourth and final study objective was held in abeyance, it



**Figure 1.1:** Consecutive study objectives

being contingent upon it being found that, in light of the preceding consecutive objectives, there was sufficient evidence to conclude that there is a substantive threat. This final objective, to produce recommendations intended to reduce the risk posed to the UK agricultural industry by counterfeit pesticides, reflected the overall ethos of this

study; that it should be a pragmatic consideration of a potentially significant crime problem.

Whilst the research was guided by these four objectives the seeming absence of previous subject specific research suggested that, within this framework, it would be necessary for the study to be flexible such that it might be modified in response to emerging evidence. Moreover in the absence of an obvious theoretical approach to the subject it was anticipated that, at least in its preliminary stages, the research would progress most easily were it to be grounded in outlook. That is not to suggest that this was a study that set out with the intent of generating theory. Rather it meant that some of the advantages of a grounded approach, notably the adoption of systematic procedures for data collection and analysis, could be utilised to give structure to the study. This allowed an established explanatory theory to be identified in the latter phases to help interpret what had been observed. In practice then the review of the literature and subsequent research design were both conducted in the absence of a guiding theoretical model of criminal behaviour or justice system response. The summary of the thesis that follows reflects this approach.

### **1.1 Summary of the thesis**

The thesis begins with a review of the literature. This serves two functions; firstly to give context to this particular counterfeiting problem, and secondly to determine the extent to which research had addressed the study objectives. The review was cross-discipline in design, a reasonable approach given the absence of any consolidated body of work on the subject of counterfeiting. To overcome the limitations of there also being a lack of academic material relating specifically to counterfeit pesticides the review was also expansive in outlook. It drew upon a mix of sources

ranging from mainstream academic publication, through industry and governmental publication, to media generated content. Use was also made of internet alerts to capture real-time reporting of counterfeit pesticide incidence.

This eclectic mix of source and method is made manifest in the two sections that make up the review. The first of these considers counterfeiting in the wider context, recognising the rapid growth in the problem and the increasingly diverse range of products falling foul of the counterfeiter. This 'scene-setting' section describes four standout themes within the literature; the predominance of China as the source of counterfeit goods including pesticides; the role of the consumer and the numerous elements that together constitute the 'pull factor'; the link between organised crime and large-scale counterfeiting; and the economic, environmental, and human costs of the trade in counterfeit goods.

The second section of the review focuses on counterfeit pesticides, considering what is known about the problem in a global and European context and the evidence for there being a UK problem. This identifies the weakness of industry generated data pertaining to the problem before describing how, despite this weakness, a narrative based on this data has been widely promulgated. The review continues by considering the police and other agency response to the problem, recognising that there is some evidence of enforcement activity in parts of Europe but not specifically within the UK. The final part considers the contribution of criminological studies with regard to understanding this crime problem. The review ends by concluding that although there is a considerable amount of industry generated material and media output concerning counterfeit pesticides there is a near absence of directly related academic research into the problem itself or agency response to it. The study objectives were therefore deemed to represent a significant gap in the literature.

Following this review of the literature the thesis continues by describing how the resulting study was located within the bounds of criminal justice studies rather than criminology, a reflection of its emphasis on the police response to the crime rather than its cause. The lack of an obvious theoretical approach to the research is recognised before acknowledging the contribution of work undertaken by the Intellectual Property Office (IPO) in identifying the weakness of much contemporary counterfeiting research. It also acknowledges its influence over the choice of a convergent parallel variant of the mixed method approach for the data gathering phase. This approach has four distinct steps:

- i. designing qualitative and quantitative research strands and establishing appropriate methods of data collection;
- ii. analysing the qualitative and quantitative data;
- iii. merging the qualitative and quantitative data, and;
- iv. interpreting the merged results.

The thesis then describes the progression through these four steps, beginning with a summary of the various quantitative and qualitative research methods employed in the gathering of data. These methods were chosen for their collective potential to inform the previously stated study objectives and so to achieve a 'blended approach' to counterfeiting research, a strategy endorsed by the IPO in their report as a means of more accurately capturing the nature of any counterfeiting problem. The primary purpose of the qualitative strand was, through a series of stakeholder interviews, to understand the nature of the crime and how it manifests itself in the UK setting. This strand also made use of Freedom of Information Act (FOIA) derived data to determine if police rural policing strategies/policies address this crime problem. A case study of an incident involving a counterfeit pesticide was also included in this qualitative strand.

This gave a victim's perspective of the crime and to provide an example of its occurrence which could subsequently be used as a source of illustration. The quantitative strand of the study examined the relative levels of awareness of the counterfeit pesticide problem amongst police staff and, having hypothesised that this would be relatively low, to ascertain where rural policing is actually focused. This strand of research also considered if, in the data held by public bodies with an enforcement interest in the problem, there is indication of pattern or trend in occurrence of counterfeit pesticides in UK.

Having concluded the first step of the convergent parallel approach the results of each of the various strands of the research are presented. This represents the second step in the research design. It would be fair to say that these results are dominated by the data generated by the twenty-two expert opinions that collectively made up the in-depth stakeholder interviews. That is not to underestimate the value of the data generated by the other research for in the third step in the process, what amounts to an overall summary of the analysed data, the various research strands become mutually supportive and collectively informative. Once merged the data paints a picture of a recurring crime that relies on the systematic abuse of European parallel trading, a regulatory facility that supports the free movement of goods between member states. However, despite this illicit trade being intrinsically associated with organised criminality, it is apparent that this is a crime that is poorly policed.

Turning to interpret the merged results of the research, the fourth and final step in the convergent parallel approach, it is apparent that the collective industry, government, and media reporting of the UK counterfeit pesticide problem is a reasonable expression of the mechanics of this crime. However, what it is equally apparent is that there has been a collective failure to recognise a market dynamic that underpins the problem, and that it is this dynamic that makes undertaking the

mechanics of the crime a worthwhile endeavour for the OCG counterfeiter. Three sources of influence are described; firstly the diverse profile of the UK pesticide marketplace, there being an underlying baseline market for counterfeit pesticides that resides in a comparatively poorly regulated market outside of the core agricultural industry; secondly the response of the legitimate manufacturing industry, not least a pervading emphasis on the need for regulatory change as a means of tackling the problem and a failure to make effective use of collective industry knowledge of the problem; thirdly the narrow focus of rural policing, the consequence of a growing dependence on insurance company data as a benchmark for the success or otherwise of rural policing, to the detriment of the policing of other rural crime such as counterfeit pesticides. These factors combine to produce an operating environment for the counterfeiter, the dynamic, where they can trade with relative impunity. There is a reliable market for their illicit products even when demand from the agricultural market is low, the manufacturing industry response is less than fully effective, and their activities are not being actively policed.

The concluding chapter ends by returning to the aim of the study, determining that counterfeit pesticides do indeed represent a substantive threat to the UK agricultural industry. It is suggested that a means of reducing this threat may be found in adopting policy and practices which are designed to disrupt the dynamic that underpins the UK counterfeit pesticide market. A number of recommendations are made to achieve this disruption, which would make the market place a less attractive place for the counterfeiter to operate, along with an indication as to where the research might now reasonably proceed.

The thesis now continues with a review of the literature, beginning with a summary of how it was carried out.



## 2.0. A review of the literature

*“Though governments as well as management have clearly identified the problem, very little is known – both in practice and theory – about the mechanisms and structure of the illicit market, the tactics of counterfeit producers, consumer behaviour with respect to imitation products and the financial impact on individual companies... the clandestine nature of the counterfeit market limits direct accessibility to the phenomenon. Consequently, the existing body of literature does not necessarily cover all aspects of counterfeit activities.”* (Staake et al., 2009, p.320)

In 2009 Staake et al considered the emergence of counterfeiting as a worldwide crime phenomena, seeking to illuminate the economic principles of counterfeit trade and the describe the underlying illicit supply chains. In bringing together previous research on the subject for fresh analysis they undoubtedly advanced the collective knowledge on the subject. Most significantly, and in particular in terms of this thesis, they highlighted an important emerging trend in the modus operandi of this illicit trade that has, in the relatively short time that has elapsed since the review was carried out, become firmly entrenched. Counterfeiters are no longer just targeting luxury items but are diversifying into non-luxury markets such as pharmaceuticals and automotive parts. Highlighting this characteristic certainly contributed to a wider appreciation of the contemporary pattern of counterfeiting activity. However, it could be argued that the true significance of Staake et al was not in noting the shifting nature of this illicit trade but in recognising the limited scope of the research that had been carried out into this phenomena up until that point. Whilst acknowledging the obvious problems faced by researchers, working on a subject where the clandestine nature of the market severely hinders accessibility to usable data, Staake et al highlighted a number of shortcomings. Notable amongst these was that there had been little research carried out into the

potential impact of the counterfeit trade on specific business sectors. This was despite estimates that the cost in terms of lost profit and tax revenue is estimated to be in the order of £1.3 billion in the UK alone (Harper, 2013).

This review begins with an overview of the worldwide counterfeiting problem. It continues by considering whether, despite the findings of Staake et al, there is a recognisable body of work concerning counterfeit pesticides and the evidence for there being a substantive UK problem. It then reflects upon the contribution of criminological studies toward understanding the problem and the enforcement, and more specifically police, response. The review concludes by considering the extent to which the study objectives have been previously addressed and drawing conclusions as to the need for further research.

## **2.1 Definitions**

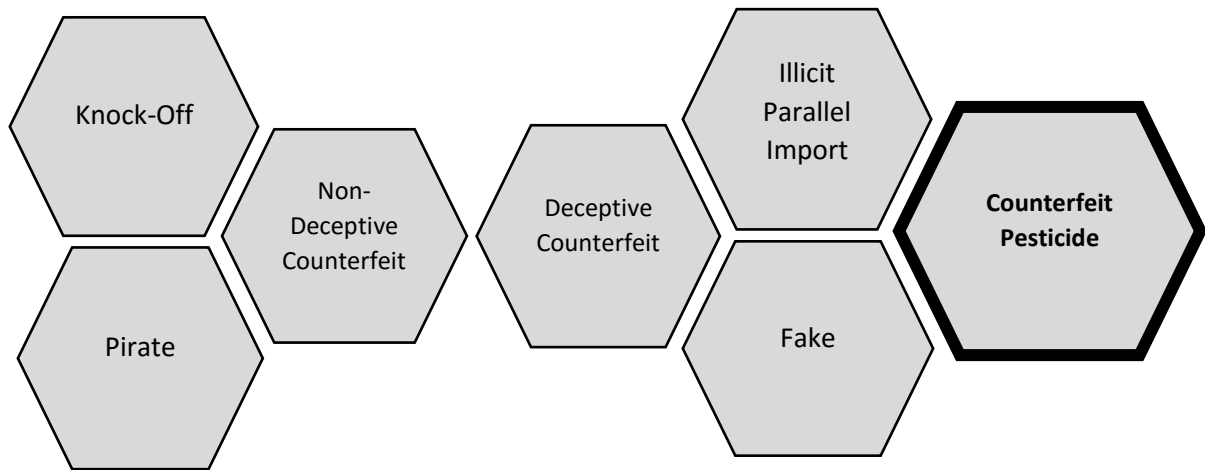
In the context of this study 'pesticide' is taken to have the same meaning as the phrase 'plant protection product'. This in turn is taken to have the meaning defined by the Chemicals Regulation Directorate (Health and Safety Executive, 2014), this being products in the form in which they are supplied to the user, consisting of, or containing active substances, safeners or synergists, and intended for one of the following uses:

- a) protecting plants or plant products against all harmful organisms or preventing the action of such organisms, unless the main purpose of these products is considered to be for reasons of hygiene rather than for the protection of plants or plant products (e.g. fungicides, insecticides);
- b) influencing the life processes of plants, such as substances influencing their growth, other than as a nutrient (e.g. plant growth regulators, rooting hormones);

- c) preserving plant products, in so far as such substances or products are not subject to special community provisions on preservatives (e.g. extending the life of cut flowers);
- d) destroying undesired plants or parts of plants, except algae unless the products are applied on soil or water to protect plants (e.g. herbicides/weedkillers to kill actively growing weeds);
- e) checking or preventing undesired growth of plants, except algae unless the products are applied on soil or water to protect plants (e.g. herbicides/weedkillers preventing the growth of weeds).

Counterfeiting, as previously defined in the introduction to the thesis, is a category of crime that is littered with ambiguous phraseology and what might be considered slang words. In addition many of the frequently used terms are interrelated and sometimes liberally substituted for each other in the literature. In an attempt to make sense of the relationship between these various terms Figure 2.1 shows how the most commonly used terms are clustered as an overall counterfeiting nomenclature. At the same time the figure illustrates how some terms have a close relationship with others within the cluster and a less close relationship with the remainder. For example the term *Deceptive Counterfeit* is closely associated with *Fake* but less closely associated with *Pirate* (the first being a term used to describe a type of deceptive counterfeit and the second a non-deceptive variant). The subject of this study, *Counterfeit Pesticides*, is shown in its relevant position at the periphery of this cluster; that is to say it is closely associated with *Deceptive Counterfeits* and *Illicit Parallel Imports* but not with *Knock-Off* or *Pirate* goods. Each of the words used in the cluster is defined in Table 2.1, specifically in the sense they are understood in the context of this study. Understanding this relationship between descriptive terms, and in particular those most closely associated with counterfeit pesticides, will help the reader to better

understand the complex nature of counterfeiting. It will also help in appreciating why particular subject areas feature more strongly than others in the review.



**Figure 2.1:** Key counterfeiting terms used in the study showing their relative association.

## 2.2 Review method

In considering an appropriate method of review what follows owes much to the fact that the history of counterfeiting as a discreet subject of academic study is a relatively short one. This is unsurprising, given that the dramatic expansion of this transnational crime problem is a relatively recent occurrence<sup>2</sup>. This has two significant implications; firstly there is no consolidated body of knowledge on the subject. Secondly, and quite possibly as a consequence of the first, there is a considerable time lag between emerging trends and the recognition of the same in peer reviewed material.

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<sup>2</sup> This is not to suggest that counterfeiting is in any way a new crime phenomenon. The trade in fake goods, for example olive oil, goes back at least to the time of the Romans (Mueller, 2012) and given that evidence of the trade has been found across the geographical span of their Empire this might reasonably have been described as a transnational crime.

**Table 2.1:** Definitions of key counterfeiting terms

<b>Counterfeiting Term</b>	<b>Definition</b>
<b><i>Deceptive counterfeit</i></b>	An item purchased or acquired by a consumer where they are not aware that it is not genuine.
<b><i>Non-deceptive counterfeit</i></b>	An item purchased or acquired by a consumer where they are aware that it is not genuine.
<b><i>Fake</i></b>	A widely used term generally accepted to mean a deceptive counterfeit.
<b><i>Knock-off</i></b>	A commonly used colloquialism generally accepted to mean a non-deceptive counterfeit.
<b><i>Pirate goods</i></b>	Describes copyrighted works that have been reproduced without the permission of the copyright holder. Such goods may be deceptive or non-deceptive counterfeits.
<b><i>Illicit parallel import</i></b>	A product imported into an EU member state from another member state, under the terms of parallel trade procedures, which does not meet the criteria for it being authorised for placing on the market and use in the country from which it is purchased and/or it is not identical to one that is already authorised for placing on the market and for use in the UK. When sold to an unwitting consumer it can be considered to be a deceptive counterfeit.
<b><i>Counterfeit pesticide</i></b>	A plant protection product which pertains to be a genuine item authorised for use in the UK by the Chemicals Regulation Directorate (CRD) but is not.

To address the first of these implications the review is cross-discipline in design, drawing on academic writing on the subject from a variety of different sources. Much of this work, which includes for example psychology, business and marketing, and economics, is niche in perspective. However, if considered in totum it contains much to further understanding of the subject in a criminal justice context. The time lag issue was overcome by including within the review reports and analysis produced by industry associations, government departments, and specialist non-governmental organisations with a specific commercial or law enforcement interest in the subject. Given that this so called 'grey' literature is often the precursor to academic study, and indeed is often used as a source of primary data, this was deemed to be a reasonable and pragmatic approach. Moreover, and given the rapidly evolving nature of the subject, it was also deemed appropriate to use media reporting of incidents and enforcement initiatives as a means of identifying emerging patterns or trends.

The first part of the review, that is to say the introduction to the subject of counterfeiting, reflects the authors wide ranging reading of the subject over a two year period. This might be described as a constrained snowball approach to the literature, the focus being on the keywords given in the subject nomenclature. The starting point for the second part of the review, which looks at the counterfeit pesticide problem, was a structured search of relevant electronic databases; EBSCOhost (Business Source Complete; Criminal Justice Abstracts), Web of Knowledge (Social Science Citation Index), JSTOR (Business and Economics; Social Sciences), ProQuest and LexisNexis. The search criteria applied was as summarised in Table 2.2. Each of the key words given in the two primary search term lines were combined in turn with each word contained within the subsequent search set(s) these reflecting broad review areas. For example the word *Counterfeit*, from the primary search term line, was combined with each of the words in sets 1-3 in turn. The key words from the second primary search

term line (for example *Pesticide*) were combined with each of the words in set 4 only. Wildcard and combined searches were as indicated. This process was applied in turn to each of the databases used.

**Table 2.2:** Summary of the electronic database search criteria.

Counterfeit	Fake	'Knock-Off'	Pirate	'Parallel Import'
<b>Set 1</b>		<b>Set 2</b>		<b>Set 3</b>
+ Pesticide		+ Agricultur*		+ Crime
+ Spray*		+ Horticultur*		+ Criminal*
+ Fungicide		+ Farm*		+ Offence
+ Herbicide		+ Rural*		+ Law
+ Insecticide				+ Legislation
Pesticide	Spray	Fungicide	Herbicide	Insecticide
<b>Set 4</b>				
+ Crime				
+Criminal				
+ Offence				
+ Law				
+ Legislation				
+ 'Parallel Import' + illegal and/or illicit				

This search method was also used for a more general internet search, seeking those government, industry and specialist organisation reports previously discussed to give depth to the review. This proved to be effective. However, given the dynamic nature of incident reporting such a 'single-hit' approach was considered less appropriate for identifying relevant media coverage of the subject which, by the very nature of online reporting, is more transient in nature. In recognition of this a series of online alerts were designed and run to capture relevant news reporting in close to real-time. These alerts were less expansive than those used for the electronic journal and

report searches because what was being sought was very specifically the reporting of counterfeit pesticide incidents rather than any wider comment or analysis. A summary of the alert criteria used can be found at Table 2.3.

**Table 2.3:** Summary of the online alert search criteria relating to counterfeit pesticides.

Counterfeit	Fake	'Knock-Off'	Pirate	'Parallel Import' + illegal and/or illicit
<b>Set 1 – above +</b>				
+ Pesticide				
+ Spray*				
+ Fungicide				
+ Herbicide				
+ Insecticide				

Online alerts provide a means by which a continuous search of the internet may be conducted over a defined time period, in this case the eighteen month period from January 2013 to January 2015. The resulting alerts were then reviewed and filtered for relevance and items from non-established media outlets were discarded. Any indication of counterfeit pesticide incidents was followed up using a stand-alone internet search using whatever information the source article provided. Again the results of these searches were filtered according to relevance and source credibility.

The results of all searches, including online alert derived material, were subsequently analysed using proprietary Qualitative Data Analysis (QDA) software. The constant comparison method of analysis described in section 4.2.1 of the thesis was used to identify the primary and subsidiary themes. These themes then provided the structure to the review that now follows.



### **2.3 Setting the scene; counterfeiting as a worldwide crime problem**

*“The magnitude and effects of counterfeiting and piracy are of such significance that they compel strong and sustained action from governments, business and consumers”.*  
(OECD, 2008, p.13)

Having recognised in the introduction to this review a lack of depth in writing which addresses the impact of counterfeiting on specific business sectors it would be fair to say that, by contrast, there is a much more robust body of work describing the wider significance of this illicit activity. In particular there is a sustained strand, largely generated by non-governmental organisations (NGOs), which is concerned with its growing international economic impact (OECD, 2008; World Intellectual Property Organization, 2009). Some of the most comprehensive and arguably most authoritative of these reports are now a number of years old. However, more recent strategic analysis, which has a greater emphasis on the criminal aspects of the problem, suggests that the problem has continued to grow and that there is unlikely to be a reduction in this expansion in the foreseeable future (National Crime Agency, 2014).

In considering what underpins this growth the early part of the twenty-first century saw the convergence of a number of factors which have collectively served to create a comparatively benign operating environment for counterfeiters. Firstly, rapidly evolving manufacturing technologies have enabled them to reverse engineer and subsequently to mass produce convincing copies of genuine items (Endeshaw, 2005; Minagawa et al., 2007). Secondly the evolution of digital mobile communication and the internet has brought together, at least in a virtual sense, illicit manufacturer, distributor and buyer. This has provided a variety of means by which the proceeds of the consequential crime can be legitimised (Levi, 2008; World Intellectual Property Organization, 2009; International Institute of Research Against Counterfeit Medicines, 2013; Robbins, 2013; United Nations Office on Drugs and Crime, 2013). Finally the

ease with which goods can be transported across national borders, especially within the European free internal market, means that the movement of counterfeit goods is not constrained to anything like the extent it once was (Vithlani, 1998).

The literature is relatively plentiful on the subject of cause. However, comparatively few of those concerned with explaining the growth in counterfeiting have considered the global economic imbalance which some have suggested might be the primary but overlooked driving force behind the world trade in such goods (Palombi, 2007). That is not to say that it is entirely ignored. A number of analysts, Palombi (2007) included, believe that it is highly significant that resources and manufacturing knowledge are centred on the developing world whilst the majority of intellectual property is owned by the developed world.

Aside from such structural influences, and considering much shorter term global economic determinants there is some evidence to suggest that the recent rapid growth in the counterfeit problem has, somewhat paradoxically, been encouraged by a worldwide economic downturn. This downturn may have had a significant negative impact on many legitimate businesses but seemingly not on the counterfeiter. Whilst their illegal enterprises mirror the organisational sophistication of their legitimate counterparts (Hetzler, 2002; Williams & Godson, 2002) they are free from much of the normal cost of enterprise such as research and development or compliance with regulatory regimes (World Trade Organization, 1994; FTI Consulting, 2013). Moreover it would seem that the same economic pressures have stimulated a market with an increasing willingness on the part of consumers to accept the risks associated with acquiring goods they know not to be genuine (Rutter & Bryce, 2008; Barnato, 2013)<sup>3</sup>. Taken together these factors have seemingly prompted a rapid diversification of the

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<sup>3</sup> The role of the consumer in the growth of the market for counterfeit good is discussed at section 2.3.2 of the thesis.

counterfeit market. It now includes much more than the mainstream luxury items which have historically been the bedrock of the trade (Stewart et al., 2007). There is now no apparent limit to what can, and is, counterfeited. From pharmaceuticals to safety critical aircraft parts few, if any, industries have been immune from the problem (Phillips, 2007).

The consequence of this benign and arguably nurturing environment for the counterfeiter has been a crime-wave that has been estimated to be worth something in excess of 2% of total world trade (World Intellectual Property Organization, 2009). It seems somewhat surprising then that this could hardly be described as a headline crime. Perhaps more accurately it might be said that it is not a headline crime in those countries where its impact as a proportion of total economic activity is relatively modest (OECD, 2009). That is not to say that the cost to both national economies and businesses is not well recognised and documented (World Intellectual Property Organization, 2009). Rather it would seem that in the majority of countries, for example the UK, there is a baseline level of counterfeiting activity which has become essentially normalised. This is a crime that goes largely without popular comment, at least until such time as a counterfeiting incident occurs which, for whatever reason, causes widespread consumer alarm. This was certainly the case in the UK in 2013 with the so called 'horse-meat scandal' (Lichfield et al., 2013)<sup>4</sup>.

There is much to support the view that counterfeiting has undergone a rapid growth in terms of both volume and diversity. Out of this emerges four strands that stand out to the extent that they deserve individual consideration; the significance of China as a source of counterfeit goods, the extent and implications of consumer

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<sup>4</sup> In the 2013 meat adulteration scandal that had an impact across Europe foods advertised as containing beef were found to contain undeclared or improperly declared horse meat. The scandal has been variously described but at its core it was a case of repeated counterfeiting.

complicity, the link between this illicit trade and organised crime groups, and the economic, environmental, and human costs of the trade in counterfeit goods. Each of these strands will now be reviewed in turn.

### **2.3.1 China as a source of counterfeit goods**

Writers on the worldwide counterfeiting problem frequently cite China as being the source of the majority of counterfeit goods. It has been suggested that there is an intrinsic relationship between this criminal activity and the state (see for example Mertha, 2007; Dimitrov, 2012). Some analysts have estimated that China is the origin of something in the order of 75% of all counterfeit products traded annually worldwide (Stewart et al., 2007; FTI Consulting, 2013; United Nations Office on Drugs and Crime, 2013). This generalisation would seem to hold good for counterfeit plant protection products. The industrial city of Jintan, located in Jiangsu province in the south of the country is cited as being a production hot-spot (CropLife International, 2006; Rowe, n/k). The proximity of this industrial centre relative to the known counterfeit export routes of Taiwan and Hong Kong is likely to be a significant factor in its link to counterfeit chemicals (Chow, 2003). However, whilst the finger of blame is generally pointed toward China some have questioned the legitimacy of the frequently repeated discourse of the 'Chinese pirate'. Writers identify evidence that the authorities there are increasingly willing to acknowledge their country's key role in the worldwide counterfeiting problem (Pang, 2008). They offer as evidence regular and widely reported initiatives being launched to demonstrate to the wider business community that the problem is being taken seriously (CropLife International, 2011a; China Daily, 2013). These anti-counterfeiting activities include the targeting of fake agricultural products, such as counterfeit pesticides, and have prompted qualified public

recognition from the legitimate agrochemical industry (CropLife International, 2009b; Pakistan Today, 2013; Xinhua News Agency, 2013).

Although at state level the Chinese are increasingly inclined to recognise the problem some writers and agencies suggest that, despite governmental acknowledgement, it will not be tackled quickly (New York Times, 2007; National Crime Agency, 2014). Various reasons as to why this should be the case have been proposed, dominant amongst these being that traditional Chinese beliefs do not conform to Western notions about the ownership of inventions and ideas (Zimmerman, 2013). A number of authors on Information Law, Endeshaw included, have proposed that social and cultural factors across Asia make the enforcements of intellectual property rights inherently problematic. Copying the work of others is not regarded as a questionable practice (Endeshaw, 2005). This cultural barrier manifests itself in the form of business practices which make it difficult for enforcement agencies to gather sufficient evidence to secure a conviction. Offenders reportedly do not keep their products on-site, refuse to deal with anyone they do not know personally (Levin, 2013), or adopt decentralized manufacturing methods that circumvent local anti-counterfeiting regulations (United Nations Office on Drugs and Crime, 2010). Others have highlighted that even when anti-counterfeiting legislation and regulations are successfully applied they carry comparatively light financial penalties and do little to deter the determined counterfeiter (CropLife International, 2006; Zimmerman, 2013). Typically penalties under Chinese law for the possession of counterfeit goods are based on the value of material seized. Provided the trafficker ensures that shipments are split into relatively small consignments then the financial consequences of being caught are relatively modest (United Nations Office on Drugs and Crime, 2010). This inability to make any prosecution inroads into this illicit trade may, when taken alongside a suggested degree of official corruption (CropLife International, 2006), explain why some

commentators on the Chinese counterfeit phenomena have argued that there is a general unwillingness on the part of local enforcement agencies to pursue offenders. This essentially leaves legitimate companies to build their own prosecution cases if they are determined to achieve legal redress (Minagawa et al., 2007).

This writing carries a strong suggestion that legitimate manufacturers are, more often than not, entirely isolated in their quest to protect their IP rights. Perhaps inevitably in the context of an economy that is in a state of transition (Endeshaw, 2005) despite public acknowledgement of the problem there appears to be little sympathy on the part of Chinese officials for the Western sensibilities of legitimate manufacturing companies (Phillips, 2007). It is a situation seemingly exacerbated if claims that the activities of the World Trade Organisation (WTO) has done little to bridge the gap between the developed and developing world are correct (Palombi, 2007). However, such comments need to be considered in light of previously discussed comments that Chinese attitudes are changing. There are some who believe that, as the country gradually becomes less reliant on importing foreign technologies and cheap manufacturing and moves toward a more innovative economy, it will become increasingly respectful of intellectual property rights (Wells, 2013).

Whilst seeking to address the source of production is potentially an important factor in tackling the overall counterfeiting problem it is not necessarily the complete answer. Others highlight what is essentially the opposite side of the equation as being an equal if not more significant factor in the growth of counterfeits; consumer complicity in the problem through buying habits that encourage the production and distribution of fake products. The role of the consumer will now be considered.

### **2.3.2 The role of the consumer in the growth of the market for counterfeit goods**

If the literature reviewed in the previous section on the role of China in the world trade in counterfeiting implied that the problem was primarily a function of so called 'push' factors then there is an equally robust body of work which presents the counter-perspective<sup>5</sup>. Primarily derived from research within the spheres of business management and the psychology of consumer behaviour an alternative view is proposed; that the rise of the counterfeit can be largely attributed to consumer demand or 'pull' factors. It is interesting to note how often it is claimed that consumer complicity in the market for counterfeit goods has not been thoroughly researched and is poorly documented (see for example Chaudhry & Stumpf, 2011; Thorsten Staake et al., 2012). However, the results of this review suggest that this may be consequential to a failure to take a sufficiently broad view rather than a general weakness in the overall body of work. By taking a cross-discipline approach a number of themes emerge. Together these amount to a useful summary of the key strands in contemporary thinking on what drives consumer demand for counterfeit goods.

Contrary to the belief that prevailed at the start of the current boom in counterfeiting, that for most consumers the possibility that a product may be counterfeit never occurs to them (Bamossy & Scammon, 1985), it is increasingly apparent that consumers are sophisticated decision makers who are capable of recognising a fake product (Chaudhry et al., 2009). Moreover those that have considered consumer complicity in the trade in counterfeit goods suggest that typically a third of consumers would knowingly purchase such products (Tom et al., 1998). This would imply a conscious decision to engage, and indeed other sources support this view. However, there is little consensus as to the relative weight of each influencing factor. Foundation

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<sup>5</sup> The significance of push and pull factors in theory of crime terms is discussed in section 2.4.4

work into consumer behaviour with respect to counterfeit goods indicates that price is a recurring and essentially non-disputed element (see for example Tom et al., 1998; Albers-Miller, 1999; Kim et al., 2009). It would also be fair to say that in moving beyond this seemingly obvious influence an increasingly complex blend of factors begins to emerge. Some of these are inevitably linked to price, notably income (Stumpf et al., 2011) and individual materialism (Furnham & Valgeirsson, 2007). The remainder suggest a complex but largely subconscious process wherein consumers are not necessarily looking for a counterfeit product but rather are looking to satisfy a need (Stumpf et al., 2011).

Predominant amongst these factors is the perceived quality of the counterfeit product, to the extent that willingness to buy increases in parallel with how well it compares with the original (Chaudhry & Stumpf, 2011). That is to say that a consumer will, to some varying extent, have a perception of the quality and the somewhat indistinct concept of the brand personality of the genuine item (Bian & Moutinho, 2009), and the corporate image of the manufacturer of that product (Penz & Stöttinger, 2008). Bian and Moutinho (2011) have suggested that these factors, when combined with product knowledge (in the sense of appreciating the unique features of the original) are key to understanding purchase behaviour in relation to counterfeits.

These concepts of brand and corporate image are often nebulous in the way they are described. Nonetheless they are seemingly important for they are often reflected in those studies that consider how consumers navigate the risks associated with the purchase of counterfeit goods (Penz et al., 2008). Consumer involvement with a brand translates into trust, and it is by building brand trust that legitimate manufacturers encourage risk aversity amongst their consumer base (Matos et al., 2007). However, and as has already been noted in considering what proportion of individuals will knowingly buy counterfeit products, the strategy is not universally



successful. Certainly it has been recognised that once a customer starts buying fake products, and assuming their experience is that any reduction in product quality is more than compensated for by cost saving, any residual averseness dissipates (Matos et al., 2007; Penz et al., 2008). Moreover it has been suggested by some, for example Chaudhry and Stumpf (2011), that one of the strongest predictors of consumer complicity with counterfeit goods is the personal pleasure to be found in buying them. These writers imply a potential consumer attitudinal shift from fear toward pleasure in acquiring counterfeit goods once a positive experience has assuaged any concerns associated with the potential risks that legitimate manufacturers may have promulgated.

Interestingly, and importantly in the context of this study, there is an indication these generalisations about consumer willingness to take risk may not be consistent across product groups. There is, for example, much less inclination toward knowingly buying counterfeit pharmaceuticals or automotive parts, products where the consequences of failure are potentially far more serious, than there is, for example, in buying non-genuine clothing or watches (Penz & Stöttinger, 2008). Similarly complicity varies across and within consumer groups and, as one might expect, individual honesty plays an important role. Moral judgement has a direct influence over purchase intent (Kim et al., 2009) as does fear of punishment (Penz & Stöttinger, 2005). Such individual factors, which would also include perceived image in the sight of significant others (Bearden et al., 1989) or the influence of professional advice when making strategic high value buying decisions, have been noted particularly in the context of the professional purchase decision making process within the agricultural industry (Agricultural Industries Confederation, 2013).

The study of consumer complicity with counterfeit products is well served, albeit it is spread across a number of disciplines and is far from consistent in its view as to

what the most important influencing factors are. However, one point that is seemingly overlooked is the extent to which there is a lack of concern on the part of consumers about the link between counterfeiting and organised crime<sup>6</sup>. As Bullock et al. (2009) describe crimes that are 'organised' by definition, selling counterfeit goods included, do not generate concern amongst the public in the same way that crimes such as burglary or vehicles crimes do. Nonetheless whilst this factor is largely absent from consumer orientated research it does feature more prominently in other writing.

### **2.3.3 The link between counterfeiting and organised crime**

Research that implicates an ability to mass produce counterfeit goods or consumer willingness to buy them as causal factors are insufficient fully explain the extent of the current counterfeit problem. It is only on examining the body of work that describes how the juncture of these factors is exploited by Organised Crime Groups (OCGs) that it becomes apparent how, and why, there has been a rapid growth in this crime problem. The link between OCGs and counterfeit goods is well established and is a common theme within a broad cross-section of writing associated with the subject (see, for example Lowe, 2006; FTI Consulting, 2013; International Institute of Research Against Counterfeit Medicines, 2013). Indeed it has been suggested that the growth in counterfeiting as a worldwide crime problem has been driven more by the activities of OCG counterfeiters than any other factor (Stumpf et al., 2011). However, the extent to which this link has been properly explored is open to question, particularly given that

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<sup>6</sup> Organised crime is variously defined but for the purposes of the study the definition used by the UK National Crime Agency is utilised. Organised crime is therefore defined as serious crime planned, coordinated and conducted by people working together on a continuing basis. Their motivation is often, but not always, financial gain. Organised criminals working together for a particular criminal activity or activities are called an organised crime group (OCGs).

some have described the whole genre of organised crime as still being poorly represented in the literature (Hall, 2013).

This implied weakness may have some foundation. Whilst there have been numerous popular texts on the classic crime gang and the gangster (see for example Thompson, 2005) there has been much less written about the evolution of those Mafia style gangs which by and large only exerted local influence into OCGs that are run like sophisticated and modern multi-national businesses (Cabinet Office Strategy Unit, 2009; Varese, 2013). That said the available literature is still enlightening. For example Hetzer (2002), when describing such groups, suggested that organised crime is more akin to a shadow economy and that this may be an extreme example of capitalist accumulation. Indeed this focus on capital accumulation rather than local influence and status is increasingly reflected in national strategic assessments of OCG activity (National Crime Agency, 2014).

Considering the overall tenor of the literature it seems that part of the problem with addressing the activities of OCGs, both academically and practically, has been this very problem; an increasingly blurred line between organised crime and legitimate business and the increasing propensity for them to be one and both at the same time (Spink, 2011; Levi, 2014). Nonetheless by taking a cross-discipline approach to the question of why counterfeiting should be such an important element of the illicit business portfolio of many OCGs it was possible to isolate two noteworthy factors. Firstly there is a firm link back to the extent of consumer complicity previously considered in this review. A willingness to step outside of established supply channels readily exposes consumers to the activities of OCGs and creates a market place where fake products can be sold at high profit (Catizone, 2006). Secondly an unwillingness on the part of governments or local enforcement agencies in what might be described as 'victim countries' to actively engage with matters of intellectual property means that

counterfeiting represents a low risk activity to OCGs (see for example Williams & Godson, 2002; Phillips, 2007; Staake et al., 2009; Fink et al., 2010; Coyne & Bell, 2011; The Anti-Counterfeiting Group, 2013).

The high profit, low risk nature of counterfeiting as a crime opportunity is an often quoted maxim that regularly occurs in academic studies and business reports as well as media coverage of the problem (FTI Consulting, 2013). The profit element of the equation is largely self-evident; these groups are trading high volume and often high value goods, this to the extent that some have suggested that this activity is now as profitable to them as illegal drug trafficking (see for example FTI Consulting, 2013). At the same time the risk of being caught let alone prosecuted is perceived as being very low, largely the consequence of there being demonstrably poor rates of incidence reporting to the police or other enforcement agencies (Tilley & Hopkins, 2008). As a result counterfeiting is seen by OCGs as a soft crime (National Crime Agency, 2014), that is to say one where they can exploit the unregulated gaps in enforcement with relative impunity. As Coyne & Bell (2011) describe they can respond quickly and avoid unnecessary risk. It would seem then that OCGs have recognised that humdrum crime is safer (The Economist, 2014).

This lack of enforcement agency engagement with the counterfeiting problem must be seen in the context of wide recognition that the illegal revenue from this trade supports secondary OCG activities (United Nations Office on Drugs and Crime, 2015). Often these are crimes which rank much higher in enforcement priorities and which in total are estimated to generate \$870 billion a year (United Nations Office on Drugs and Crime, 2015). It has been suggested, for example, that the proceeds of counterfeiting activity have been used to fund the importation of illegal drugs, the trafficking of people into modern day slavery (Fink et al., 2010), and to support terrorist activity (Lowe, 2006; Heinonen et al., 2012). Whilst the validity of this last association has been

questioned by some (see for example Harris, 2005; Phillips, 2007) seen in the context of a global upsurge in terrorist activity (Ellis, 2015) such a link cannot be dismissed. It remains a possibility, however, that a failure to give a higher priority to counterfeiting is not the result of enforcement agency ignorance of the problem<sup>7</sup>. Rather there is a lack of public concern. It has been suggested that it is generally not recognised that the revenue generated by counterfeit products is used to fund other types of potentially even more harmful organised crime (Bullock et al., 2009, p.1).

It has already been noted that, as a general observation, organised crime is poorly represented in criminological writing<sup>8</sup> (Hall, 2013). This weakness is particularly evident with regard to describing how OCGs operate at a practical level. Whilst it is recognised that they have a global influence, and indeed given the opportunities presented by easy travel and rapid communication systems their activities may be considered to be more dependent upon opportunity than upon location (Levi, 2008), no study in the public domain has been identified which comprehensively describes the modus operandi of an OCG that is active in the counterfeit market. That said it is possible to glean a number of key characteristics of their structure, operational practices, and prevalence from recurring themes within the available literature, primarily from government or agency sponsored reports and analysis.

Organised crime groups are, by definition, organised (Cabinet Office Strategy Unit, 2009; Pottenger, 2013; Secretariat of the Directorate General Human Rights and Rule of Law, 2013). However, any suggestion that this implies a static organisational

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<sup>7</sup> To accuse policy makers and national policing bodies of being entirely disengaged with the counterfeiting problem would be unfair. Whilst it has not attracted widespread coverage or comment this review recognises the establishment of The Intellectual Property Office within City of London Police, which is the National Lead Force for fraud (Department for Business, Innovation & Skills, 2013).

<sup>8</sup> Theoretical approaches to organised crime are discussed in section 2.4.4 of this review.

structure is refuted (Levi, 2014). Typically such groups are rather dynamic, often relying on relatively loose associations (United Nations Office on Drugs and Crime, 2010; Coyne & Bell, 2011; United Nations Office on Drugs and Crime, 2013) and that they can repeatedly reform to take advantage of specific opportunities wherever, and whenever, they might arise (Levi, 2008; Cabinet Office Strategy Unit, 2009; Spink, 2011, Braun & Maurin, 2013). Moreover this flexibility allows them to be involved in the counterfeiting process from manufacturing, through distribution and ultimately sale of the product (FTI Consulting, 2013). Such groups are seemingly numerous. The 2013 Europol Serious and Organised Crime Threat Assessment expressed concern about the growth of OCG activity within Europe, making specific reference to the scale of counterfeiting activity (Europol, 2013). Recognising yet again the attractiveness of counterfeiting to OCGs, because it is seen as a low risk and high profit activity, the analyses estimates that at the time of the report there were 3,600 such groups active in the European Union. Turning to consider UK analyses of the same issues the National Strategic Assessment of Serious and Organised Crime concurs with the European analyses in that it also suggests that the problem is growing (National Crime Agency, 2014). In terms of their impact it has been separately estimated that the total cost to the UK economy of OCG counterfeiting activity is somewhere between £20 and £40 billion a year (HM Government, 2010).

This review has previously described a widespread unwillingness at the state level to intervene in matters of intellectual property right enforcement. However, arguably this unwillingness is paradoxical given the demonstrable link between organised criminality and the trade in counterfeit goods. A failure to adequately engage with the national counterfeiting problem is seemingly at odds with a clear intent on the part of the UK Government to address the problem of OCGs (HM Government, 2011a) made manifest in the establishment of the National Crime Agency, which has been

tasked with addressing organised criminality in the UK as a priority (HM Government, 2011b). Some have described the establishment of this Agency as a tacit admission of a failure on the part of the Government to thus far come to terms with the OCG problem and that fighting organised crime has generally taken second place to tackling the threat from international terrorism (Royal United Services Institute). Nonetheless it seems that, by a somewhat circuitous route, the UK Government has now put in place the means by which it may address the demands of the Organisation for Economic Co-operation and Development, cited at the head of this overview, for sustained action to tackle the counterfeiting problem (OECD, 2008, p.13).

#### **2.3.4 The economic, environmental, and human costs of the trade in counterfeit goods**

Given that the literature is indicative of the relationship between counterfeiting and OCGs being manifestly at the centre of a serious crime problem it might reasonably be hypothesised that it would also be a feature of criminological and criminal justice research. However, and has been previously noted in this review, those who have previously considered the body of work relating to counterfeiting have suggested that these are disciplines whose academic contribution to the subject has been noticeable by its near absence. Heinonen et al. (2012), for example, have gone as far as to suggest that there is no clear understanding of product counterfeiting from a criminological perspective. This lack of engagement may be indicative of the methodological problems associated with researching organised crime. As Abadinsky (1981) has noted such criminal activities are concealed from public view and that much of what we learn is gleaned from indirect sources. What is perhaps much more surprising is that those researchers who consider the victim's perspective (victimology) have similarly failed to engage with this subject, even though material might be more

accessible. That said there is a significant body of victim centred comment on the economic, environmental and human cost of the trade in counterfeit goods, albeit not within the criminological canon.

The likely scale of the worldwide counterfeiting problem and its cost to the world economy has been a matter of continuing concern to the Organisation for Economic Co-operation and Development (OECD). In 2008 this major international economic organisation published a wide ranging report into the global problem, within which it was estimated that the international trade in counterfeit goods could be worth as much as USD 200 billion in 2005 (OECD, 2008). Subsequent reports, building on this original analysis, have confirmed that this trade has grown rapidly over recent years with one specialist industry study estimating that it will be worth between USD 770 billion and USD 960 billion by 2015 (Frontier Economics Ltd, 2011, p.5). However, whilst such macro-data is probably useful for estimating the broader economy-wide consequences of the trade, and they certainly give an indication of the growing scale of associated worldwide criminal activity, it does not illuminate how this problem is experienced by individual manufacturing companies. From such all-encompassing estimates it cannot be appreciated, as the original OECD report recognised, that there are multiple impacts including upon sales volume, prices, and brand value (OECD, 2008). Moreover these figures do not give any meaningful indication of the more tangible consequences of this trade, for example the environmental damage that it is believed to cause.

The criminologist Professor Michael Levi (2014), when considering perceptions of organised crime in a discussion piece for the Royal United Services Institute, recognised that the harms caused by the activities of organised crime groups are likely to far exceed the benefits to the offenders. Levi cites the dumping of toxic waste as a good example of an inevitable consequence of many counterfeiting activities. Moreover



the use of the finished counterfeit item can have equally serious environmental consequences. It is worth considering the example given by Kenaway in his comprehensive analysis of the impact of counterfeit goods in Egypt where he notes documented cases of counterfeit fertilizers causing much damage to the environment (Kenaway, 2013). Beyond the obvious long term implications of such environmental damage there is of course a much shorter term, and very direct, threat to the wellbeing of people exposed to counterfeit goods.

The World Intellectual Property Organization (WIPO) have been very vocal in highlighting the direct health threat posed by fake goods. In a WIPO press release which coincided with a subject specific congress hosted by Interpol they claimed that the transnational organised crime groups behind the world trade in counterfeit goods commit these crimes with no thought for the potentially deadly effect of their products (World Intellectual Property Organization, 2009). There would seemingly be evidence to support this claim, in particular relating to the counterfeiting experience of the pharmaceutical industry which is often cited as an example (see for example Catizone, 2006). It is not surprising given its inherent scientific leaning that this particular industry also has a much greater body of sector specific academic writing on the counterfeiting problem than any other, a significant proportion of which extends beyond the efficaciousness or toxicological properties of counterfeit products. Indeed there is a body of journal published work which considers technical means to counter the counterfeiter (see for example Catizone, 2006; Deus, 2006; Kontnik, 2006) as well as industry specific reports concerning the link between counterfeit medicines and organised criminality (International Institute of Research Against Counterfeit Medicines, 2013). In terms of other coverage the review recognises the widespread reporting of some of the tragic human aspects of the counterfeit pharmaceutical problem. This is typified by media reporting of the devastating impact of non-genuine malaria treatments

in East Africa where it is believed that as many as a third of administered drugs are fake or sub-standard with the consequential loss of many lives (see for example McLaughlin, 2012).

### **2.3.5 Summary**

By taking a broad approach to writing concerning the worldwide counterfeiting problem the review has demonstrated a number of core themes which dominate both academic and popular writing on the subject. Foremost amongst these are the collective agreement that China is the source of the majority of counterfeit product, that there are variety of factors that generate consumer demand for such goods, and that there is invariably an organised crime link to any significant counterfeiting problem. It is also recognised that the true cost of the problem extends beyond simple economics to include environmental damage and harm to people. These themes are certainly useful in developing a broad understanding of the subject but, with the notable exception of the pharmaceutical industry, they collectively support the Staake et al. (2009) conclusion that the literature lacks sector specific focus. To that end this review will continue by considering the robustness of material relating counterfeit pesticides and if it is indicative of there being a substantive UK problem.

### **2.4 A specific counterfeiting problem: plant protection products (pesticides)**

*“Pesticides are among the most regulated products in the world. However, in recent years, more and more counterfeit and illicit pesticides have been seized all over Europe. These pesticide products are finding their way into the European agricultural system with increasing regularity. As a result, they can ruin crops, affect food chains*

*and ultimately threaten public health and safety*". (Europol & The Office for Harmonization in the Internal Market, 2012, p.4)

The review has thus far drawn upon a body of cross-discipline literature which gives a fair overview of the worldwide counterfeiting problem. However, in turning to consider the counterfeiting of pesticides it quickly becomes apparent that there is a near absence of academic engagement, at least at the business sector level. That is not to say that the subject has not generated a substantial body of what Auger describes as reports literature (Auger, 1975), primarily derived from industry representative bodies and individual trading companies. Auger recognised the value of such sources because of the speed with which an emerging subject, of which this is a good example, is brought to public attention when compared with the traditional academic route. The same could also be said for media reporting of the subject which, weak as it inevitably is in terms of academic rigour, still provides a useful indicator of 'real-time' occurrence. In the absence of published research this section of the review will make use of these sources as a means of determining whether this particular counterfeiting problem is typical or whether there are indications that it is substantially different to that described thus far. This section of the review is split into three parts, the first considering counterfeit pesticides on a global and European level and the second part focusing on these products in the UK context. The final part considers the enforcement, and specifically the police, response to the problem.

#### **2.4.1 Understanding the global context**

When considering the wider coverage of this crime issue it is immediately clear that it is a significant global problem, this to the extent that it commands specific

attention within OECD analysis of the global impact of counterfeiting and piracy (OECD, 2008). In broad terms the problem bears many similarities to the majority of other counterfeiting problems, that is to say the illicit manufacturing and distribution of an imitation of the genuine product in totality, including the container and label (CropLife International, 2006). Distribution of the product also conforms to widely recognised practice with bottles and labels being shipped from source entirely independent of the product itself (Toth, 2011). It is a modus operandi that significantly diminishes the capacity for customs regulation to facilitate the interception and seizure of counterfeit pesticides before they reach their intended destination (Schmider et al., 2012). In common with the majority of other counterfeit products fake pesticides generally have their origins in Asia, and predominately China (Pesticides Forum, 2011; Rowe, n/k) the city of Jintan having been previously noted in this review as a production centre. Interestingly there is some indication, albeit state derived and unsubstantiated, to suggest that as has been previously described the Chinese authorities are beginning to engage with the problem and are attempting to stem the manufacture and distribution of such products (China Daily, 2011).

Considering the economic impact of the proliferation of counterfeit pesticides available material is marked by a reticence on the part of individual manufacturers to publish or publicly acknowledge their consequential losses. Elsewhere in this review it was recognised that this is not an uncommon stance on the part of the victims of counterfeiting, not least because of the potential impact on brand image and consumer confidence (Loken & Amaral, 2010). Whilst the reporting in reputable industry publications of named product being counterfeited is not entirely unknown, for example the case of a fake DuPont product being distributed in Russia (Watson, 2004), it is only possible to glean the potential industry cost by drawing upon data published elsewhere. A recent European Parliament library briefing estimated the market value of pesticides

within the European Union to be in the order of €8 billion per year (Erbach, 2012). Notwithstanding the discussion on the efficacy of such data which follows the European Crop Protection Association estimate that in Europe somewhere between 7% and 10% of the crop protection products in the open market are counterfeit (Drury, 2014). It may therefore be extrapolated that the cost to manufacturers of lost business is likely to be in excess of €0.5 billion a year within Europe alone. Of course this financial loss to manufacturers carries much wider economic implications. It has been estimated that the consequential annual loss in revenue to European governments, as a result of these products by-passing taxation legislation, is somewhere between €21 million and €30 million (ICC Counterfeiting Intelligence Bureau, 2009).

Whilst these figures are impressive in themselves they fail to give a true impression of the local economic impact when counterfeit products find their way into the marketplace. Largely in the form of warnings to farmers and growers publications continually seeks to highlight the risks associated with such products, exemplifying the inclusion of inferior coformulants or a reduction or a complete absence of active ingredient as being the reason behind a lack of product efficacy (Watson, 2004; Drury, 2014). It is acknowledged that making any meaningful estimate of potential crop losses due to the use of counterfeit pesticides is inherently difficult because they may go unrecognised for some considerable time, or indeed never be detected (Drury, 2014). Nonetheless there are documented examples of consequential damage and indeed it seems likely that it was one particular incident, the complete failure of the Kenyan coffee crop in 1979-80 as a result of the use of a counterfeit Chevron pesticide, which originally brought the problem of illegal pesticides into the wider public consciousness (Wadlow, 2009). Since the so called 'Kenyan coffee crop disaster' there have been several high profile incidents involving counterfeit pesticides. Most recently, and probably most notably, the crisis that befell the Punjab agricultural sector in the latter

part of 2015 wherein counterfeit pesticide distributed across the entire region failed to control whitefly leading to the almost complete failure of the cotton crop (India Samved, 2015).

The Punjab incident, locally significant as it was, is both physically and economically remote from the UK agricultural industry. However, there have been incidents much closer to home. The damage caused to hundreds of hectares of maize, potatoes and tomatoes in Italy due a poorly formulated counterfeit pesticide was a well-documented example (CropLife International, 2006). The local economic losses consequential to such incidents are difficult to estimate (CropLife International, 2006), not least because they are not necessarily immediate. An incident involving a non-authorised insecticide being found in peppers originating from the Almeria region of Spain (CVUA Stuttgart, 2007) had consequences far beyond the short-term rejection of crops by distributors. Given that this incident involved residues found in peppers that had reached the supermarket shelf (Mezcuza et al., 2009), and that such residues have been shown to be the most important food-related concern for EU citizens (TNS Opinion & Social, 2010), it is not surprising that long-term confidence in this industry sector was severely damaged. Indeed it has been suggested that the economy of the area almost collapsed as a direct consequence of this incident (Hellenic Crop Protection Association, 1999).

Whereas manufacturers and representative bodies are seemingly reluctant to discuss the economic consequences of the proliferation of counterfeit pesticides they are quick to point out and publicise the potential environmental impact of such products. The word potential is used advisedly here, for there is no published data to indicate the extent to which environmental damage has occurred thus far. Nonetheless it is widely reported that these products are unregulated, untested, and that a detrimental impact upon the environment is a distinct possibility (Sanderson, 2006;

International Pest Control, 2008). This environmental threat is broadly perceived as being twofold; the damage caused by unregulated manufacturing through the inadequate management of potentially toxic material and unregulated waste disposal, and the residue risks associated with unapproved products being used on crops (CropLife International, 2006; EurActive, 2012; Drury, 2014). Whilst lacking case derived evidence a common sense stance is taken pointing out that, because of their low detectability and the possibility if not probability that they will go entirely undetected (Drury, 2014), farmers run an unpredictable risk of causing environmental damage (European Crop Protection Association, 2011b).

A very similar message appears with respect to the likely human cost of the manufacture and use of these products, the emphasis again being on the unknown degree of risk posed by untested and unapproved product. However, whereas the potential environmental damage is largely discussed in theoretical terms the human costs of illegal and counterfeit pesticides is supported by some limited case evidence. Most obvious amongst these is the direct effect on users of such products, a cited example being a case where a laboratory assistant was exposed to an illegal product resulting in severe headaches and vomiting (CropLife International, 2006). The longer term consequences to the on-farm user of the sustained use of such products is better documented, an frequently quoted case being kidney disease allegedly caused to farmers in the North Central Province of Sri Lanka due to high levels of arsenic and cadmium in illegal farm chemicals (Chatterjee, 2012). It is interesting to note that the evidence linking the numerous cases of chronic illness and death with pesticides and herbicides is contested, companies that import such products pointing out the lack of published scientific data to support the World Health Organization study which originally forged the link (Chatterjee, 2012). Moreover the case for there being a potential risk to the wider population as a result of crop residue from illegal pesticide is

similarly unclear. The widely publicised incident of the contamination of the sweet pepper crop in the Almeria region of Spain, the economic consequences of which have already been noted, was notable for the fact that the associated published paper recognised the limitations of current methodology for detecting potentially hazardous crop residue resulting from the use of such products (Mezcuzza et al., 2009).

Nonetheless, the threat to the food chain posed by counterfeit pesticides is recognised in popular media reporting where it is, more often than not, framed in terms designed to maximise the shock factor (see for example Elliott, 2006 and Schmider et al., 2012).

The general tenor of the counterfeit pesticide narrative would suggest that many of the characteristics of the wider problem are also features of this particular crime. Predominant amongst these is the seeming universality of the problem. Reporting of incidence is commonplace across the entire globe, however, a number of probable 'hotspots' are identifiable by virtue of the regularity with which the problem produces headlines in both specialist and popular media; the Punjab and Kashmir regions within the Indian subcontinent (see for example Business Recorder, 2012; Business Recorder, 2013; Rafiqi, 2014; Ul-Hassan, 2014), Vietnam and Malaysia (for example Nguyen, 2013; Wen, 2013) and parts of Africa (Mwita, 2013). More often than not case specific coverage is accompanied by editorial demands for official action to be taken or by state reassurance that such action is already in hand (see for example CropLife International, 2009b; Business Recorder, 2013; Horti Daily, 2013; Mwita, 2013; Nguyen, 2013). In the context of this study what is also apparent is that the problem is not confined to emerging economies, with both industry and popular media reports providing at least circumstantial evidence of a growing European problem.

This review has already made mention of the high profile case of the use of an illegal pesticide which blighted the Spanish pepper industry (British Association to Stop Counterfeiting and Piracy, 2008). Whilst this remains the most widely reported



European incident of such product directly affecting a crop it is not an entirely isolated incident. A similar case of potentially dangerous residue from eight illegal products being found in supermarket products in the UK, and the destruction of several hundred hectares of wheat in France, Italy and Spain as a consequence of the use of a counterfeit herbicide is noted if poorly documented in publicly available industry intelligence reports (ICC Counterfeiting Intelligence Bureau, 2009) . The review also notes the regular reporting of the seizure of counterfeit products across Europe (for example see Horti Daily, 2013). Perhaps most notable amongst these reports was the 120 tonnes of counterfeit product seized in Italy and described as the biggest haul in the EU at the time of the associated operation by the Anticounterfeit and Health Unit of the NAS Carabinieri (Collen, 2009). More recently a ports and airport initiative across seven countries (the UK not being when of them) under the heading of Operation Silver Axe which reportedly led to the seizure of 190 tonnes of counterfeit pesticide over a twelve day period (Europol, 2015). It is also significant that reporting of the Italian incident reinforced the link between the appearance of this illegal product and organised crime activity and quotes an industry expert as suggesting that, given the scale of the problem, such an incident could occur anywhere in Europe (European Crop Protection Association, 2009a). The same expert comment also describes distribution routes into Europe as complex (European Crop Protection Association, 2009b). However, others have been more specific naming Russia and the Ukraine as the primary point of entry (EurActive, 2012). Others, as will be discussed later in this review, have suggested that the ports of north-western Europe are the predominant entry point (Food Chain Evaluation Consortium, 2015). Regardless of the point of entry it is claimed that once such products have crossed the primary border they are shipped to various countries without challenge where they are falsely labelled and sold by OCGs (Toth, 2011).

The suggestion of a Russian organised crime link is supported by reporting which recognises the growth in influence and diversity of operation of post-soviet organised crime, suggesting that there may be as many as 6,000 active Russian organised crime groups (Vassalo, 1996; Galeotti, 2013). Whilst the current 'hot-spot' for European counterfeit pesticide activity seems to be at the eastern periphery a direct link to the UK has been implied. The disappearance of 135 tons of such product in Cherkassy, Ukraine at the end of 2010 prompted warnings of illegal and dangerous products finding their way to other countries which could include the UK (European Crop Protection Association, 2011a). Whilst in this particular instance the UK link is only presented as a possibility it prompts the review to now consider the evidence for there being a substantive UK counterfeit pesticide problem.

#### **2.4.2 The evidence for there being a UK counterfeit pesticide problem**

There is a relative abundance of published research which relates or refers directly to the counterfeiting of plant protection products, albeit this is largely to be found amongst so called grey sources. This material points firmly toward counterfeit pesticides of foreign origin finding their way into the UK agricultural supply sector and ultimately on to farms. This reflects the extent of the publicly acknowledged problem, there being no indication in this body of grey literature of 'home-grown' counterfeit pesticide manufacturing or distribution.

With the possible exception of an ad-hoc study conducted by the European Commission DG Health and Food Safety (DG SANTE) this alternative material is, by and large, methodologically weak. The European Commission report was published in response to the perceived growth across Europe in the trade in illegal and counterfeit pesticides (Food Chain Evaluation Consortium, 2015). Whilst only the executive

summary of the report was made publicly available it is still a valuable contribution to the subject being based upon interviews with industry and Commission representatives, a number of authority and industry surveys, and port specific studies. The report does not specifically make mention of a UK problem but it does make some general points in the European context that are relevant. Notable amongst these is that no feasible method of identifying the true scale of the problem was identified, a feature of all counterfeiting issues that this review has already noted. Interestingly, and contrary to that previously suggested, it identifies the large north-western ports, specifically Antwerp, Hamburg, and Rotterdam, as being the primary point of entry for illegal products from where parallel trading provisions allow their relatively unhindered distribution throughout the EU. The report does not detail how these provisions are abused to facilitate this distribution beyond recognising that it is the lack of a uniform approach to repackaging and the sanctions for cases of misuse that are the major shortcomings in the application of regulation. It makes legislative and non-legislative recommendations, notable amongst which is a need for legislative harmonisation and clarity and a need to enhance awareness of the problem. This study forms part of a wider body of non-academic reporting and comment, much of which lacks the evidence base of the DG SANTE report. Nonetheless the very regularity with which comment appears might in itself be indicative of a substantive UK crime problem. The review will continue by considering this alternative material, highlighting weaknesses where they are apparent and drawing conclusions as to the likely veracity of data contained therein concerning the prevalence of counterfeit pesticides in the UK marketplace.

Considering the general tenor of this material, and in particular industry specific publications, its most striking feature is an frequently repeated message which warns both of the risks associated with such products and an associated increase in incidence. Phrases such as "many farmers were unwittingly using sprays which could

be dangerous to human health and the environment" (Surman, 2012) warn of the dire consequences associated with the proliferation of products that are both untested and unregulated (Case, 2014), whilst others describe their UK use as growing at an alarming rate (Bounds, 2008, European Crop Protection Association, 2008). These admonitory pieces are primarily aimed at farmers and growers but not exclusively so for a variation on the theme is observed and directed at the supply trade, this having a somewhat greater emphasis on the likely impact of the problem upon industry profits (Toth, 2011). However, it is important to note that in the course of this review no articles were identified in either reporting strand which could be said to contain proven evidence of a counterfeit pesticide being found and positively identified on a UK farm<sup>9</sup>.

Nonetheless, and despite a lack of documented case evidence, the very regularity with which the proliferation and risk messages are promulgated by popular media sources might indicate that the threat is well understood. However, whilst it is perfectly possible that there is widespread industry appreciation of the problem there is little or no evidence to suggest that this is supported by independent study or analysis. Indeed the solitary subject specific university derived paper identified in the course of this review is predominantly a summary of the industry generated discourse on the subject. It draws heavily on European Crop Protection Association (ECPA) data to support the argument that there has been a significant increase in the trade in counterfeit pesticides (Fishel, 2012, pp.1-4). Unfortunately, despite a lack of primary

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<sup>9</sup> As was described in the methodology to this review to increase the likelihood of identifying on-farm incidence of this a series of real-time internet alerts, based on the search terms used for the wider review, were designed and run over an eighteen month period. This technique was used to capture reporting that would not generally find its way into academic writing. In combination these searches identified fewer than five reports that referred directly to the possibility of a counterfeit product being found on a UK farm, none of which were subsequently reported as being confirmed.

research and a failure to critically assess the secondary sources upon which he relies, the author lends academic credence to unverifiable estimates as to the scale and impact of the European problem including the UK. That said, and in defence of the Fishel paper, it does represent a relatively comprehensive summary of current industry understanding of the subject. Moreover, and as has been previously noted in this review, the problems associated with researching a clandestine trade dominated by organised crime groups renders any original research into counterfeiting problems inherently problematic. Considered in this context the paper could be seen as simply utilising 'best evidence' in what is clearly a difficult academic situation. Nevertheless, the manifest weakness of what is ostensibly an independent analysis of this crime problem prompts this review to consider the veracity of the material which collectively forms the popular narrative on counterfeit pesticides and which underpins this solitary example of academic comment on the subject.

Perhaps the most obvious incongruity within this material can be seen in popular reporting of the problem where, as has been previously noted, there is an absence of reports of any confirmed incidence on UK farms. As has also been previously discussed this is evidently not the case in those parts of the world where the problem of counterfeit plant protection products is known to be deep-seated and where media reports often appear at a rate of several a week. Significantly this wider case reporting often alludes to the link between the appearance of a counterfeit pesticide and local organised crime activity (see for example Collen, 2009). Herein lies a further inconsistency; at least one industry report suggests that the UK counterfeit pesticide problem is not characterised by such a link (CropLife International, 2006). Such reporting anomalies may be indicative of this crime having some entirely novel character in the UK setting, or a lack of understanding as to the meaning of 'organised crime'. It is also possible that it is characteristic of a relatively sophisticated plant

protection product market. As has been previously noted in relation to other industries a lack of incidence reporting or acknowledgment of an organised crime link is often consequential to a general unwillingness on the part of manufacturers to acknowledge incidence for fear of damaging the reputation of their high value brands.

Potentially of greater concern then is that when the scale of the problem in the UK becomes the subject of direct questioning outside of the core industry the response is also at odds with the dire warnings previously discussed. Some informed comment, such as a representative of the Chemicals Regulation Directorate (CRD) telling a Pesticides Forum meeting that there was little evidence that such counterfeit products were common in the UK (Pesticides Forum, 2011), does not reflect the common industry discourse or associated media coverage. Indeed there appears to be a considerable degree of uncertainty as to the scale of the problem in the UK. Figures given by industry representative bodies for the percentage of the market being lost to counterfeit products vary anywhere between 2% and 10% (European Crop Protection Association, 2008; Surman, 2012). Moreover where incidence data is cited there is an inclination toward quoting figures for the entire European Union, often as high as 25% of the market, but with scant or no reference to the likelihood that it is not necessarily consistent across the entire area (for example Bounds, 2008; Matthews, 2010). As this review has already noted there is some evidence to suggest that the European problem is concentrated on those areas at the Eastern periphery notably Ukraine (Sissell, 2008; European Crop Protection Association, 2011a). If this is the case then this renders the cited European average largely meaningless, at least in the context of a study concerned specifically with the problem as it manifests itself in the UK.

Perhaps most significantly, and well demonstrated by the previously discussed Fishel (2012) paper, there is no indication as to the source of cited occurrence figures. Inevitably this brings into question their intrinsic value as research data and it would

seem that this study is not the first time that this issue has been recognised. In 2013 the European Parliament, in response to a written question which asked what was being done to tackle the problem of illegal pesticides, questioned the regularly quoted occurrence figures. They suggest that published information has usually referred to a single case and has been based on private investigations rather than on official collected data (European Parliament, 2013). If, as this statement implies, the information being promulgated is industry derived rather than produced by an independent source then this is typical for a counterfeiting problem. Indeed those who have previously reviewed the research concerning the economic effects of counterfeiting have concluded that the very basis for empirical research is weak. Study has often been forced to rely on indirect data and selected information provided by the holders of intellectual property rights (see for example Fink et al., 2010).

Crucially in the context of this study these and other concerns relating to the methodology applied in counterfeiting research have prompted an extensive investigation and report into the matter. This was commissioned by the Intellectual Property Office (IPO), an executive agency sponsored by the UK Department for Business, Innovation and Skills (Collopy et al., 2014). The IPO report is wide ranging and is highly critical of much of the current research into the overall counterfeiting problem. Highlighted to be of particular concern are industry derived studies, such as those that largely inform current thinking on the UK counterfeit pesticide problem. The report concludes that they are generally ad hoc in design and that unsubstantiated opinions are often treated as facts. The study found a lack of transparency in both the methodologies adopted and the data used to evidence claims and that source data is generally not made available for verification. Moreover commercial interests are often cited as justification for a lack of clarity and that, presumably as a consequence, little effort is made to benchmark data provided by individual companies. Ultimately the IPO

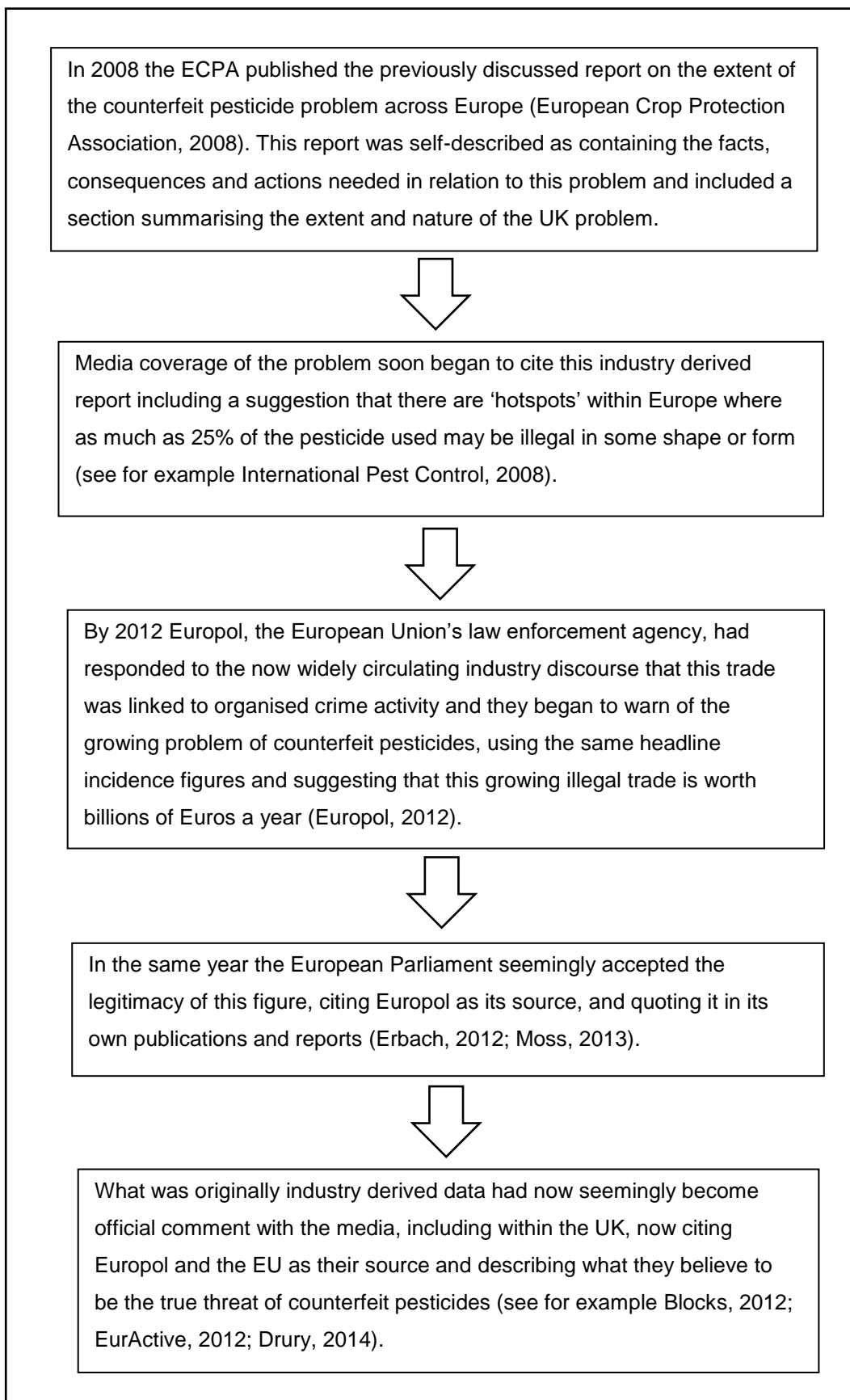
found that such studies and the data contained therein are an unreliable basis for policy formulation. It is an important conclusion for it is one that concurs with the findings of other informed writers on the subject. For example Fink et al. (2010) found that all data concerning counterfeiting is based on crude assumptions whilst others have deduced that there is a near absence of valid and reliable data (Heinonen et al., 2012). As a consequence it is all but impossible to reveal the true extent of the counterfeiters' activities (Vithlani, 1998; OECD, 2008). Collectively these criticisms should be a cause for some concern. If the ECPA (2008) report, which was used as the data source for the Fishel (2012) paper and has dominated popular UK comment on the subject since its publication, is considered in the light of the IPO study it is found severely wanting.

The ECPA report claims to present the 'facts' about the counterfeit pesticide problem. This is without indication as to the source of the data upon which this claim relies beyond stating that it is based on statistics, market dynamics, percentage of customs seizures and case-by-case country studies (European Crop Protection Association, 2008). There is no indication of the overall methodology utilised nor does it indicate whether data gathering was standardised in any shape or form across the various subject countries. Moreover the calculations used to estimate counterfeit market share are not given, nor is the source data disclosed. In fairness the report does cite a modest amount of published material, primarily drawn from an OECD (2008) report. However, this is only used in the context of describing the impact of the wider counterfeiting problem. Beyond this the ECPA (2008) report is, to use the IPO locution, an ad hoc piece of research and one that, if subjected to their standards, would most likely be deemed inadequate for developing a response strategy. This review is therefore bound to consider how, if industry derived data is considered so



inherently unreliable, such information concerning counterfeit pesticides came to be so widely promulgated in the context of the UK problem without challenge?

Interestingly in reviewing the provenance of this data it becomes apparent that the lack of critical analysis may, at least in part, be because it has gone through a process that might be described as 'knowledge laundering'. It is not suggest that there has been a deliberate attempt to deceive. What is observed is a subtle and seemingly overlooked process by which industry derived data has acquired legitimacy through official use, and has then been recycled by the industry having acquired an official tag in the intervening period. Looking specifically at incidence data for the EU and the UK Figure 2.2 illustrates how this process appears to have occurred. The ECPA report, which began the process illustrated in Figure 2.2, concluded with a summary of the problem across a broad cross-section of European countries including the UK. The headline points from the UK section were that counterfeit products were estimated to account for 2% of the market and the key driver was believed to be price. The industry was described as being in close contact and collaboration with enforcement agencies to tackle the problem (European Crop Protection Association, 2008). No source is given for the basis of these claims. It is apparent then that commonly cited occurrence data for counterfeit plant protection products in the UK may be significantly flawed. Nonetheless this data, often accompanied by a summary of the potential risks that the use of such products carries, has long been a feature of industry and media comment on the subject. Whilst the narrative is consistent in its message it lacks supporting evidence. As such it leaves the possibility that the pervading common knowledge on the subject and the current response are both based on a set of unsupported assumptions. This represents a significant area of uncertainty. What is also less than clear is the extent to which the industry narrative, accurate or otherwise, has prompted any form of enforcement agency response.



**Figure 2.2:** The 'knowledge laundering' of counterfeit pesticide data

### 2.4.3 The police and other enforcement response

As with any recurring crime a review of the literature might reasonably expect to find evidence of an enforcement agency response that reflects the extent or impact of that crime. However, and as this review has already highlighted, in the context of unsubstantiated industry generated data it is inherently difficult to determine the true extent of any counterfeiting problem with any degree of confidence. In the case of counterfeit pesticides, and again as has been previously highlighted, this problem is exacerbated because the consequences of using such a product on a growing crop are likely to be masked by other yield influencing variables. As such even determining that a crime has occurred is far from straightforward. Nevertheless, and solely for the purpose of achieving a rudimentary indication as to whether the probable magnitude of the problem is such that it would be reasonable to expect to observe some form of police response, this review will assume that incidence is at the lower end of UK estimates, that is to say 2% of the total market. Extrapolating the potential economic cost of this, on the basis of published industry statistics for the net value of the UK national agrochemical market (European Crop Protection Association, 2014), it is apparent that even a conservative estimate of the economic cost of this crime would be in the order of £9.2m a year<sup>10</sup>. Of course the actual figure may be somewhat larger if, as one industry commentator has suggested, the UK market for counterfeit pesticides may be significantly greater than 2% of the total and may conceivably be as much as 10% (Surman, 2012). Potentially then this is a substantive crime. To put this in context

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<sup>10</sup> This estimate of the size of the counterfeit pesticide problem is derived from European Crop Protection Association (ECPA) estimates of the likely percentage of the market lost to these products within seventeen individual European states, the United Kingdom being one (European Crop Protection Association, 2008, p.19). The given figure of 2% was then applied to the most recently available published data for the total size of the UK crop protection product market of £460m (European Crop Protection Association, 2014).

when compared to published data for theft from UK farms in simple economic terms it is admittedly a somewhat smaller problem (NFU Mutual, 2014). Nonetheless it is far from insignificant, for if the two were to be combined counterfeit pesticides would account for over 17% of the total. It is perhaps somewhat surprising then that, as will become apparent, it is suggested that where UK police engagement with farm theft is consistently high there is a near absence of reporting which would indicate that they are engaged in any meaningful fashion with the problem of counterfeit pesticides<sup>11</sup>. Whilst this lack of engagement may be indicative of the police having determined that this is an issue that does not necessitate response if this is the case it is seemingly at odds with other jurisdictions. Reporting from elsewhere would suggest evidence of enforcement activity at source, in transit and national borders, and elsewhere in the European marketplace.

This review has previously considered publications where the Chinese authorities are criticised for failing to tackle counterfeit problems at what is widely acknowledged as being the primary source. However, there is also a strand of reporting which suggests a growing inclination on the part of the Chinese state to meet the demands of the WIPO and to more actively intervene to support the trade related aspects of intellectual property rights contained within the prevailing WTO agreement (World Trade Organization, 1994; World Intellectual Property Organization, 2009). The English speaking Chinese media regularly reports on local enforcement agency intervention to clamp down on the manufacture and distribution of counterfeit agricultural inputs, pesticides included (see for example China Daily, 2011; Xinhua News Agency, 2013). This enforcement activity has been sufficiently robust for the

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<sup>11</sup> A notable exception to this absence of police engagement has been Operation Silo, a Thames Valley Police initiative that focused on the counterfeit pesticide problem and was prompted by this study and supported as part of the data gathering phase of the research.

resulting prosecutions to be acknowledged and praised by at least one renowned representative trade body (CropLife International, 2009a). However, it does not appear that pesticides are receiving any special attention and that this simply reflects a growing inclination on the part of the Chinese authorities to intervene in the overall counterfeiting problem. Moreover despite any state intervention illegal products are still finding their way out of the country in very large quantities (Europol and The Office for Harmonization in the Internal Market, 2015). Much has been made of the need for robust legislation to enable customs authorities to intercept such goods before they reach the marketplace (OECD, 2011, Schmider et al., 2012; IPKat, 2013; Florczyk, 2014) and indeed there is some evidence of success (Henshaw, 2011; Europol, 2015). However, large quantities of counterfeit pesticides are not intercepted en route and presumably this finds its way into the local distribution chain and then to farms. In response it seems that some European authorities have recognised the threat that this poses to the market and have actively engaged in enforcement initiatives. This ranges from the technical revocation of authority to place a product on the market (BVL, 2014), through local initiative and investigation (Horti Daily, 2013), to major intelligence lead operations conducted at a national level and involving pan-European agencies (OLAF, 2014).

The last of these examples illustrates the potential for a coordinated multi-agency approach to have a significant impact on the trade in counterfeit pesticides; 21 tonnes of illicit product was seized and a criminal investigation initiated as the result of a joint operation between the Polish State Plant Health and Seeds Inspection Service, Polish customs authorities and the European Anti-Fraud Office (OLAF). The importance of such market level intervention as a means of stemming the flow of counterfeit goods is recognised. The United Nations Office on Drugs and Crime (UNODC) suggesting that organised crime groups have become less important than

the markets with which they engage (United Nations Office on Drugs and Crime, 2010). Taken alongside the current World Intellectual Property Organization emphasis on the importance of agencies taking the initiative to enforce intellectual property legislation in the absence of a right holders' complaint, so-called ex-officio actions (Fink et al., 2010), it paints a picture of a growing expectation for direct engagement at a market level on the part of enforcement agencies.

Whilst sporadic examples of effective enforcement practice can be identified it is also suggested that, on the whole, this expectation is not being met, containing as it does criticism of the efficacy of local engagement. Credible comment, such as that outlined within a UNODC analysis of the response to transnational organised crime activity, questions the overall ability of enforcement agencies to engage with counterfeiting problems at a market level (United Nations Office on Drugs and Crime, 2010). This concern is mirrored in the somewhat critical observations of Europol which endorses a campaign group claim that, with specific reference to counterfeit pesticides, enforcement activity is weak in some countries and doesn't exist in others (EurActive, 2012). Industry comment is rather more reserved, suggesting as it does that this lack of enforcement engagement is a consequence of a lack of awareness on their part of the diverse adverse effects of counterfeit pesticides (CropLife International, 2006). There may well be an element of ignorance with regard to the physical and economic consequences of the use of such products on the part of the police. Nonetheless their seeming lack of engagement with the counterfeit pesticide problem is surprising given that they have already forged the links between this trade and organised crime group activity. At a transnational level Interpol have recognised and highlighted the association between counterfeiting, organised crime group activity and terrorism (Interpol, 2014) and Europol have extended this association to include counterfeit

pesticides, seeing fit to include the wider counterfeiting problem in their strategic serious and organised crime threat assessment (European Police Office, 2013).

Where evidence of an awareness of the OCG link is observed it also seems that, in the context of the overall organised crime threat, intellectual property theft is seen as a rather modest component. Cabinet Office strategic analysis suggests that its annual economic cost to the UK is in the order of £300 million, of which this review has already surmised that something in the order of £9 million, approximately 3% of the total, may be accounted for by counterfeit pesticides (Cabinet Office Strategy Unit, 2009). Compared to the trade in illicit drugs, at £17.6 billion and nearly sixty times bigger than the total for all counterfeit goods (HM Government, 2011a), it could be argued that the trade in counterfeit pesticides is too small a problem to reasonably expect any form of concerted police response.

Such a disparity might lead to a conclusion that it is probably inevitable that the headline commanding trade in illegal drugs, people trafficking, and the smuggling of alcohol and tobacco will dominate police priorities. However, this should not necessarily be the case for there is evidence of a significant shift in government policy toward tackling local manifestations of organised criminality. With the launch of the *Local to Global* initiative, and the establishment of the National Crime Agency, there is an explicit recognition that “unlike other national security threats the effects of organised crime are felt by individuals, communities, businesses and our economy on a daily basis” (HM Government, 2011a, p.5). This new strategic focus is firmly on the police actively engaging with organised crime at a local level, the sale of counterfeit pesticides being an example in the rural setting.

Initiatives aside because there is undoubtedly a criminal element to the distribution of counterfeit goods there is a statutory obligation for the police to respond (Rahmatian, 2004; Barrie & Wright, 2010). However, it has also been observed that the

police simply have other more pressing priorities, a feature that that is likely to become more pronounced as funding constraints force rationalisation of core policing activities (Phillips, 2007; HMIC, 2014) . Informed comment implies that the result of this is that the industry is left somewhat isolated, trying to tackle the problem using the civil law provisions available to commercial companies to protect their intellectual property (CropLife International, 2011b). Despite a recognisable effort on the part of the industry to reinforce the importance of the detection and prosecution of offenders as an effective means of tackling the counterfeit pesticide problem (Drury, 2014), and a call by way of a parliamentary early day motion for a wider appreciation of the potential consequences to the consumer of this illicit trade (Farron, 2008), the enforcement agency response still appears to be negligible.

Despite this lack of direct response there are at least some indications of a growing police awareness of the consequences of counterfeiting at a national level. The Police Intellectual Property Crime Unit, an operationally dependent unit based within the City of London Police, is a specialised unit committed to protecting UK industries from intellectual property crime (City of London Police, 2015). However, it is clear from their media and online output that the focus is very much on offences committed online and there is no evidence to suggest any concerted engagement with physical counterfeiting problems such as pesticides (albeit there remains the possibility that the trade in these goods may be facilitated by web-based trading facilities). The same could also be said for Action Fraud, again a specialist unit based within the City of London Police, which is the national policing lead for fraud based crime (City of London Police, 2014). Again there is no evidence in their published output to suggest engagement with counterfeit pesticides, despite the core offence being one of fraud. Nonetheless the very existence of these units at least suggests the potential for police engagement with this crime problem at a national strategic level, albeit without



evidence of this having occurred thus far. Whether this is also true of local policing, that is to say policing in the rural environment, is also a matter of conjecture. With a few notable exceptions, for example the articles contained in the Mawby and Yarwood edited collection of rural policing case studies (Mawby and Yarwood, 2010), there is a relative paucity of criminological and criminal justice writing which refers or relates directly to the setting of policing priorities in the rural environment<sup>12</sup>. In particular the question of how the police construct their definition of what constitutes 'rural crime' and what should, or should not, be on the rural policing agenda is not addressed.

It would seem then that, at least in the case of counterfeit pesticides, there is a considerable disjoint between the strategic aspiration of government for the police to engage with the activities of organised crime groups at a local level, and the extent to which media reporting of the policing of rural crime indicates this is actually happening. In seeking to understand why this might be the case a number of factors emerge which are worthy of consideration. Not least is the possibility that the UK police are simply poor at recognising and engaging with organised crime at a local level (Galeotti, 2013). This, taken alongside the sheer complexity of the legislative framework that surrounds counterfeiting and the practical complications associated with prosecution when it requires the coordination of multiple public prosecution agencies (House of Commons Justice Committee, 2009), may at least partly explain this failing. There would seem then to be no imperative for the police to engage. A case, as Phillips (2007, p.188) puts it, of this being seen as largely a victimless crime and their being unwilling to get involved "unless there's a dead body". It is at this point that the review turns to the rural criminology literature to consider if helps in understanding this.

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<sup>12</sup> The subject of criminological and criminal justice theory is discussed in section 2.4.4 of this review.

#### **2.4.4 Theories of crime and counterfeit pesticides**

Having described the characteristics of the UK counterfeit pesticide problem, at least so far as they can be ascertained, the review continues by considering if theory can aid our understanding of the crime and the police response to it. This is an offence that has been recognised elsewhere in this review as being intrinsically linked to organised crime. Theory that seeks to aid understanding of organised criminality would therefore seem to be a reasonable starting point. Of the relevant theoretical approaches observed in publications two that make a convincing case for explaining the emergence and growth of organised crime are strain theory and enterprise theory. These two theories have been chosen for discussion because together they link the previous discussion on the role of consumers in the growth of the market for counterfeit goods (section 2.3.2), and specifically push and pull factors, to crime theory.

Strain theory proposes that society is structured in such a way that it encourages deviance. Specifically it claims that societal pressure to achieve socially accepted goals is crucial in understanding the motivation of offenders including those involved in organised crime (Abadinsky, 2009). It is the strain of achieving these goals, regardless of means, which gives the theory its name. Given the likely financial returns from trading counterfeit pesticides, a means of achieving financial goals, there seems no reason why this theoretical approach should not be as useful in understanding this manifestation of organised crime as any other. It is a theory that sits comfortably alongside the previously described push factors that are believed to influence the growth in the volume and range of counterfeits reaching the marketplace. However, this is a theoretical approach that is offender focused and so it is probably has much less to offer in terms of explaining the enforcement response.

Enterprise theory, as described by Smith (1978), states that the emergence of organised crime can be explained by a failure on the part of legitimate markets to

satisfy actual and potential customers; organised crime is therefore a response to consumer demand. This has a strong resonance with the work of Stumpf et al. (2011), described in section 2.3.2 of this review, who describe this same phenomena from a consumer motivation point of view. Certainly this is an approach that has resonance when considering non-deceptive counterfeit products, that is to say ones where the consumer knowingly engages with a counterfeit product. However, it seems less likely to be applicable where the consumer is not aware that they are buying a non-genuine product (as would appear to be the case with counterfeit pesticides that are passed off as parallel product). Moreover, and in common with strain theory, it is primarily concerned with offender motivation and similarly unlikely to contribute a great deal toward explaining police response.

Besides these two theoretical approaches there are various less widely known approaches which have been applied to the understanding organised crime. A number of these are summarised by Kleemans (2014) who offers various alternative perspectives including alien conspiracy theory, the bureaucracy model, illegal enterprise theory, protection theory, the social network approach, and the logistic or situational approach toward organised crime. Each of these theoretical variants has its own inherent logic and may well be useful in explaining individual aspects of organised crime. Indeed they would be useful were this study concerned with explaining the emergence of counterfeiting as a crime of choice for OCGs. However, across this spectrum of theorising there is nothing to suggest that consideration has been given to the influence of 'the rural' in the emergence or policing of organised crime. For this reason, and without diminishing their wider value, they are likely to be of limited value in this context. In the circumstances then it seems appropriate to approach the question from the opposite direction; to consider if rural criminology and its associated theorising offers any greater promise.

Rural criminology, as a discrete academic subset, exists at the margins of the wider discipline. The core focus of criminology continues to be on crime in the urban setting (Donnermeyer et al., 2013). Given the relative paucity of research that is specifically concerned with police policy and priority setting in the UK rural context it seems likely that criminal justice studies are similarly marginalised<sup>13</sup>. In Australian studies this bias has produced what Hogg and Carrington (2006) describe as a sociological and criminological urbanism. It is a description that could equally well be applied in the UK context. Moody (1999, p.9) tells us that here the rural dimension to crime has been ignored in favour of the setting provided by inner cities or peripheral housing estates and as a result “the field of rural criminology remains largely unexplored, at least in any analytical or critical sense”. Perhaps as a consequence rural criminology suffers from what Donnermeyer et al. (2013, p.71) describe as a “theoretical under-development”. This is seen as a contributory factor in the discipline’s narrow perspective on rural crime wherein crime and disorder are seen as the “by-products of urbanisation and not endemic to rural places” (Donnermeyer et al., 2013, p.70).

Elsewhere the notion of a ‘rural idyll’, a concept extensively described by Mingay (1989), is framed as one that maintains the allusion of a rural homogeneity. This is to the extent that beliefs about rural crime are generalised and largely incorrect (Buttle, 2006). It is a feature which Donnermeyer and Dekeseredy (2013) tell us has hindered research into rural crime as a consequence of a reliance on place-based theories. The net result of this has been that academics have essentially “ignored

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<sup>13</sup> In describing a near absence of research into rural police policy setting this study acknowledges the work of Professor Rob I Mawby in this area, and particularly the contribution of Mawby and Yarwood (2016) in using an international inter-disciplinary perspective to bring together work that considers the range and consequences of policing across rural localities in a number of countries.

structural characteristics of rural places that engender crime” (Donnermeyer & Dekeseredy, 2008, p.8). This is not to suggest that there is a complete absence of research that steps beyond the artificial confines created by the notion of a utopian countryside. For example some have considered the consequences of rural poverty and exclusion as causes of a local crime problem (see, for example, Petee & Kowalski, 1993). Moreover recent ethnographic studies, such as that conducted by Smith and McElwee (2013), have made some modest progress toward dispelling the widely held belief that crime in the rural setting is largely down to the activities of the ‘urban marauder’. This particular study examined alternative income generating strategies at the margins and beyond the bounds of legitimate agricultural practice. It documented the activities of the farming community as a source of offending rather than accepting the long-standing notion of the farmer being typically the victim of crime. However, whilst such individual studies make a notable individual contribution, the overall literature points toward the work of those who pursue a critical strand of thinking as being at the forefront of challenging the traditional view of crime in the rural setting (see for example Donnermeyer et al., 2013).

Chadwick and Scraton (2005) describe a critical criminology as one that emphasises the importance of structure and agency in the study of crime and the administration of criminal justice. Discourses concerning crime are seen as being sustained by those in society that benefit from power and knowledge and that such discourses inform the legislation, policy and practice of institutions, organisations and professions. In the context of this thesis this is a concept that may prove valuable for it is concerned with a crime that is largely understood through just such a discourse. However, enthusiasm for this possibility must be tempered for Chadwick and Scraton also suggest that such discourses “are developed and reproduced through the primary determining contexts of class, race and gender” (Chadwick & Scraton, 2005, p.71).

These are contexts that have not been immediately obvious in the industry generated material concerning counterfeit pesticides. Nonetheless a critical approach should not be dismissed out of hand. Writers have recognised a bias in policing, and one that may be more prevalent in rural places than it is elsewhere (DeKeseredy & Rennison, 2013).

Moving to consider whether there may be other potentially useful theory outside of that expounded by critical thinkers Donnermeyer and DeKeseredy (2008), whilst expressing a view that the study of rural crime has been largely descriptive and atheoretical, are prepared to concede that it has not been entirely devoid of alternative theory. However, they conclude that even where there is evidence of researchers venturing outside of the rural idyll paradigm the resulting work is narrow in theoretical focus and tending toward social disorganisation theory (Donnermeyer & DeKeseredy, 2008; Donnermeyer & DeKeseredy, 2013). This particular approach presumes that crime in rural communities is due to a lack of social cohesion and solidarity.

Donnermeyer and DeKeseredy, drawing on earlier work by Barclay et al. (2004) and Jobes et al. (2004), suggest that this represents a major failing in the social disorganisation paradigm because those who use it to frame their research fail to recognise that what they are describing is a difference in, rather than a lack of, social and normative structure. In support of this position those who have critically reviewed the efficacy of this theory when applied in the rural setting recognise that, despite a convergence in rural-urban crime differences, there remains nuances that render social disorganisation theory at best only partly applicable (Petee & Kowalski, 1993).

Nonetheless, and whilst accepting that the predominance of this theoretical approach has probably been to the detriment of wider research into rural crime, social disorganisation theory should not be dismissed as being without value. It may still have an important place in aiding understanding of forms of social cohesion which may have influenced the uptake of counterfeit pesticides in the UK. However, as a theoretical

approach its true value probably lies in developing an appreciation of the cause of the crime, the 'pull' factors previously described, rather than understanding police response to it. This review may therefore reasonably conclude that the Donnermeyer and DeKeseredy assessment of social disorganisation theory holds good and it is therefore unlikely to be helpful in understanding the police response to counterfeit pesticides.

For the sake of completeness the author of this review looked extensively at texts describing criminological and criminal justice theories, including Lilly et al. (2002), Hopkins Burke (2005), and Duffee and Maguire (2007), seeking theory that might provide a useful framework for examining the police response to this particular crime, and in particular the influence of rurality. It would be fair to say that this finding reinforced the assertion of Donnermeyer et al. (2013) that there is a theoretical underdevelopment with regard to rural crime and policing. Nevertheless a critical approach, with its focus on the influence of power and knowledge, the importance of discourse, and recognition of bias in rural policing, would seem to hold the most promise for understanding the UK counterfeit pesticide problem and the police response to it.

#### **2.4.5 Summary**

This section of the review has recognised that, on a European and indeed worldwide scale, the counterfeiting of plant protection products appears to be a significant crime problem. However, when considering the problem in the UK context it is apparent that cited data may be significantly flawed. Nonetheless this data, often accompanied by a narrative that expounds the potential risks that the use of such products carries, has been a key feature of industry and media comment on the subject. That is not to suggest that the problem does not exist, rather that despite the

message being consistent it lacks supporting evidence leaving the possibility that the pervading 'common knowledge' on the subject is the product of industry hyperbole.

It has been suggested that the enforcement response to the worldwide counterfeit pesticide problem is, at best, sporadic. In the European context there is evidence of some police engagement, however, this does not extend to the UK where there is no suggestion of any police response to the problem. Importantly in the context of this study rural criminology seems an unlikely source of theory that might shed light on this seeming detachment.

## **2.5 Conclusions of the review**

Counterfeiting is a huge global crime problem and one that in recent years has moved beyond its 'traditional' home in luxury goods to include every conceivable type of product from foodstuffs to aircraft part. This review found a large body of literature associated with the problem across numerous disciplines, each taking its own particular slant on the problem and reflecting their own disciplinary focus. However, and possibly as a consequence of this selective focus, what was also found was a that research which took an eclectic view of the many factors that contribute towards a counterfeiting problem in any given industry sector were relatively scarce. This was consistent with the Staake et al (2009) findings discussed in the introduction to this review. It was also certainly the case for the pesticide manufacturing industry as becomes apparent when considering the extent to which the first study objectives has been previously addressed.

In considering whether there is evidence of counterfeit pesticides being present in the UK agricultural marketplace popular reporting media would indicate that they certainly are. However, this was found to be almost exclusively the perspective of a



select group of industry commentators whose interpretations had been recycled to become the accepted European enforcement and legislative narrative. It was a narrative that was poorly evidenced, contained little if any methodological detail, and entirely lacked the perspective of other stakeholders. Whilst this may well have been a reasonable interpretation of the problem it seems likely that it was a far from complete picture. For example a frequently cited link between the trade in parallel products and the import and distribution of counterfeit products was observed but this mechanism was inadequately described and there was no indication as to the market drivers that underpin this illicit trade. This lack of clarity owed much to there being no documented incident of a counterfeit pesticide finding its way onto a UK farm and having a tangible impact. Similarly the review found no published case study of product being seized by an enforcement authority and its provenance scrutinised. It followed, therefore, that the perceived link to organised criminality is not proven.

Turning to the second study objective which, assuming there is a substantive problem, sought evidence of police engagement with it there was evidence of enforcement activity on the European mainland. However, considering the UK in isolation, there was no indication of a similar response. Whilst the review would not have encountered covert or non-publicised police activity what was available in the public domain was indicative of this crime not being addressed at a national level through the activities of the NCA, PIPCU, or Action Fraud, the most obvious points of contact. Of course this still left the possibility that, in policing terms, this might be considered to be a local problem to be dealt with as such. However, the available material was not helpful in ascertaining if this problem appears on local policing agendas or whether there is any knowledge of the crime amongst operational police staff.

Assuming that there is a substantive problem, and further assuming there is no police engagement with it, the third study objective considered why this might be the case. Nothing was found in industry or police publication or media reporting to indicate what lies behind this lack of engagement. In addition there was a near absence of literature on the setting of police priorities in the UK rural environment. Moreover it could not be determined where the operational focus falls and consequently it was not possible to say why the police might not be tackling the counterfeit pesticide problem.

Collectively these omissions represented a significant gap in the overall appreciation and understanding of the UK counterfeit pesticide problem. This is a gap that needed to be addressed by research if the study objectives were to be met and the aim of determining whether it represents a substantive threat to the UK agricultural industry achieved. However, the review of relevant criminological theory failed to identify an obvious explanatory framework that would assist in developing such research. That is not to say that the use of theory was dismissed for a critical approach certainly held some promise. However, given what was known about this particular crime it was difficult to say with any certainty that this was a reasonable theoretical approach within which to proceed. This conundrum informs the discussion on locating the research which begins the following chapter.

### 3.0 Establishing the principles of the research

Having identified a need for research this chapter will firstly locate the resulting study in terms of an appropriate academic discipline before presenting a statement of ethics and considering the choice of methodology and research design.

#### 3.1 Locating the research within an academic discipline

Given that this is a multi-faceted problem it is one that would, or at least should, be of academic and practical interest to a number of disciplines. The study could, for example, have been undertaken by one inclined towards the natural sciences to determine the potential physical impact of counterfeit pesticides on crop production, or alternatively a student of business management who might have considered the implications for high value pesticide brands consequential to the proliferation of such products. However, whilst such studies would undoubtedly have furthered the wider understanding of the problem they would not necessarily have helped to mitigate the immediate threat that counterfeit pesticides potentially pose to the UK agricultural industry. Arguably this might only be achieved by recognising that it is a crime threat, and therefore one that might be addressed through an appropriate criminal justice response. For this reason the research was conducted within the academic compass of criminal justice studies which, in this context, was understood to be:

...the applied and scientific study of the *practical* applications of criminal behaviour; that is, the actions, policies, or functions of the *agencies* within the criminal justice system charged with addressing this behaviour. [Italics in original]

(Dantzker, 1998, p.30)

It is acknowledged that locating the study within the bounds of criminal justice rather than under the wider rural criminology heading might seem to be an unnecessarily fine distinction. However, as Maguire and Duffee (2007) have argued, criminal justice is not simply applied criminology rather it has an independent identity as the study of law making and law enforcing. It is, therefore, fundamentally more than a practical variant of a parent discipline. Moreover this decision reflects a finding of the literature review that contemporary rural criminology theorising is insufficiently developed to aid understanding of emerging crimes such as counterfeit pesticides.

This is not to entirely overlook the relevance of criminological theory in this context, indeed the potential value of a critical approach was recognised in the literature review. Moreover it is arguably also necessary to have at least a rudimentary understanding of the cause of any crime in order to appreciate the relevance and proportionality of a police response to it. However, as Heinonen et al. (2012) observed there is a general lack of criminological theorising with regard to the crime of counterfeiting. This may well be a reflection of the multifarious nature of the problem, and if this is so then arguably no single criminological theory could conceivably hope to fully encompass the plethora of economic, environmental and social influences that characterise this illicit activity. Moreover for the same reason any attempt to construct an original explanatory theory of cause was certainly beyond the scope of this, and conceivably any other, study. The pragmatic response was, therefore, to accept that the crime simply is what it is, making no further attempt to explain causal factors beyond those observed in the literature review.

Qualifying the study in this manner does not imply that the research did not endeavour to identify and describe the modus operandi of this crime and those factors that may underpin its proliferation when seen in the UK context. This certainly forms part of an overall understanding of the threat and is fundamental to formulating a

response. Nonetheless, it must be stressed that the aim of this study was not to understand the root cause of the crime, a criminological analysis that would by implication suggest an attempt to explain the wider causes of counterfeiting, but rather to consider whether, in the context of the criminal justice response, one specific variant of the counterfeit problem poses a substantive threat to the UK agricultural industry.

Fundamentally this approach owed much to the thinking of Ulrich Beck and his consideration of uncertainty in the modern age; what he described as the 'risk society' (Beck, 1992). Beck's perspective, which sets the context for the research that follows, focuses on 'modernisation risks', that is to say risks that are the product of the coming together of capitalism and technology. This may include, for example, threats as diverse as global warming and the worldwide financial crisis which characterised the early part of the twenty-first century. As was noted in the review of the literature the threat posed by contemporary counterfeiting presents just such a risk; it has emerged out of the coming together of new technologies which facilitate the mass production of copies of genuine items to meet the demand for such goods which is consequential to the globalisation of world trade. This being the case seeking criminal justice theory that might explain the police response to this particular counterfeiting problem, and one that had the management of risk as its core concern, seemed an entirely appropriate. However, given the lack of previous research into the subject there was patently no academic experience to draw upon and understandably the literature review did not illicit an obvious theoretical approach which would satisfy this criteria. As a consequence the study entered the research phase atheoretically and might, therefore, have been described as grounded in its approach. However, and acknowledging that grounded theory purists might have taken exception to a declared predilection toward a risk focused explanatory theory, the study made no claim to be one rooted in mainstream grounded theory. Rather the research is better described using the much

broader classification of inductive; that is to say it sought to find theory to explain what was observed in the data rather than starting with a theoretical standpoint and then seeking to prove its validity. An inductive approach to research begins with observations and the search for patterns and, as (Neuman, 2013) describes, explanations for those patterns. Theory emerges only later, and indeed the question of a suitable approach is returned to later in the thesis. The study design which follows reflects this principle.

### **3.2 A statement of research ethics**

The following ethics statement was written following the outline and guidance provided in the Economic and Social Research Council sponsored Research Ethics Guidebook (Boddy et al., 2010):

The research was necessary and justified because counterfeit pesticides have been widely reported as having a considerable impact in those parts of the world where they have become an endemic problem. In these regions the local agricultural economy has suffered and in addition there is believed to have been significant, but largely unquantifiable, environmental and human costs. Prior to this study no research had been undertaken to ascertain if the UK was at risk of counterfeit pesticides having a similar impact. The purpose of the research was therefore to achieve an understanding of the threat posed to the UK agricultural industry by counterfeit pesticides with a view to making recommendations to mitigate the threat should it be shown to exist.

The choice of study methodology was largely determined by the need to look beyond the industry generated narrative which a review of the literature found to dominate the popular discourse pertaining to counterfeit pesticides. In being thus

guided the study negated the risk of accusation that it simply reinforced what might be perceived as entrenched industry bias or vested interest. The quality of the ensuing research was assured through strict adherence to the Doctoral research monitoring framework detailed in the Harper Adams University Postgraduate Research Students' Handbook (Harper Adams University, 2015).

All participants in the study did so voluntarily and with no coercion employed or incentive offered. Individual participants were assured that all of their personal information and any data supplied would be held securely. They were further assured that if the data they supplied were to be used in the study it would be suitably selected and redacted to ensure that it could not be attributed to an individual. For the purpose of anonymity throughout the thesis and in any associated article individual study participants were referred to by way of a coded reference rather than by name. Absolute assurance was given that copies of interview recordings or associated transcripts would not be placed in the public domain. These measures, along with assurances that all of the information supplied and any residual personal data would be destroyed on completion of the study, were intended to minimise the risk of financial or reputational damage or of upset or emotional harm which may have been caused by the loss or injudicious use of data. It is acknowledged that in the course of describing data gathering and presenting the results some organisations are identified. Where this is the case it is with the prior knowledge and approval of that organisation.

No attempt was made to directly engage with the organised crime groups or members thereof that were believed to be implicated in the trade in counterfeit pesticides. It was therefore not anticipated that there was an increased risk of physical harm to University staff or participant as a consequence of the association of the study subject matter with organised criminality.

The above matters were brought to the attention of participants as appropriate at the earliest opportunity, and in any case prior to the commencement of any interview or other form of engagement, when agreement to participate was secured and recorded. It was therefore taken that in every case participation was fully informed and consensual.

The study was sponsored by a multi-national pesticide manufacturing company. This company had no influence over the design or practice of the research nor did they exert influence over the selection of participants. Moreover this thesis was written and is presented free from sponsor influence. The author had no previous relationship with, or residual obligation to, the study sponsor.

### **3.3 Identifying an appropriate methodology and research design**

The Intellectual Property Office (IPO) sponsored investigation into the efficacy of counterfeiting research considered in the literature review was critical of counterfeiting research where a narrow perspective of a problem is used as the foundation for response. The report proffers an alternative approach, founded upon a more eclectic attitude toward evidence gathering. It concluded that the product of a broader approach to data is a more reliable picture of the problem, at least when compared to that achieved by single-strand studies (Collopy et al., 2014). Whilst the IPO report endorsed this general strategy it did not propose a standard approach to counterfeit research, concluding that there is no formulaic 'one size fits all' set of methods for assessing the counterfeit threat across all business sectors. However, it did favour a general framework for research which included cross-referencing data across and beyond the core manufacturing industry. The IPO described this as a 'blended approach', suggesting that drawing upon multiple sources was more likely to



capture the true nature of a counterfeiting problem than industry generated occurrence data alone<sup>14</sup>. In research terms this blended approach is most closely akin to a mixed methods enquiry.

Mixed methods research has been variously described but, for the purposes of this study, the definition of “those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words), where neither type of method is inherently linked to any particular enquiry paradigm” is sufficiently comprehensive (Creswell & Clark, 2011, p.2). As Creswell and Clark (2011, p.8) suggest this is an appropriate approach to research questions when “one data source may be insufficient” reflecting the IPO justification for their blended approach. Moreover whilst qualitative research and quantitative research each have their own limitations (the limitations of quantitative research in this context having already been discussed at length) in combination they can “provide a more complete understanding of the research problem than either approach by itself” (Creswell & Clark, 2011, p.8), each at least partly offsetting the weaknesses inherent to the other.

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<sup>14</sup>In recommending a blended approach to research the IPO also advocated what might amount to a quality assurance framework. It was suggested that:

- Research should be carried out by trusted third parties who are independent of vested interest;
- Research should be based on transparent and comparable methodologies;
- Any quantitative methods utilised must be designed to ensure validity and reliability by allowing for replicability;
- Any study should disclose who commissioned the research;
- That the research be repeated on a regular basis to overcome issues of random uncertainty and to maintain statistical independence.

This study adhered to the first four of these criteria but the final one remains an aspiration being essentially beyond the scope of a stand-alone study.

Opting for a mixed methods approach is not a singular decision for it is a term that embraces a broad typology of research design, as recognised and described by Creswell et al. (2003). It was therefore necessary to consider which design would be most appropriate to this study. Creswell and Clark (2011, pp.63-68) suggest that there are four key decisions to be made when deciding which mixed methods design is appropriate for any given study:

- i. *Determining the level of interaction between the quantitative and qualitative strands* – the extent to which quantitative and qualitative strands of the study are kept independent or interact with each other. In this study the strands had to be mutually supportive and therefore interactive;
- ii. *The priority of quantitative and qualitative strands* – requiring an implicit or explicit decision about the relative importance of each strand within the study design. Here the ‘newness’ of the subject was an important factor for it could not be reasonably anticipated from which strand of the research significant findings would emerge. The study therefore had to afford equal priority to each strand;
- iii. *Determining the timing of the quantitative and qualitative strands* – the temporal relationship between the two both in terms of data collection. In this study concurrent timing was appropriate because this enhanced the likelihood of cross-fertilisation between strands during the course of data gathering thus prompting further research;
- iv. *Determining where and how to mix the quantitative and qualitative strands* – the point in the research process when the interactive relationship between the two strands is implemented. The study made use of SPSS Statistics software for the analysis of quantitative data and NVivo QDA software for the analysis of

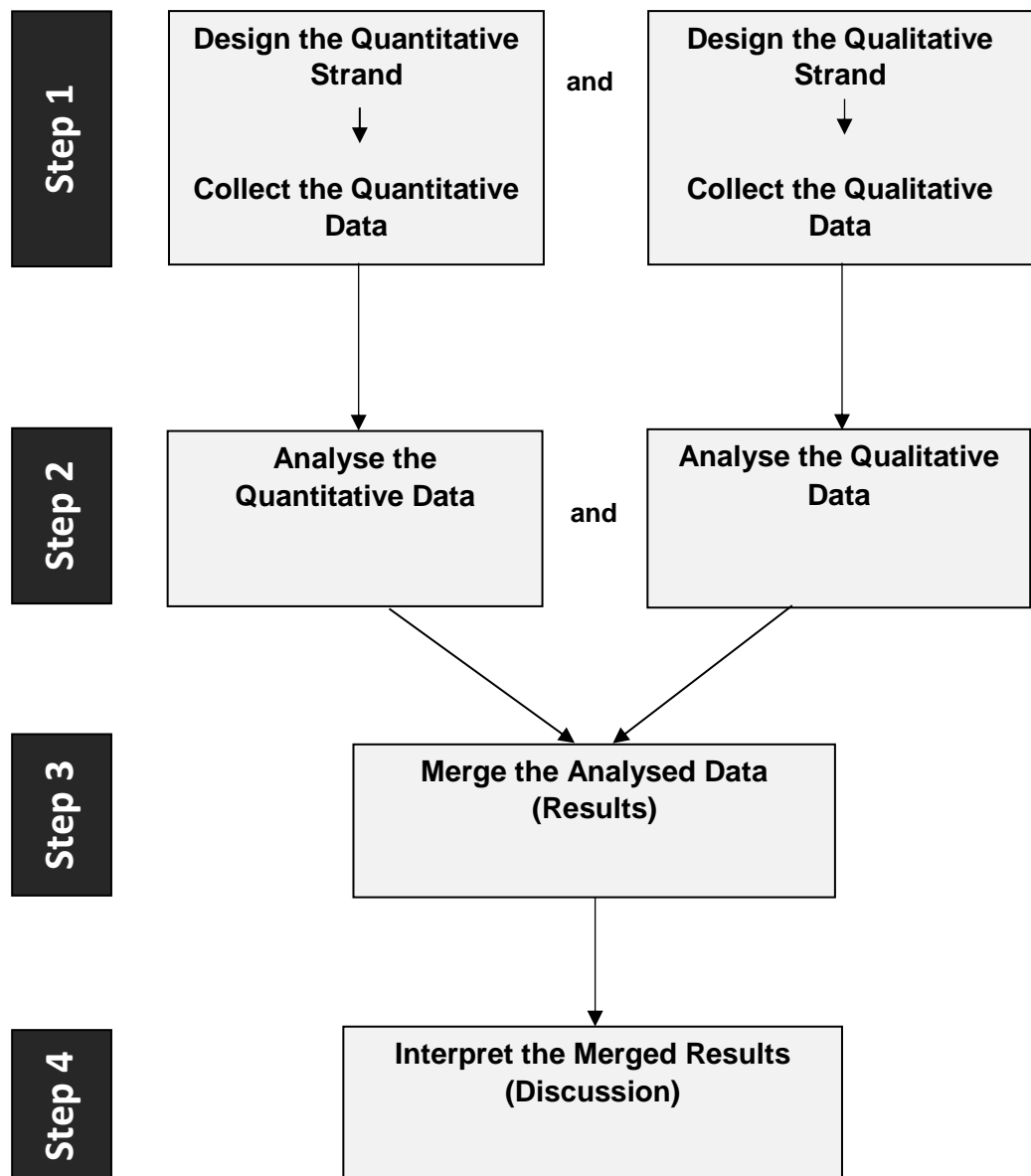
qualitative data<sup>15</sup>. These software packages do not have facility for real-time merger of the data they produce. In practice this mattered little for it was necessary to merge the data after separate analysis but before interpretation, each and every research strand therefore being drawn upon to produce the richer picture described in the IPO report.

On overlaying these key decisions onto the six common mixed method study designs described by Creswell and Clark (2011, pp.69-72) the one that most accurately reflected the interaction, priority, timing, and mixing requirements of this study was a Convergent Parallel Mixed Method (CPMM) design. The primary purpose of this approach is to obtain different but complementary data on the same topic and by synthesising the results “to develop a more complete understanding of the phenomenon” (Creswell & Clark, 2011, p.77). This was a strategy that was entirely compatible with the IPO blended approach. The design follows a distinct four-step process, as shown in Figure 3.1, which involves the concurrent collection of quantitative and qualitative data, the results of the various strands of data gathering then being independently analysed before being merged. In this study it was at the point of merger, when all of the data was available, that the research objectives were addressed.

In formulating an approach to the research based on the prototypical convergent parallel mixed method described above foremost in mind was that it had to serve two distinct functions. Firstly to address the study objectives by way of the gaps in the literature identified in the review, and secondly to include, as far as was possible, all significant stakeholders in the UK counterfeit pesticide problem. Secondly to

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<sup>15</sup> The use of these two proprietary data analysis software packages is described in sections 4.2.1 and 4.2.2 of the thesis.



**Figure 3.1:** Flowchart showing the steps in implementing a convergent parallel mixed method research design. Adapted from Creswell & Clark (2011, p.79).

ensure that the research conformed to the ethos of the IPO blended approach and specifically their recommendation that evidence should be gathered from victims, consumers, and relevant government departments (Collopy et al., 2014). In the context of this study these model groups were most closely represented by:

- i. Pesticides manufacturing industry victims;
- ii. Farmer consumers and other businesses and representative bodies associated with or operating within the pesticides market;
- iii. Pesticide regulation and relevant legislation enforcement agencies.

Returning to the design outlined in Figure 3.1 the thesis now continues by describing the first step in this process, designing the qualitative and quantitative research strands, which includes how evidence was gathered from each of the stakeholder groups described above.

## **4.0 The research design**

To achieve the study objectives stated in the introduction to this thesis a series of research questions were proposed which reflected the study objectives in a data friendly format. These questions, the associated methods of data collection and analysis, and the data strand within which they fell, are shown in Table 4.1. Collectively this constituted the first step in the convergent parallel mixed method. The rationale behind the choice of each data gathering and analysis method and the means by which they were employed are now described.

### **4.1 Data gathering methods**

#### **4.1.1 In-depth interviews**

Whilst the literature pertaining to counterfeit pesticides in the UK marketplace is methodologically weak it is sufficiently profuse to be reasonably confident that the problem is probably real. This element of the research was therefore intended to explore the nature of the problem as it occurs in the UK setting (research Q.1). This was achieved by way of a series of in-depth interviews conducted across the subject groups described in the introduction to data gathering. The same research method was also used to explore where, in so far as it impacts upon the counterfeit pesticide problem, the police rural policing focus lies (research Q.5), a question that was intrinsically linked to research questions 4, 6, and 7 which are discussed elsewhere.

In research terms this was essentially a descriptive strategy, an approach that has been widely endorsed where the objective is to 'paint a picture' of a crime (see for example Semmens, 2011). At a practical level, and as Ouchi (2004, p.2) suggests, in circumstances such as this where there is an absence of empirical data in order to

**Table 4.1:** Summary of the research questions and the corresponding data collection and analysis methods employed in the research.

Research question	Qualitative or Quantitative strand	Data collection and analysis method
1. What is the nature of the UK counterfeit pesticide problem as it manifests itself in the UK setting?	Qualitative	In-depth interviews
		Constant comparison
2. Is there indication of an occurrence pattern or trend in the UK marketplace?	Quantitative	FoIA requests
		Narrative summary <sup>16</sup>
3. Can a case study example of a counterfeit pesticide being used on a UK farm be identified and described?	Qualitative	Oral history interview
		Narrative summary
4. Is the crime recognised nationally in police force rural crime policy/strategy?	Qualitative	FoIA requests
		Constant comparison
5. Assuming that this crime is not recognised at a strategy/policy level where does the police rural crime focus lie?	Qualitative	In-depth interviews
		Constant comparison
6. Is the prevailing police strategy/policy reflected at an operational level?	Quantitative	Online alerts
		Word cluster analysis
7. What is the awareness level of this crime amongst police officers/staff?	Quantitative	Awareness survey
		Statistical
8. If the police have not engaged with this crime is it being dealt with elsewhere?	Quantitative	FoIA requests
		Narrative summary

<sup>16</sup> Whilst this particular strand of the research was quantitative in design the resulting data necessitated a narrative summary. This is discussed further in the associated method description.

paint that picture the use of expert opinion is “critical, and often inevitable”. This study drew upon this assertion, initially looking to identify the primary features of the UK counterfeit pesticide problem by exploring the attitudes, perceptions and knowledge of those closest to the problem.

Having determined that this was an appropriate strategy it was necessary to define what was meant by the term ‘expert’ in this context, the term being somewhat subjective. Nonetheless for the purposes of this study it was taken to mean an individual considered by the organisation they represent to be an authoritative voice on the subject and one who may fairly represent the corporate or collective view of that organisation. Given that ultimately the ambition for this thesis was that it should make recommendations to reduce the risk posed by counterfeit pesticides, and that those recommendations would most likely influence corporate policy, it was also deemed appropriate to reflect this in the sample. The participant stakeholders were therefore also all individuals who, where it was relevant, were in a position to determine, or at least significantly influence, policy and/or strategy associated with this issue within their own organisation or company.

In the course of refining this definition it became evident that whilst this was a pragmatic approach to subject selection it still left a number of issues that had to be addressed before deciding upon an appropriate data gathering method, namely:

- how to identify and achieve access to key stakeholders in the counterfeit pesticide problem;
- what measures to put in place to negate the possibility of any external accusation of anti-competitive practice<sup>17</sup>;

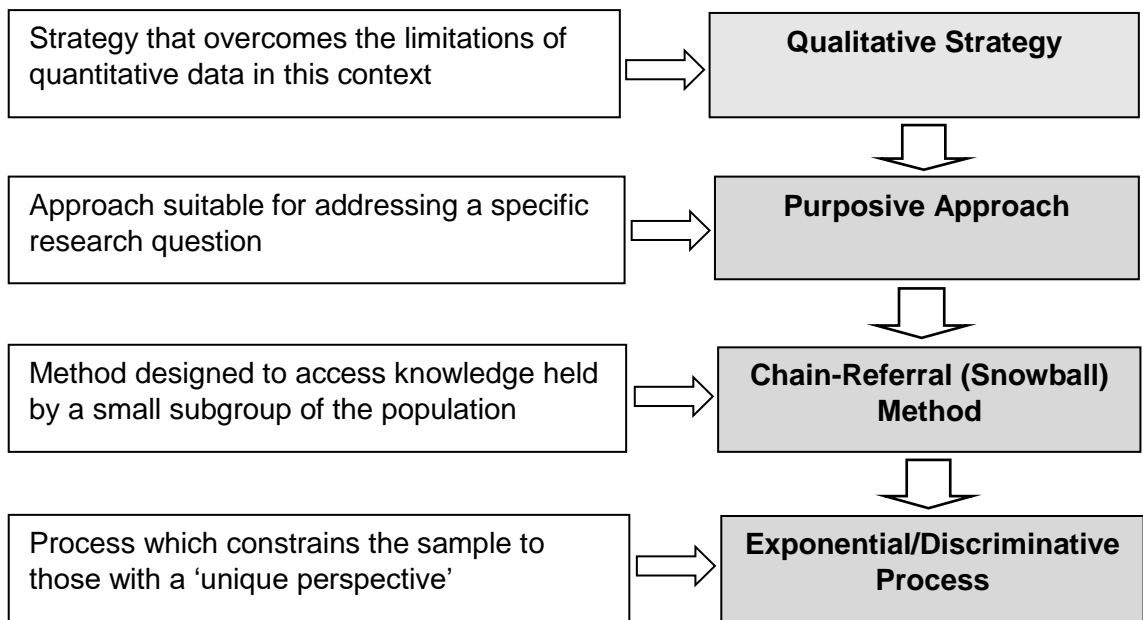
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<sup>17</sup> In the UK anti-competition practices are prohibited under Chapters I and II of the Competition Act 1998 (Office of Fair Trading, 2005). It became clear in the scoping stage of this study that



- how to accommodate a likely desire for anonymity on the part of participants<sup>18</sup>.

With these issues informing the choice of sampling method a staged process of selection was undertaken as illustrated in Figure 4.1. At each stage of this process various options were considered, the most appropriate (or least problematic) being selected before progression to the next stage.



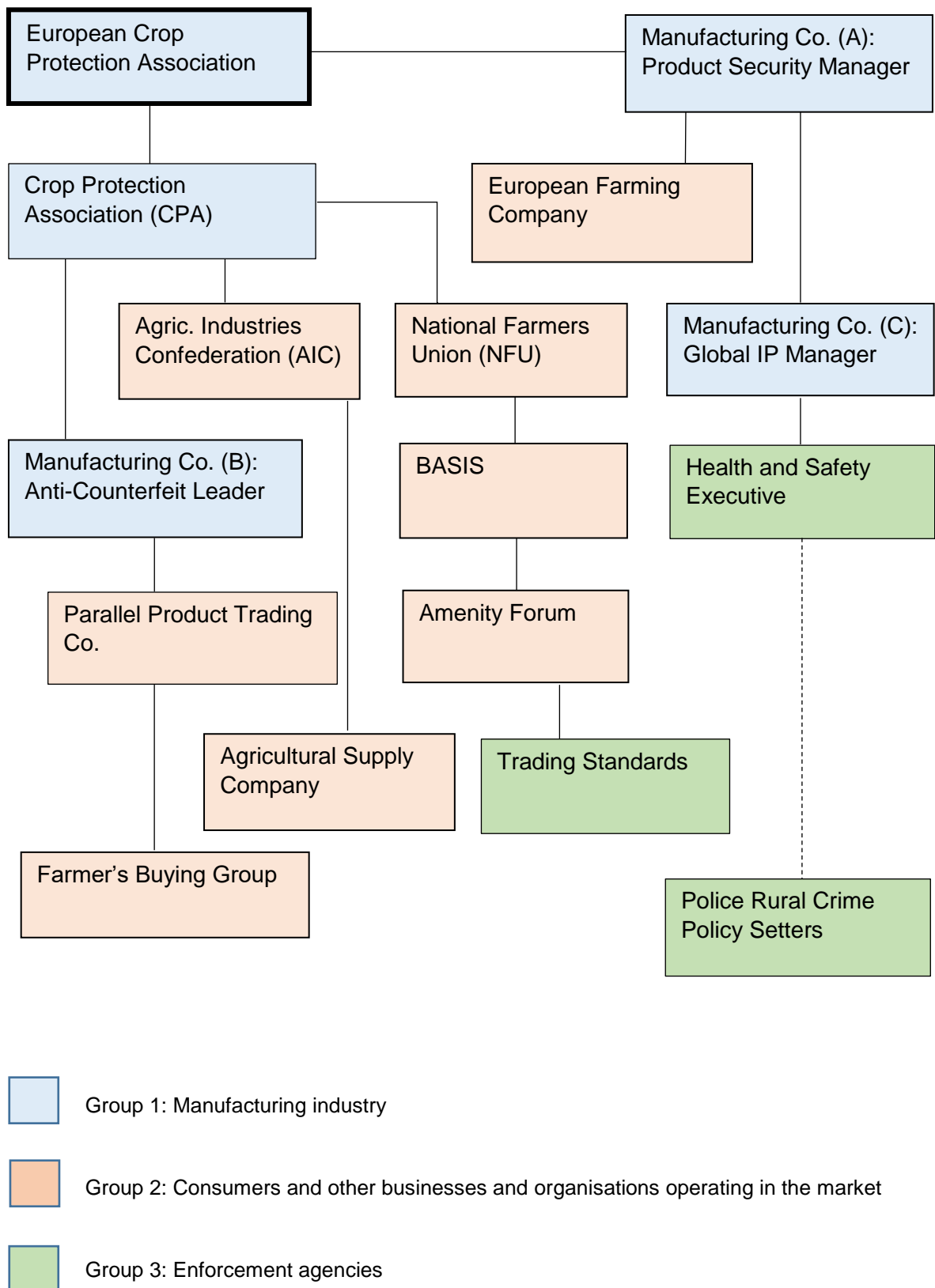
**Figure 4.1:** Method selection process for the in-depth interview phase of the research

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avoiding any accusations of acting contrary to this legislation was a major concern for stakeholders and one that would have to be addressed to secure industry representative agreement to participate.

<sup>18</sup> The question of anonymity is dealt with in the ethics statement given at section 3.2 of the thesis.

Ultimately the most appropriate non-probability sampling technique was deemed to be a discriminative chain-referral method, an approach that met each of the selection step criteria whilst accommodating the previously stated practical concerns. Popularly described as 'snowball sampling' the practices adopted in this phase of the study were based upon the methods and guidance provided by Biernacki and Waldorf (1981). Beginning with a subject who was known to meet the expert criteria, the so called anchor-interview, this non-probability technique facilitated access to a population that would be difficult to access using a random sampling method. The sample was then progressed either by way of the participant nominated recruitment of individuals who met the eligibility criteria and who were willing to participate or, where no contact was provided but as a result of an interview a likely corporate or organisational source of an original perspective was highlighted, by way of a suitable interview candidate identified by the researcher. For this process to work in practice it was imperative that the anchor-interview subject had a suitable level of subject expertise and an extended peer contact group. At the same time it was deemed important to go 'back to source'. That is to say to begin the research where the review of the literature suggested the primary source of the current narrative had its origins, this being the European Crop Protection Association (ECPA). In doing so it was acknowledged that whilst ECPA reporting may have been the best available source of information on the subject the review had been somewhat critical of this organisation's reporting of the counterfeit pesticide problem. It therefore seemed only fair that their position should be understood before embarking on a fresh investigation. Moreover the undoubted subject knowledge and breadth of contacts held by the Association made it a natural anchor point to begin the snowball process. The ECPA was therefore used as the anchor point with the full extent of this snowball sampling process being shown in Figure 4.2.



**Figure 4.2:** Progression of snowball sampling showing the organisations accessed colour coded to indicate to which subject group they belong.

In terms of the style of interview employed the primary influencing factor was that this was an exploratory phase of research with no certainty as to what themes may emerge. This naturally lent itself to the use of the semi-structured interview, that is to say one where the interviewer is guided by an interview schedule but has some latitude to vary questions to build rapport with the interviewee and explore areas of interest (Yates, 2004), or to ask additional questions in response to significant replies (Bryman, 2001). The interview schedule used in this study followed the initiation questions, probes, and follow-up questions convention as described by (Yates, 2004) and may be found at Figure 4.3<sup>19</sup>. This particular interview method carries distinct advantages over a more structured alternative if used in the right context. As Yates (2004) suggests the technique:

- is flexible, in that questions may be tailored to address ongoing concerns and to consider issues that may not have been considered at the outset;
- allows for the exploration of complexity, ambiguity, contradictions and process;
- can explore the potential meanings of answers and the perspective of the respondent.

The conduct of the interviews, in terms of style and question phraseology, owed much to the work of Merton et al. (1990). Their guidance on conducting the focused interview, and in particular an emphasis on the practice of “continuously assessing the interview as it is in process” (p.11), proved invaluable<sup>20</sup>. By carrying out these semi-

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<sup>19</sup> There was one notable exception to general use of semi-structured interviews, this being the interview with a farmer victim of counterfeit pesticides. This, including the reason for an alternative interview method, is described at section 4.1.3 of the thesis.

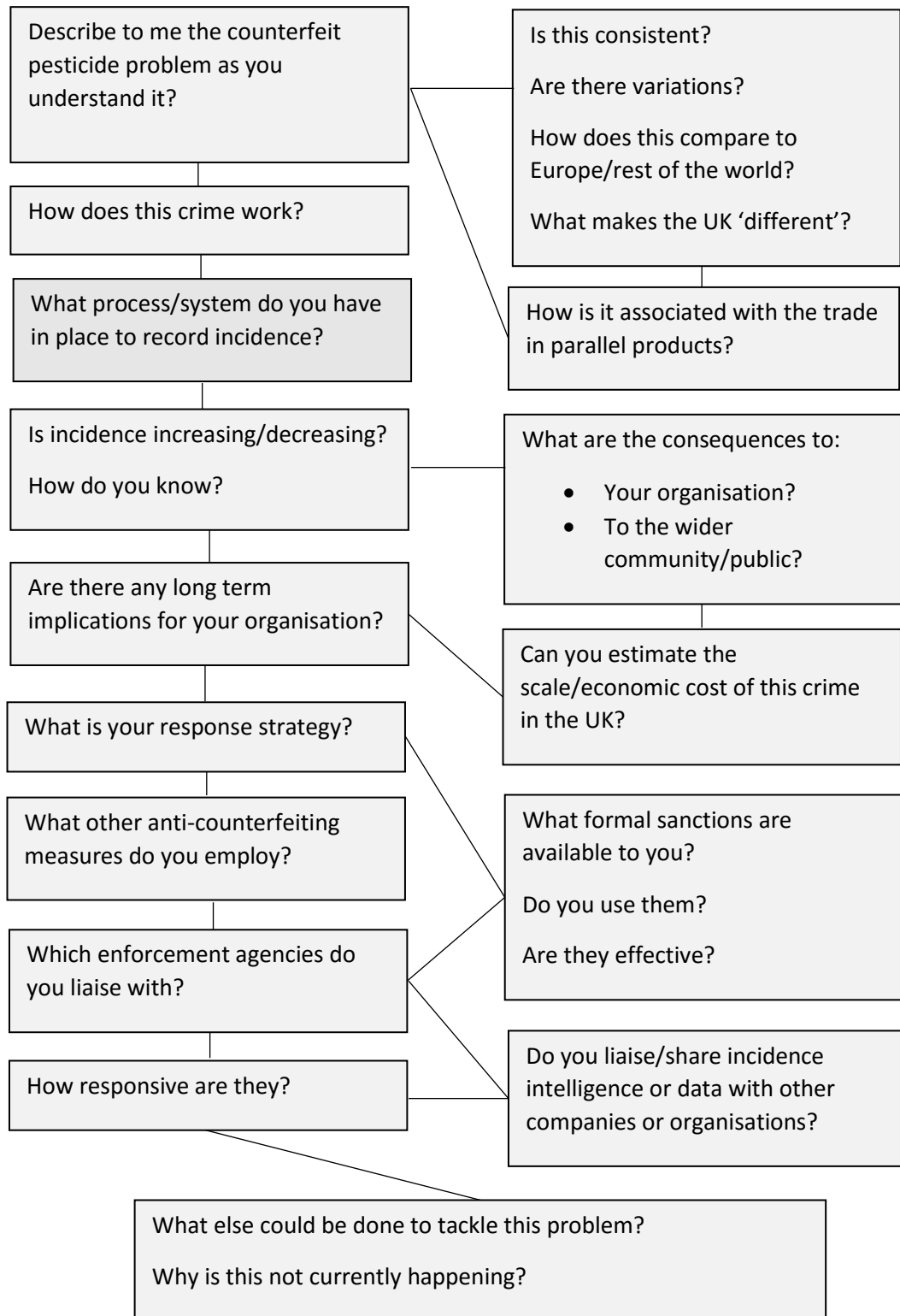
<sup>20</sup> Many books have been written on interview technique since Robert Merton and his colleagues first published their guidance in 1956, a number of which were considered in the course of selecting a suitable research method for this study. It is the opinion of the author that

structured interviews on a one-to-one basis in a private setting the method overcame any issues of individual subject anonymity and minimised the risk of there being any external suggestion of industry collusion.

This method of data collection made it possible to carry knowledge forward from participant to participant, allowing the scope and focus of individual interviews to be varied in response to recognised gaps in the data, thus building an ever richer picture of the subject. Moreover, and again adding to the richer picture, by gathering data using this expansive method the sample progressively diversified to include various associated interest groups and organisations across the three study subject categories, indicated by way of colour-coding in Figure 4.2. This diversification both diluted any inherent core industry bias that may have characterised the initial anchor-sample and gave the alternative perspective that the study sought across the majority of subject groups. However, it became apparent in the course of this phase of the study that the relationship between the core industry / associated bodies and some enforcement agencies, notably the police, was such that no appropriate expert contact would be forthcoming using the snowballing method employed. In figure 4.2 this is shown by a dashed rather than a solid link indicating that it was suggested by an interview subject that the police were stakeholders but that they could not nominate a suitable contact. This was unsurprising given the findings of the scoping phase of the study where a disconnect between the police and this crime problem was observed. This necessitated a separate means of engaging with the police in order to determine their relationship with the counterfeit pesticide problem.

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this ground-breaking work has not been bettered and that it remains the primary source for those conducting interviews designed to elicit subject attitudes.



**Figure 4.3:** In-depth interview schedule

Dialogue was entered into with the Chief Constable's office of a subject police force to identify those individuals occupying senior roles who were responsible for the setting of rural crime policy and strategy. As Hagan (2002) suggests occasionally it may be appropriate to select a sample on the basis of knowledge of the population and the nature of the research aims. Such purposive, or judgmental, sampling was entirely appropriate in this instance as it was the only practicable route to those at the heart of rural policing policy setting. It is worth noting that interviews with these subjects, being purposive, did not follow the schedule given in Figure 4.3. The interviews remained semi-structured in nature but the questions were specifically designed to address the matter of police policy setting. The relationship between the researcher and this subject police force is discussed at Appendix 1.

Material was gathered by way of these in-depth interview methods until no new information of direct relevance was forthcoming from this cross-section of subject expertise. In total twenty two stakeholder opinions were documented, amounting to over forty five hours of face-to-face subject contact. In addition notes were taken during preliminary discussions, necessary in every case to reassure participants of the validity, purpose, and integrity of the study and to determine subject qualification and suitability. Follow-up questions were addressed by way of email and documented telephone conversation. With a few exceptions, where the subjects declined to be recorded and the detail of the interview was captured by way of contemporaneous notes, interviews were digitally recorded and then manually transcribed to qualitative data analysis software (QDAS) along with any contemporaneous notes, and any notes relating to subsequent conversation or written exchange.

The importance of also capturing those elements of non-verbal communication which, as Onwuegbuzie et al. (2010, p.699) describe, "can be important for attaining a deeper shared meaning, in which both the interviewer and interviewee increase their

awareness of the contextual nature of the voice” was also recognised. However, the capacity to do so was somewhat limited by the recording system employed in interviews being audio rather than video. As a consequence any relevant gestures had to be captured in the form of contemporaneous notes. Moreover because the research did not stretch to having a second interviewer/note-taker present the chosen method had to allow the sole interviewer to carry out this process without unduly impinging upon the flow of the interview. In the circumstances the use of a comprehensive but complex matrix approach for capturing multiple elements of non-verbal communication, such as those described by Onwuegbuzie et al. (2010), was simply out of the question. Nonetheless the general principle was deemed appropriate and a simplified version was developed for the purposes of the study. The objective of the resulting matrix was to simultaneously capture in a simple and unobtrusive manner both facial expressions and symbolic gestures indicative of the range of emotions described by Cole (1971). The technique required the use of the matrix given at Table 4.2 as an integral part of the interview process<sup>21</sup>. The table was used in conjunction with the ‘T-mark’ facility on the proprietary digital recorder used for all sound recordings made in the course of the study<sup>22</sup>. At the point at which a facial expression or physical gesture was employed by the interviewee a T-mark was made on the recording and the sequential number indicated on the recorder was noted on the matrix table in the appropriate column/row. The completed matrix therefore provided a record of non-verbal communication which could then be related back to a specific time point in the interview and therefore noted in transcription.

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<sup>21</sup> The work of Onwuegbuzie et al. (2010) is acknowledged, the simple matrix used in this study drawing inspiration from the more comprehensive approaches they describe when considering innovative data collection strategies that may be applied in qualitative research.

<sup>22</sup> The digital recorder used throughout the study was a Sony ICD-PX312.



A number of practice interviews were conducted ahead of the research to test the efficacy of this method. This demonstrated that, with some practice, the technique could be used in the course of a normal conversation. The only addition to the original design that was found to be necessary was the addition of a simple + or – alongside the T-mark to indicate if the facial expression or physical gesture was affirmative or negative where, in the context of the conversation, this was possibly in doubt.

**Table 4.2:** Matrix for recording non-verbal communication in in-depth interviews showing typical notation.

Emotion	Facial Expression (T-mark +/-)	Physical Gesture (T-mark +/-)
Happy	4	
Sad		
Angry	1	
Fearful		
Disgusted		3-
Surprised	2+, 5	
Other <sup>a</sup>		

<sup>a</sup>Emotions recorded as ‘other’ would include excitement or contempt.

Whilst the data captured using the matrix table was rudimentary, only recording that non-verbal communication had occurred and what emotion it indicated rather than the specific detail of that communication, it still proved useful in the subsequent analysis of the data particularly where clarification of meaning or intent was needed. The analysis of this and other qualitative data is discussed in section 3.3.6.

#### 4.1.2 Freedom of Information Act requests

The use of provisions contained within the Freedom of Information Act (FoIA)<sup>23</sup> as a means of acquiring materials held by public authorities for the purpose of research is a comparatively new tool available to researchers. In this study these provisions were used to address three research questions; whether there was any indication of an occurrence pattern or trend for counterfeit pesticides in the UK marketplace (research Q.2), if this crime is recognised nationally in police rural crime policy or strategy (research Q.4), and lastly if the police have not engaged with this crime is it being dealt with elsewhere (research Q.8)?

In the comparatively few years since the provisions of the FoIA became available in 2005 they have become recognised as powerful research instruments but ones that perhaps have yet to have their full research potential harnessed (Savage & Hyde, 2014). Understanding the powers that the FoIA extends to citizens, and the limitations in terms of the extent of disclosure and the use of materials that disclosing bodies may impose, is a discipline in its own right. This study is therefore indebted to the work of Brooke and Hislop (2006) for their general guidance on the Act and to Bourke et al. (2012) for their work on the use of FoIA by academic researchers. As a means of gathering data FoIA requests share some of the characteristics of online surveys, a method used elsewhere in this study. However, where they perhaps differ is in the degree of clarity and specificity required in the questions asked; a poorly worded

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<sup>23</sup> The Information Commissioner's Office (2015) describes the Freedom of Information Act 2000 as one that provides public access to information held by public authorities in two ways:

- public authorities are obliged to publish certain information about their activities; and
- members of the public are entitled to request information from public authorities.

This provision applies to public authorities in England, Wales and Northern Ireland, and by UK-wide public authorities based in Scotland (The Information Commissioner's Office, 2015). A similar provision exists in Scotland and is contained within The Freedom of Information Act (Scotland) Act 2002.

**Table 4.3:** Public authorities subject to FOIA requests indicating whether those requests related to the qualitative or quantitative strands of the research

<b>Subject Agency</b>	<b>Quantitative</b>	<b>Qualitative</b>	<b>Request directed to:</b>
<b>Police</b>	<b>Yes (all forces)</b>	<b>Yes (all forces)</b>	Avon and Somerset Constabulary
			Bedfordshire Police
			Cambridgeshire Constabulary
			Cheshire Constabulary
			City of London Police
			Cleveland Police
			Cumbria Constabulary
			Derbyshire Constabulary
			Devon and Cornwall Police
			Dorset Police
			Durham Constabulary
			Essex Police
			Gloucestershire Constabulary
			Greater Manchester Police
			Hampshire Constabulary
			Hertfordshire Constabulary
			Humberside Police
			Kent Police
			Lancashire Constabulary
			Leicestershire Police
			Lincolnshire Police
			Merseyside Police
			Metropolitan Police Service
			Norfolk Constabulary
			North Yorkshire Police
			Northamptonshire Police
			Northumbria Police
			Nottinghamshire Police
			South Yorkshire Police
			Staffordshire Police
			Suffolk Constabulary
			Surrey Police
			Sussex Police
			Thames Valley Police
			Warwickshire Police
			West Mercia Police
			West Midlands Police
			West Yorkshire Police
			Wiltshire Police
			Police Scotland
			Dyfed-Powys Police
			Gwent Police
			North Wales Police
			South Wales Police
			PSNI
<b>Trading Standards</b>	<b>Yes (all councils)</b>	<b>No (all councils)</b>	Bracknell Forest Council
			Buckinghamshire County Council
			Milton Keynes Council
			Oxfordshire County Council
			Reading Borough Council
			Royal Borough of Windsor & Slough Borough Council
			West Berkshire Council
			Wokingham Borough Council
<b>CRD</b>	<b>Yes</b>	<b>No</b>	Health and Safety Executive
<b>Border Force</b>	<b>Yes</b>	<b>No</b>	Home Office

survey question may illicit correspondingly poor data but a poorly worded FoIA request may simply be refused by the subject authority (Bourke et al., 2012). It is, in that sense, a highly focused mode of data gathering.

In this study FoIA requests were used to support both the quantitative and qualitative strands of the research where the questions could be addressed using information held by public authorities that are covered by the legislation, as listed in Schedule 1 to the Act (The National Archives, 2015). The authorities that were subject to FoIA requests are shown in Table 4.3, along with an indication as to whether the information they provided was used in support of just the quantitative or both the quantitative and qualitative strands of the study (none being used exclusively for qualitative research). All FoIA requests were made in accordance with government process guidelines (HM Government, 2015).

FoIA requests within the qualitative strand of research were designed to examine the extent to which police forces have considered what constitutes 'rural crime' and whether any associated policy or strategy is sufficiently inclusive to accommodate the counterfeit pesticide problem (research Q.4). Given the focus of these questions these FoIA requests were sent to police forces only, as indicated in Table 4.3, who were asked the following:

- 1. Does your police force have a definition of 'rural crime' that it works to? If yes what is that definition?*
- 2. Does your police force have a specific rural crime policy or strategy? If yes please provide me with a copy of that policy or strategy. If this is not possible please tell me why and indicate whether that policy or strategy makes specific mention of counterfeit plant protection products (pesticides).*

The resulting data was extracted and coded for analysis using proprietary Qualitative Data Analysis Software (QDAS). The method of analysis employed is discussed in section 4.2.1 of the thesis.

In the quantitative strand of the research FoIA requests were used firstly to identify if the data held by the various enforcement agencies with an interest in counterfeit pesticides showed any trend in UK incidence over a specified time period (research Q.2). Secondly this element of the study also provided the opportunity to determine whether, if it transpires that this crime is not being addressed by the police, it is being dealt with elsewhere (research Q.8). To these ends the authorities indicated in Table 4.3 were asked to provide the following data:

- 1. The number of separate incidents or suspected incidents involving counterfeit pesticides which were investigated by [authority name] in each of the calendar years from 2010-2014 inclusive;*
- 2. The total quantity (by weight or volume) of counterfeit or suspected counterfeit pesticide seized by [authority name] in each of the calendar years 2010-2014 inclusive.*

It is important to note that this was not an attempt to estimate what proportion of the pesticides sold in the UK are counterfeit, the problems of the quantitative 'absolute percentage' research route having already been noted in the review of the literature. Rather this 'occurrence' element of the study was intended to establish if any pattern of incidence over the period since 2010 could be established<sup>24</sup>.

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<sup>24</sup> The time period of the FoIA requests was not arbitrary rather it reflected what was likely to be the minimum length of time that the public bodies involved would have retained data. Principle 5 of the Data Protection Act 1988 requires that those subject to the Act do not keep information

The various organisations approached with this FoIA request reflects the fact that this is a multi-faceted crime with different authorities carrying responsibility for separate aspects of illegality. Whilst this diversity of responsibility was acknowledged in the introduction to the thesis to better understand this element of the research it is worth further exploring how each agency fits into the enforcement jigsaw;

- Police involvement recognises that besides anything else counterfeiting is an act of fraud often perpetrated by organised crime groups. Whilst the police engagement with counterfeiting is discussed in the literature review it is worth noting that there is seemingly a new found recognition of the policing significance of this crime, well-illustrated by the Intellectual Property Office funding of the City of London Police to bring their longstanding expertise in investigating fraud to bear on the problem<sup>25</sup>;
- Trading Standards are probably the organisation that the general public most closely associate with tackling the problem of counterfeit goods, having as they do an eclectic mix of associated responsibilities primarily derived from consumer law. As the primary agency with responsibility for maintaining a fair and safe living and trading environment for consumers and businesses they

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for any longer than is necessary. Whilst the police generally keep information for seven years (under the national guidance given in the Management of Police Information document) there is considerable variation amongst other public bodies. Had the time period selected exceeded their retention policy it would have given scope for the request to be refused and therefore a period of four years was chosen because this fell within all retention policies.

<sup>25</sup> The Police Intellectual Property Crime Unit (PIPCU) is a specialist unit dedicated to tackling “serious and organised intellectual property crime” (City of London Police, 2015). The unit’s primary focus is on counterfeiting offences committed using an online platform; this includes pirated DVDs, CDs and computer software. Whilst the ‘catch-all’ FoIA request to police forces included the City of London Police a separate request was made to this force requesting data concerning incidents of the counterfeiting of pesticides that had been dealt with by PIPCU since it became operational in September 2013.

both respond to complaints and actively seek out counterfeit items. Because of their close association with the counterfeiting problem Trading Standards were also included in the qualitative phase of the study as a significant stakeholder<sup>26</sup>;

- The Health and Safety Executive, or more specifically the Chemicals Regulation Directorate (CRD – a subdivision of the former) is the body specifically charged with regulating plant protection products authorised for sale, supply, use and storage in the UK. All pesticides must be authorised by the Chemicals Regulation Directorate before they can be sold and supplied for use in the UK. CRD would therefore engage with the counterfeit pesticide problem because these are products that, by definition, are not approved and therefore contrary to regulation. As with Trading Standards because of their close association with the problem the Health and Safety Executive were also included in the in-depth interview phase of the study;
- The UK Border Force is the law enforcement command within the Home Office and, amongst other things, is responsible for customs controls over goods entering the UK. Their relationship with counterfeit pesticides is less easy to define than the other key agencies but one of their priorities is to deter and prevent individuals and goods that would harm the national interest from entering the UK. The status of a counterfeit pesticide entering the UK is

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<sup>26</sup> In practice engagement with Trading Standards in the qualitative strand of the study preceded the quantitative FoIA request phase. In the course of the stakeholder interviews it became apparent that Trading Standards held no information on their national recording system with regards to counterfeit pesticides, essentially pre-empting any FoIA request. Given the disparate nature of Trading Standards, being located as separate units within numerous local authorities, undertaking a comprehensive FoIA request would have been a time consuming exercise which the qualitative phase of the research suggested would produce a nil return. For this reason this element of the study was treated as a dip-sample taking in all of all Trading Standards departments within the sample police force area with a view to expanding the survey if the results suggested that the indications of the quantitative data had been wrong.

problematic, at least until an attempt is made to place that product onto the market (particularly if that product is separated into its constituent parts such as active ingredient, packaging, and labelling when entering the UK).

Nevertheless, given their customs and revenue related powers and the duty evading nature of counterfeit goods they frequently engage with such goods at their point of entry into the UK.

It is also worth noting that there are various other peripheral offences relating to counterfeit pesticides, most notably amongst these being those associated with false declarations on shipping manifests<sup>27</sup>. A significant organisation in understanding the significance and scope of these misdemeanours, the ICC Counterfeiting Intelligence Bureau, was not subject to the FoIA request because it is not an authority listed in Schedule 1 of the Act but was included as part of the qualitative strand of the research<sup>28</sup>.

Returns from this quantitative strand of the research were almost universally nil, however, this in itself proved useful in research terms and is discussed further in section 4.2.2 which follows and in the relevant section of the results chapter.

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<sup>27</sup> The risks associated with falsely declared goods on ships manifests are well known; the low flashpoint of some chemicals makes them a serious hazard on board a container ship if they are not appropriately positioned for transit. The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1990 make specific reference to such goods.



<sup>28</sup> The ICC Counterfeiting Intelligence Bureau is a not for profit membership organisation formed in 1985 to undertake anti-counterfeiting activities in defence of industry interests. It has a particular interest in maritime crime which reflects the fact that it is run alongside an International Maritime Bureau which seeks out fraud and malpractice in international trade.



#### **4.1.3 Counterfeit pesticide case study; an oral history interview**

The objective of this element of the qualitative strand of the research was firstly to address a significant gap in the literature, no incident involving a counterfeit pesticide and occurring on a UK farm having been described the extent that it could reasonably be described as a case study (research Q.3), and secondly to provide a source of example when interpreting the collective data. Without such a case to use as a point of reference this thesis could have been seen as merely a reflection on a theoretical risk rather than a study of a 'real' crime problem.

The absence of a properly documented incident may be attributed to there having been, so far as it was possible to determine, no formal enforcement agency sponsored appeal for information. It also seemed likely that a degree of reticence on the part of victim farmers to come forward and discuss their experiences played a part, quite understandable given that there was a possibility that they may have been seen as culpable. For these reasons it was agreed with the police force supporting the study that a public appeal would be made for intelligence relating to this crime, backed with an assurance of anonymity for any farmer victim that came forward, in the hope that out of this would emerge a usable case example. The appeal, which was managed under the title of Operation Silo (Thames Valley Police, 2014), received considerable media coverage (see for example Bucks Free Press, 2014; Farm Business, 2014; Garvey, 2014). In addition an appeal leaflet was distributed through the force CountryWatch [sic] network, a copy of which is given at Figure 4.4.

## Illegal pesticides: An appeal for intelligence

Illegal pesticides, including counterfeits, are being found in increasing amounts across Europe. This includes the UK.

Thames Valley Police has an interest in illegal pesticides not just because of the risks they pose to our rural communities but the links to organised crime gangs. There is growing evidence that the illicit activities of such gangs finance other serious crimes such as human trafficking and international terrorism.

Please read the leaflet titled 'Do you know what you are buying?' The leaflet contains advice and useful tips to help you protect your business against illegal pesticides.

**If you notice anything suspicious about pesticides you have either been offered or purchased, please call the 24 hour non-emergency number 101 and mention 'Operation Silo'.**

Things to look out for:

- Does the product look or smell unusual?
- Have you been offered a product which has been described as the same as another but at a discounted rate?
- Have you been sold a product because your first choice was 'out of stock'?
- Do you have any feelings that a product you have bought isn't quite right?
- Is the packaging unusual or not what you would expect?

Please act on any suspicions you may have and call Thames Valley Police as soon as possible. If you do not want to speak to police, you can contact the independent charity **Crimestoppers** anonymously on **0800 555 111** or online at [www.crimestoppers-uk.org](http://www.crimestoppers-uk.org).



Figure 4.4: Thames Valley Police Operation Silo leaflet appealing for intelligence relating to illegal pesticides.

As a result of the appeal, and more specifically linked presentations made to farmer groups by the author, a number of individuals who suspected they may have encountered a counterfeit pesticide came forward. One of these, an individual referred to throughout the study as subject #18, volunteered as being willing to tell his story in full and to be recorded doing so provided he could be guaranteed anonymity in any subsequent published material. The resulting interview would best be described as an oral history interview. As Bryman (2001, p.316) suggests such interviews are useful when asking a subject to reflect upon specific historical events or periods. The interview was unstructured in character, the interviewee simply being encouraged to talk freely about his experience and invited to expand upon specific points of interest as they arose. As Davies et al. (2010, p.104) point out in the context of crime related research such unstructured interviews can produce “rich grounded data”. For this reason as well as the results of the interview being coded along with other stakeholder derived data this interview was also treated as an eye-witness account to be summarised and presented without further analysis or comment. This was done in such a way that, as far as was possible, it captured the “qualitative detail and complexity of response” that Hagan (2002, p.174) described as characterising unstructured interview data whilst ensuring subject anonymity. This account is used as a point of reference and example later in the thesis.

#### **4.1.4 Awareness survey**

To determine the relative levels of awareness of the counterfeit pesticide problem amongst police officers and staff (research Q.7) data was gathered using a web-based, closed-question survey. This survey compared police cognisance of the problem to two other subject groups; professional users of pesticides and group consisting of individuals with no professional interest in the problem. The purpose of

this strand of the study was, as Davies et al. (2010, p.143) describe, to “generate statistics to describe the characteristics of a population”. In this case the characteristic to be described was awareness of a specific crime problem amongst police officers and police staff working within forces with a significant rural community.

In seeking a representative sample for this population it was recognised that the extent to which the police have contact with a rural/farming community varies considerably between the forty-five forces in England and Wales, Scotland, and Northern Ireland; the extremes of a largely metropolitan force such as West Midlands Police compared to a largely rural force such as Devon and Cornwall being illustrative of this. Clearly there was little point in carrying out research into a predominantly rural problem within any force with a relatively small rural/farming population simply because a low level of awareness of that problem was not only very likely but also largely irrelevant. A qualifying criterion was therefore designed to discriminate in favour of forces with a significant rural/farming population.

This criterion depended upon the fact that the farmed land contained within the boundaries of individual police force areas could be treated as a single farming unit. This process of consolidation was achieved by using statistics relating to agricultural land usage in the United Kingdom published by Defra<sup>29</sup>, broken down by county and

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<sup>29</sup> The Department of Environment Food and Rural Affairs (Defra) is the UK government department responsible for policy and regulations on:

- the natural environment, biodiversity, plants and animals
- sustainable development and the green economy
- food, farming and fisheries
- animal health and welfare
- environmental protection and pollution control
- rural communities and issues

The department publishes national and official statistics relating to the environment, rural communities, food and farming (Defra, 2015). For comparable data reference was also made to

unitary body (Defra, 2014), and allocating each to their respective police force areas. The total land used for (a) arable crops and (b) permanent/temporary grassland within each police force area was then determined and the respective percentage of the sum of the two farming types within each force area was then calculated (% cropping and % arable permanent and temporary grassland for each force area). This allowed the forces to be ranked; at one end those with extreme percentages of land use for arable cropping and at the other those with a similar extreme of permanent and temporary grassland. For example toward one extreme was Cambridgeshire Constabulary (88.3% arable cropping / 11.7% permanent and temporary grassland) and toward the other was Avon and Somerset Constabulary (16.2% arable cropping / 83.8% permanent and temporary grassland). Out of this was extracted those forces that fell within the middle quartile range, essentially a select group of police forces who exhibited neither farming type extreme and therefore could be described as 'mixed farming' in profile (Table 4.4).

The significance of this group of forces was not recognised until the early phases of qualitative data gathering when it became apparent that counterfeit pesticides are not necessarily confined to one farming sector and, as importantly, they are not necessarily always present in the market place. These qualitative findings are discussed at length elsewhere sufficed to say at this point that one of the advantages of a mixed-method approach to research, that the results of one strand may guide the application of another, was of significant benefit here. The qualitative findings indicated that the chances of an individual force having experienced incidence of counterfeit pesticides, and by inference that they should be aware of this crime issue, was greater if their farming profile tended toward a mix of arable cropping and grassland based enterprise.

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Scottish Government derived data and the Northern Ireland Statistics and Research Agency agricultural census.

The natural extension of this premise was that the larger the total area of such mixed-farming within any given police force area then the greater the likelihood of the having being incidence and again by inference that there should be a measurable degree of awareness. A cursory examination of Table 4.4 showed that there was a great deal of variance in the total farmed area between those forces within the middle quartile range. Whilst all could reasonably be described as being mixed-farming in profile the total area of farmed land within some of the forces was such that it was rather unlikely that they would experience incidence (West Midlands Police and Metropolitan Police being prime examples).

**Table 4.4:** Middle quartile range of police forces ranked by percentage mix of arable cropping and permanent/temporary grassland (based on Defra data).

<b>Police Force</b>	<b>% Arable cropping</b>	<b>% Permnt/temp grassland</b>
Hampshire Constabulary	61.3	38.7
Warwickshire Police	60.0	40.0
Kent Police	59.6	40.4
Thames Valley Police	59.5	40.6
Leicestershire Police	57.6	42.4
Merseyside Police	56.4	43.6
Wiltshire Police	53.3	46.7
West Midlands Police	49.9	50.1
North Yorkshire Police	47.2	52.8
Gloucestershire Constabulary	46.8	53.2
Metropolitan Police Service	45.5	54.5
West Mercia Police	43.9	56.1
Dorset Police	40.5	59.5
Sussex Police	37.1	62.9

A second qualifying criterion was therefore applied and forces falling within the middle quartile were ranked again, this time to reflect their relative total area of arable cropping and permanent/temporary grassland (Table 4.5). Those forces that fell within

the upper quartile range of this new ranking were deemed most appropriate potential research subject forces. These then were those forces that were mixed-farming in profile and sufficiently large that they are likely to have experienced incidence and should, therefore, be cognisant of the problem.

In considering an appropriate subject force from within the upper quartile it is important to note that at the time of the study the author benefited from high level access to a large non-metropolitan police. This force met the qualifying criterion described above and, as a result of the existing relationship, was willing to support the study by facilitating access both to police officers and staff and to those charged with setting policing priorities. Whilst this force seemed an obvious candidate for research its choice did highlight an ethical dilemma; the question of being a researcher 'in the middle', the so called insider/outsider dichotomy (Breen, 2007; Dwyer & Buckle, 2009). Whilst this dichotomy is of greater significance in the context of the qualitative element of the study it is also relevant to the quantitative strand and is discussed in Appendix 1. In the light of this personal reflection it was concluded that although there were drawbacks to having a previous relationship these were outweighed by the advantages and it was appropriate for this to be the subject police force<sup>30</sup>.

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<sup>30</sup> The police force was Thames Valley Police, the largest non-metropolitan police force in terms of officers and staff in England and Wales with policing responsibilities for the counties of Berkshire, Buckinghamshire and Oxfordshire and associated Unitary Authorities.

**Table 4.5:** Mixed-farm profile police forces rearranged to reflect total area of arable cropping and permanent/temporary grassland indicating quartile range boundaries (based on Defra data).

<b>Police Force</b>	<b>Total area of arable cropping and permanent/temporary grassland (hectares)</b>
West Mercia Police	542,792
North Yorkshire Police	528,222
Thames Valley Police	353,799
Wiltshire Police	249,992
Hampshire Constabulary	208,682
Kent Police	196,768
Sussex Police	194,521
Gloucestershire Constabulary	191,282
Dorset Police	188,093
Leicestershire Police	180,406
Warwickshire Police	139,713
Merseyside Police	16,893
West Midlands Police	13,567
Metropolitan Police Service	9,994

For the purpose of comparison the data derived from this police force was considered alongside that derived from two other sample groups:

- professional pesticide users or those professionally engaged in the manufacture or distribution of pesticides;
- individuals who had no professional interest in pesticide manufacture, distribution or use and were not employed by an agency that enforces pesticide regulation or the law.

These two comparison groups were chosen because together they gave meaningful context to the results from the police sample; it would be reasonable to hypothesise that a sample of police officers and staff would be better informed about this crime problem than a group of what were essentially laypersons, but probably not as



informed as those with a professional interest in the subject. It was anticipated that the extent of police awareness when compared to these two groups would give a fair indication of relative subject cognisance.

The chosen survey method was influenced by the relative inaccessibility of both police officers and staff and professional pesticide users, this by virtue of their distribution across a large police force area<sup>31</sup>. As a consequence the resources that would be required to conduct a meaningful number of face-to-face interviews essentially excluded this as viable survey mode. Similarly telephone interviews were also excluded because achieving an acceptable sample size by this method was prohibitively expensive. Moreover concerns on the part of the subject police force surrounding the potential security implications of disclosing the home or workplace addresses of a large number of police officers and staff rendered a postal survey untenable. This left a web-based survey as the only pragmatic mainstream survey mode available.

This forced constraint on the available survey method did not necessarily disadvantage the research. The value of a survey when used in this context lies in its capacity to “gather large amounts of data to reveal the extent of a phenomena” (Davies et al., 2010 p.145). However, this is a research method with well recognised limitations; surveys, by their very nature, only record expressed or claimed behaviour (Hagan, 2002) and in that sense they have no inherent truth. Nevertheless, in circumstances such as this where, by virtue of the question being asked there is an implied challenge to professional ability or knowledge, the anonymity provided by an impersonal survey can go some way to overcoming a desire on the part of a professional respondent to give the ‘right’ answer - what Bryman (2001, p.130) described as “social desirability

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<sup>31</sup> The subject force is responsible for the policing of a combined geographical area of 2,200 square miles (5,700 km<sup>2</sup>)

bias". This particular feature, when considered alongside the capacity to access a large respondent sample in a relatively short timeframe, made a web-based survey an obvious candidate to address this particular research question. Moreover given that this quantitative method was being used in parallel to a qualitative research strand any concerns that it "objectifies the respondent as data whilst their subjective experiences and personal meaning become lost in the process" (Davies et al., 2010, p.3) were mitigated. Furthermore the sometimes levelled complaint that web-based surveys are inherently biased toward internet users (University of Wisconsin-Madison, 2010) was not considered to be significant. The internet is integral to the working practices of both police and professional pesticide users and, simply by virtue of their having accessed the survey, the third sample group must also have been internet-able. Given that this was a comparative exercise, and no subject group was disadvantaged by the use of a web-based survey, this potential flaw was not considered to be relevant.

Turning to consider the development of survey questions this was influenced by one overarching consideration; that the questions would be included in a wider rural crime survey facilitated by the subject police force<sup>32</sup>. This rather constrained the number of specific counterfeit pesticide specific questions that could be included. However, whilst this was not an ideal situation the advantages this collaboration brought far outweighed the cost of having to be circumspect as to what the survey might achieve. This constraint also meant that there was no capacity in the survey to accommodate 'flabby' questions and so guidance on producing an effective web-based

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<sup>32</sup> This wider survey was designed and managed by the author in support of the subject police force's rural crime initiative as a quid pro quo for cooperation with the study. Whilst there were a number of 'shared' questions those that related to counterfeit pesticides were used exclusively for the purposes of this study.

survey was taken from Couper (2008) and on specific question design from Fowler & Cosenza (2008).

Prior to data collection a draft set of questions were field tested for reliability, the extent to which repeatedly measuring a single property produces the same result, and validity, the extent to which they measure the property they are supposed to measure. This testing was conducted in an entirely separate police force area and one that was geographically remote from the subject force (approximately 130 miles/208 km between their respective headquarters). This minimised the risk of the field test influencing live data gathering by virtue of prior knowledge. Twelve paper-copy surveys were completed by a mix of police officers (n=5), pesticide users (n=3) and members of the public with no vested interest in either (n=4). In addition participants were asked to complete a feedback form, a copy of which is shown at Appendix 2. The data produced by this trial survey was also transposed to a dummy table to ensure that analysis would not be problematic. As a result of this testing a number of changes were made before the question set was finalised, notably:

- The order of questions was changed (the pesticide element being included later in the survey to minimise the possibility of respondents becoming overly focused on a specific crime at the risk of influencing the wider survey);
- Several words and phrases were modified to remove jargon;
- The response dimensions of a number of questions was changed to allow for more meaningful analysis.

The data produced in the field trial was not incorporated in the final survey results, this being confined strictly to that generated in the live data gathering phase. The final set of survey questions, including that used to separate the respondent groups at the point of analysis, are reproduced in Appendix 3 wherein those questions

that were used for the purpose of this study are indicated by way of bold print<sup>33</sup>. Once finalised the survey was transposed to a web-based survey format and functionality was tested by the author before it was used in a live situation<sup>34</sup>.

It has already been noted that this was a collaborative survey, and the consequential limitations have been acknowledged. However, this collaboration brought considerable advantage, not least in the access it gave to the most problematic sample groups and in the legitimacy and prestige that the involvement and endorsement of a police force carried. As Hagan (2002, p.160) recognised “the greater the public visibility and reputation of the organization sponsoring or conducting the survey the greater the potential for response”. The overall interest in and subject engagement with the survey was also enhanced by it being included as part of an ongoing campaign on the part of the subject force to heighten awareness of rural crime issues. This campaign was the predominating factor in terms of the timing of the survey, however, in consultation with an experienced agronomist it was suggested that avoiding peak pesticide spraying periods would probably result in increased professional pesticide user participation. This timing criterion was therefore also incorporated into the data collection plan, the pesticide user subject group being the first to be surveyed prior to the peak spring spraying period.

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<sup>33</sup> Besides those questions used in this study a number of other questions in the survey make reference to counterfeit pesticides, particularly in the context of where farmers obtain crime prevention advice and where they believe an incidence of counterfeit pesticide should be reported. These questions were included in the survey with a view to the future development of an awareness campaign, advantage being taken of the opportunity to gather data.

<sup>34</sup> The web-based survey was conducted using SurveyMonkey, a well-known propriety online questionnaire tool.

This timing issue was indicative of the distinct nature of the three subject groups and the means by which they were accessed with the web-survey necessarily reflected this uniqueness:

- Police officers and police staff were contacted by way of an ‘all-user’ email and a briefing on the force intranet system with a hyperlink to the web-based survey;
- Professional pesticide users or those professionally engaged in the manufacture or distribution of pesticides were contacted by way of an email disseminated through the Thames Valley Rural Crime Partnership (TVRCP)<sup>35</sup> and with the assistance of the National Farmers Union (NFU)<sup>36</sup> who facilitated the same email being forwarded to members within the force area. Again the email contained a hyperlink to the web-based survey;
- Individuals who had no professional interest in pesticide manufacture, distribution or use and were not employed by an agency that enforces pesticide regulation or the law were contacted through a local newspaper campaign which promoted the force rural crime initiative and appealed for readers residing in a rural area to access the survey via the force public website<sup>37</sup>.

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<sup>35</sup> The TVRCP is an initiative designed to “bring together relevant individuals and organisations to provide coordination and strategic leadership in tackling rural crime issues across Oxfordshire, Berkshire and Buckinghamshire and, together, contribute to reducing rural crime and the fear of rural crime in Thames Valley” (Thames Valley Police, 2015c) .

<sup>36</sup> The NFU estimates that more than 70 per cent of full time farmers are members (National Farmers Union, 2015).

<sup>37</sup> The appeal was published by five local newspapers which between them covered a large proportion but not all of the force area. These newspapers were:

- Buckingham Today
- Bucks Free Press
- Oxfordshire Guardian
- Newbury Today
- Banbury Guardian

In all cases contact was prefaced with an explanation that the survey related to rural crime and policing and would be used for research purposes both by the force and a collaborating University. No specific mention was made of counterfeit pesticides in the briefing as it was considered that this might deter engagement on the part of those with no knowledge of the subject and therefore give an imbalanced result.

A target sample size was decided upon before the survey was put to the three groups with a view to a follow-up process of either email or further press appeal being instigated if this target was not achieved within two-weeks of the survey being launched to each group. This target was the product of a desire to gather sufficient data for a meaningful inferential statistical analysis to be undertaken. Meaningful was deemed to be 95% confidence that the resulting figure for police and police staff awareness of the counterfeit pesticide problem is accurate to within a confidence interval of 10%. The sample size necessary to achieve this was established using the standard formula<sup>38</sup>:

$$\text{Sample Size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 p(1-p)}{e^2 N}\right)}$$

*Population Size* = N

*Margin of error* = e (0.10 for 10% margin of error)

*z-score* = z (1.96 for 95% confidence)

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No indication was given that response was sought from those without links to the professional use of pesticides or to policing. Responses were therefore sorted at analysis and non-qualifying ones (those that did have a link to either of these two groups) were discarded.

<sup>38</sup> Whilst various formulae are in common use for calculating required survey sample size for consistency the one utilised in the study was that recommended by the online survey application through which the survey was conducted.

For the purpose of the calculation population size (N) for each subject group was taken to be:

- Police officers and police staff N≈7900 (Thames Valley Police, 2015b)<sup>39</sup>;
- Professional pesticide users or those professionally engaged in the manufacture or distribution of pesticides N≈3600 (Defra, 2014; NAAC, 2015)<sup>40</sup>;
- Individuals who had no professional interest in pesticide manufacture, distribution or use and were not employed by an agency that enforces pesticide regulation or the law N≈2.26 million (Thames Valley Police, 2015a)<sup>41</sup>.

To achieve meaningful inferential statistics the required sample size for each group was, in the order given above: 95, 94, and 97. These were adopted as the targets for each sample group. These targets were achieved within the allotted two-weeks and so there was no need for follow up activities.

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<sup>39</sup> It is acknowledged that not all of the police and police staff identified in the data provided by Thames Valley Police would be operational and of those that were not all would have contact with a rural community. Nevertheless the figure was used in in raw form because enquiries made with Thames valley Police did not produce a meaningful breakdown such that an operational/rural contact proportion could be established. If anything using this larger population figure overestimated the required sample size and could therefore be seen as erring on the side of caution.

<sup>40</sup> The given figure is composed of an extrapolation from Defra data for the structure of the agricultural industry of holdings within the counties and unitary bodies that collectively make up the Thames Valley Police area. This was combined with a figure for contactors who are based in the same area and undertake pesticide spraying on farms identified through the NAAC website. It was assumed that contractors were not also farmers on the basis that, given the size of the population, the potential extent of error would not make a statistically significant difference.

<sup>41</sup> No adjustment was made to remove those individuals contained within the other two subject groups because, given the very large size of the population, it made no statistical difference.

#### 4.1.5 Word cluster analysis

Given the relative newness of the problem it was perhaps to be expected that the literature review found a near absence of published research which addressed the counterfeit pesticide problem. However, what was surprising was that there was a similar lack of material relating to the wider police response to rural crime. In the context of the study this was a significant gap in the literature for in considering why there is a seeming lack of police engagement with the subject crime it was necessary to understand where the operational rural policing focus actually lay and whether this reflected the strategic and policy focus (research Q.6).

In-depth interviews and the qualitative FoIA requests, discussed in section 4.1.1 and 4.1.2, sought to identify the rural crime policies or strategies of police forces across the UK. However, in terms of understanding the extent of the police response to counterfeit pesticides these fell short of providing a complete picture because a lack of a specific strategy or policy is not necessarily indicative of a lack of 'on-the-ground' policing activity. However, operational engagement can be difficult to quantify particularly when, as is the case with rural crime, it is not a Home Office recognised recorded crime category (Home Office, 2015)<sup>42</sup>. This being the case the chosen solution was to look for a novel means of gathering data pertaining specifically to rural policing activity and one that overcame the constraints of police derived data not ordinarily being classified by any notion of 'the rural'<sup>43</sup>.

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<sup>42</sup> Home Office counting rules are designed to assure accurate and consistent crime recording between police forces. The current offence classification index can be found at <https://www.gov.uk/government/publications/counting-rules-for-recorded-crime>

<sup>43</sup> Police crime recording systems, for example the widely used Niche system, categorise crimes by type such as theft or fraud without necessarily further categorising it by location type (albeit the actual crime location is recorded). Any attempt to extract rural crime data would necessitate a significant amount of supplementary analysis by the police which, because of the costs



Whilst published research was essentially absent there was, by contrast, no shortage of media reporting on the police response to rural crime. Indeed the large volume of accessible material presented a logistical challenge in itself. Nonetheless, and despite the practical issues involved, this largely unstructured content represented a potential source of usable and useful data concerning the police response to crime in the rural setting. However, there was a clear challenge in finding a pragmatic means of extracting the main themes contained within such a large body of media derived material. One potential approach would have been to apply an appropriate method of discourse analysis, such as one of the critical approaches summarised by Blommaert and Bulcaen (2000) and described in practice by Wodak and Meyer (2001). However, what was readily apparent from the methodological descriptions provided by these subject experts is that these are analytical techniques designed to study the finer detail of complex social phenomena (Wodak & Meyer, 2001). Of course the extraction of such detail would not have disadvantaged the study, and the problem-orientated focus of such critical view of the data may well have furthered understanding of rural crime. Nonetheless the resources required to conduct any meaningful analysis of the large volume of available data using such methods could not be justified given that this review sought a comparatively rudimentary indication of the primary police rural crime focus. To that end an alternative review method was developed, and one that would give a simple but clear indication of the main themes contained within a large number of news media derived articles concerning the police and rural crime.

A word-frequency analysis is a relatively new approach to the analysis of text data, its outstanding feature being its capacity to exclude grammatical and non-frequent words and to present the remainder in such a way that the more frequently a

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incurred to meet the request, any associated Freedom of Information Act (FoIA) disclosure request would be very likely refused (Bourke et al., 2012, p.11).

word occurs in a sample then the more prominence it is given. From this word frequency a dendrogram, sometimes called a word cluster analysis, can be compiled which demonstrates the strength of association between the most commonly used words to more clearly show prominent content so that the reader might quickly perceive its relative significance. As Carroll and Roeloffs (1969) recognised at the very beginning of computer generated statistically based methods of word-frequency analysis such techniques can provide a more reliable way for researchers to identify and demonstrate key themes or trends than traditional manual indexing. They are a potentially powerful analytical tool particularly where there is a need to communicate the findings of mixed method research (Creswell, 2010) and, provided the limitations of such methods when compared to traditional content analysis are recognised (McNaught & Lam, 2010, p.630), they provide a readily accessible means of interpreting large quantities of text data. Used in this study it presented a means of analysing the pattern of content of a large sample of text data concerning the policing of rural crime to bring to the fore the key thematic focus of that sample.

This method of text data analysis was used to review the content of on-line media reporting of rural crime over the twelve month period May 01 2013 to April 30 2014. Given the rapid growth in both online news reporting, to the extent that the majority of news stories are replicated in digital format, and the proportion of the population now accessing news via digital platforms (Levy & Newman, 2014) constraining the sample to digital media was deemed an appropriate strategy. Moreover the use of online reporting as a data source readily lent itself to this form of analysis because the content is available in a digital form, a prerequisite for computer

based word-frequency analysis. Data was gathered by way of an online alert facility<sup>44</sup> using the search terms given in Table 4.6.

**Table 4.6:** Summary of the alert search criteria used to identify online articles relating to the policing of rural crime.

Primary search term:	Secondary search terms:
Rural	+ crime
	+ criminal*
	+ offence
	+ offend*

\*The wildcard symbol was used to capture all words that began with either 'criminal' or 'offend', for example criminals, criminality, offenders, offending.

The algorithm employed allowed for the combination of a route word (rural) with various other words to capture multiple variations on the rural crime theme. The results were then filtered to exclude all content that did not relate to the UK and was then further filtered to exclude comment and reporting that did not have a recognisable link to the police and the policing of rural crime. By collecting data over a full twelve month period the sample took into account the cyclical nature of some rural offending such as hare-coursing and crop theft. The relevant content of these articles, that is to say the article itself rather than any extraneous web page content, was then captured into a

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<sup>44</sup> There are a number of online alert systems available including Google Alerts, which was the one used in the study. The application monitors the Web content as it is generated for the appearance of specified words and phrases and emails the results to a nominated account every time it encounters a new result.

usable format using NCapture<sup>45</sup>. Prior to the production of the cluster analysis a number of stop-words were then applied, these in addition to those included by default by the algorithm to minimise data clutter. These additional stop-words were those common to the majority of the articles by virtue of the original online alert search terms and which would inevitably dominate the cluster. These stop-words are given at Table 4.7.

**Table 4.7:** Non-default stop-words used in the word-frequency analysis

<b>Primary Stop-Word</b>	<b>Variants</b>
Crime	Crimes, Criminal, Criminals, Criminally
Rural	Rurally
Offence	Offending, Offender
Police	Policing
Officer	Officers

The default stop-word setting in the analysis software used included various conjunctions and pronouns and all words of less than four letters to give a more manageable and meaningful sample. In most instances these words would be regarded as ‘clutter’ in the results. However, an expanded search to include shorter words was undertaken and the resulting data reviewed to ensure that no words of significance were inadvertently excluded. The filtered data was then analysed using Jaccard’s coefficient. The use of this similarity metric as means of comparing the diversity of sample sets when considering keyword similarity has been well

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<sup>45</sup> NCapture is a web browser extension designed to quickly and easily capture content like web pages, online PDFs and social media for analysis in NVivo 10, the Qualitative Data Analysis system used throughout this study.

documented by Niwattanakul et al. (2013) and is defined as the size of the intersection divided by the size of the union of the sample sets expressed as:

$$J = \frac{|A \cap B|}{|A \cup B|}.$$

The outcome of this analysis are given as a tabular summary of word frequency, a word frequency cluster analysis, and an accompanying narrative synopsis of the results in the results chapter of the thesis.

## **4.2 Data analysis methods**

### **4.2.1 Method of analysis for the qualitative data**

Unlike quantitative data the results of qualitative research are not given to analysis by mathematical techniques. Whilst the qualitative data gathered in the course of this study was the product of systematic methods the unrefined result of open-ended questioning remained essentially unstructured; that is to say it was not grouped according to any pre-defined categories. Data derived from in-depth interviews, qualitative Freedom of Information Act requests, and the oral history interview all fell within this category of data<sup>46</sup>. To bring meaning to such data required it to be exposed to a process of inductive reasoning, that is to say the process of deriving general principles from facts or instances observed in the data. In the same way that the study has thus far drawn on the systematic procedures inherent to a grounded approach to research the method used to analyse the qualitative data drew inspiration from the

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<sup>46</sup> For the purpose of managing the large quantity of material gathered in the course of carrying out a review of the literature this was also treated as qualitative data and exposed to the process described.

same approach, and specifically the analytical technique with which the theory is most closely associated; the constant comparative method.

The constant comparative method of data analysis owes its origins to the milestone work of Glaser and Strauss (1967), the founders of the grounded approach to research. The method requires that the data be fragmented into discrete units which are then compared and coded to allow the researcher to develop concepts that seek to explain the social processes under investigation. This method of data analysis is often illustrated using the workflow described by Strauss & Corbin (1988)<sup>47</sup>, wherein the process is characterised by three major stages:

- i. Open coding, where the data is broken down into small discrete units and each unit is given a descriptor;
- ii. Axial coding, which involves assembling the coded units into categories which may reflect, for example, causal factors or other phenomena;
- iii. Selective coding, when themes that express the content of each of the categories are developed.

These stages are not necessarily sequential. A degree of overlap is likely if not inevitable and increasingly so as additional data is gathered and the process is repeated to inform the next iteration of data collection. As the available data grows, and new categories emerge, concepts are regrouped thus further refining their meaning,

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<sup>47</sup> Constant comparative analysis has been variously modified since its inception and some examples considered in the course of developing an appropriate method of data analysis for this study bore only passing resemblance to the original. This is not meant as a criticism, rather it might be seen as evidence of the strength of this technique in that researchers have successfully adapted the process to fit the particular circumstances of their own work. For this reason it was deemed entirely appropriate to go 'back to basics' and to draw on the work of Strauss and Corbin (1998), who provided an early description of the fundamental principles of the method, as a guiding source as well as referring to later writers on the method.

identifying their properties, and exploring their relationship to one another. This continues until they can be integrated into a coherent model. It is in progressing through this process that an explanation for the social processes being studied should ultimately emerge (Taylor & Bogdan, 1984). The method of qualitative data analysis used in this study was rooted in this process of grouping and then regrouping concepts as a response to the addition of newly acquired data.

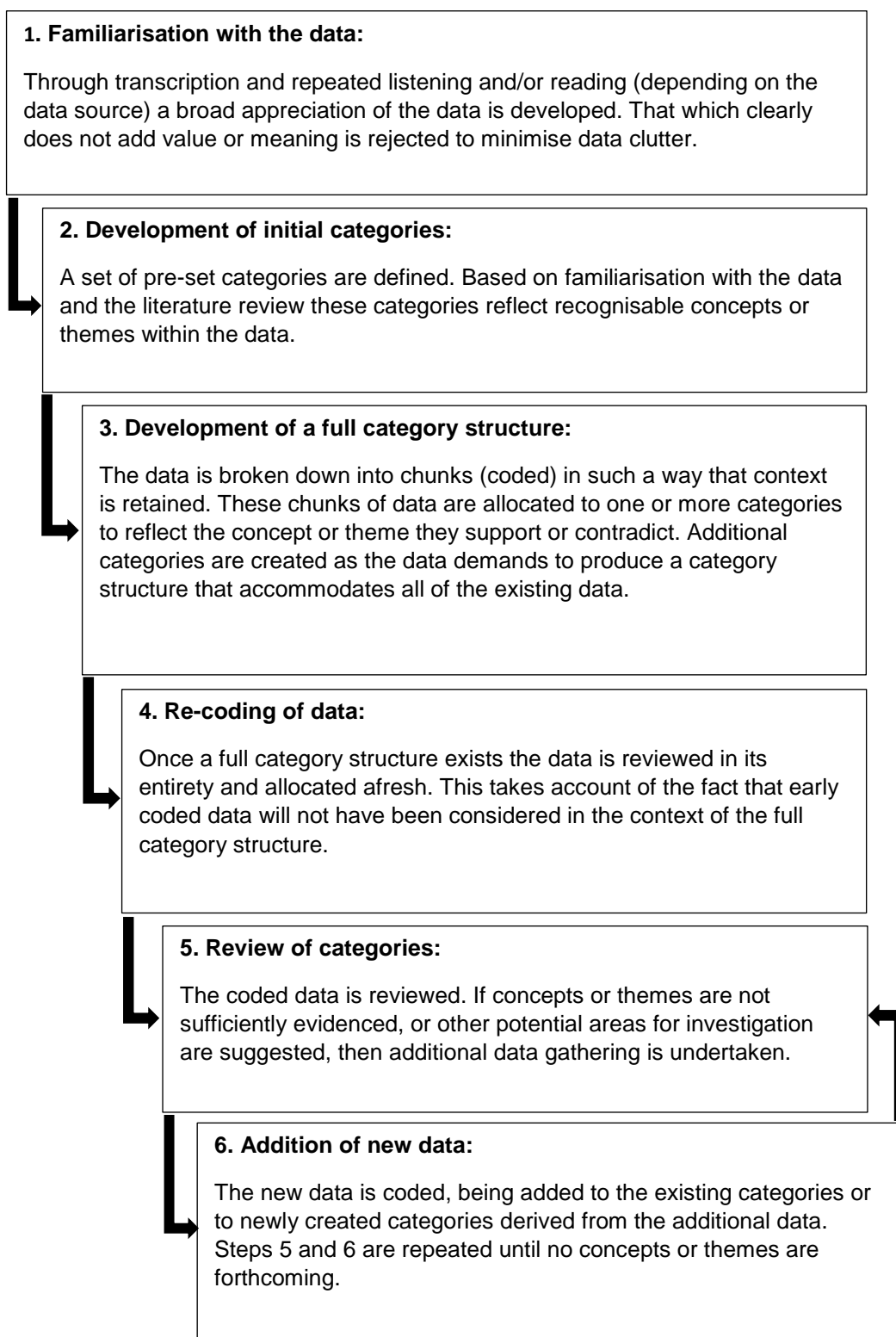
Contemporary researchers are fortunate to have qualitative data analysis software (QDAS) available to them to ease the task of data coding, and proprietary QDAS was used throughout this study as a means of both managing data and developing themes<sup>48</sup>. That is not to suggest that the task of interpretation was surrendered to the logic of a computer; the software was utilised as a tool for efficiency, to “support analysis but leave the analyst firmly in charge” (Fielding & Lee, 1998, p.167). QDAS was therefore used to hold coded data in an accessible and modifiable form which could then be readily recoded in response to the addition of new data and as fresh themes emerged, the ‘constant comparative’ element of a grounded approach. A summary of the overall analysis method is given at Figure 4.5.

#### **4.2.2 Method of analysis for the quantitative data**

Quantitative data was generated from three distinct sources, the first of which was the web-based, closed-question survey described at section 4.1.4 of the thesis. The population characteristic to be described by this survey was the relative awareness of the counterfeit pesticide problem amongst police officers and police staff working within a force with a significant farming community. The choice of sample police force,

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<sup>48</sup> The QDAS software used in the study was NVivo v.10 and guidance as to its use was primarily taken from the book *Qualitative Data Analysis with NVivo* (Bazeley & Jackson, 2013).



**Figure 4.5:** Constant comparison cycle of analysis for qualitative data.



and the meaning of 'significant farming community' in the context of the use of pesticides, is also discussed in section 4.1.4 of the thesis.

For the purpose of comparison observations were obtained from three subject groups;

- Police officers and staff working for a police force with a significant farming community within its force area (n=289);
- Professional pesticide users or those professionally engaged in the manufacture or distribution of pesticides (n=114);
- A control group of individuals who had no professional interest in pesticide manufacture, distribution or use and were not employed by an agency that enforces pesticide regulation or the law (n=647).

Each subject group was separately compared to the two other groups, the null hypothesis in each case being that the two samples were identically distributed this being expressed as:

$$H_0: u_1 = u_2$$

The alternative hypothesis was therefore that the two samples were not identically distributed this being expressed as:

$$H_0: u_1 <> u_2$$

The choice of statistical test to be applied was made having established that the data was not normally distributed. This was achieved through the application of the Shapiro-Wilk test<sup>49</sup>, using the null hypothesis principle and the test statistic:

$$W = \frac{(\sum_{i=1}^n a_i x_{(i)})^2}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

This pointed toward the use of a nonparametric statistical analysis of the data and, given that this was ordinal data derived from Likert scale questions answered by independent groups (rather than paired samples), a choice between the Mann-Whitney U-test and the Kruskal-Wallis H test (Siegel & Castellan, 1988).

Kruskal-Wallis extends the Mann-Whitney U-test to more than two groups and would have allowed for a 'one-step' test of the three sample groups. However, it is not without its drawbacks, principally that the test does not identify where stochastic dominance occurs (Field, 2013, p.238). As a consequence, and assuming the test indicated that the three sample groups were not the same, it would not in itself have demonstrated where this 'difference' lay. It would only indicate that at least two groups are different and, to be of practical use to the study, a further ad hoc test would be required to overcome this shortcoming.

In the context of this study this seemed an unnecessary encumbrance when the Mann-Whitney U-test provides an option that was equally robust, Siegel and Castellan

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<sup>49</sup> The Shapiro-Wilk test was deemed an appropriate test of normality given the favourable findings of Razali and Wah (2011) with regards to the power of the test compared to commonly used alternatives.

(1988) describing it as one of the most powerful nonparametric tests, and would not require further analysis<sup>50</sup>. Field (2013, p.221) gives the test statistic  $U$  as:

$$U = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

In order to determine if the mean of two groups are different from each other Mann-Whitney requires that four conditions be met (Laerd Statistics, 2015):

- i. The independent variable must be at least ordinally scaled;
- ii. The independent variable has only two levels;
- iii. A between-subjects design is used;
- iv. The subjects are not matched across conditions.

All conditions were met and so the Mann-Whitney U-test was used to compare the primary subject group (A) to the other two populations. Analysis was undertaken using a proprietary statistical analysis software with a social science leaning (being strong in nonparametric analysis) and with the capacity to generate the descriptive statistics, tabulated reports, and charts required for illustrating the results<sup>51</sup>.

The second source of quantitative data was a series of Freedom of Information Act (FOIA) requests which are discussed in section 4.1.2 of the thesis. The intent behind this strand of the research was to produce longitudinal data which would demonstrate the pattern of occurrence of the counterfeit pesticide problem over time as observed by various enforcement bodies. However, with one notable exception all subject requests produced a nil return. Moreover the single positive data return was

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<sup>50</sup> The Wilcoxon rank-sum test provided an additional alternative to the Mann-Whitney test. Both tests being equivalent (Field, 2013) Mann-Whitney was chosen simply because of the favour it is afforded by the renowned statistician Sidney Siegel (Siegel & Castellan, 1988).

<sup>51</sup> The statistical analysis software used in the study was IBM Statistical Package for the Social Sciences (SPSS) and guidance as to its use was primarily taken from Field (2013).

accompanied by a narrative which indicated that the results should not be afforded statistical significance. Nonetheless in terms of the overall study these results were notable in themselves and supported an important part of the discussion. That said, and for the reasons given, the results of this strand were not subjected to statistical analysis but are presented in the results by way of a narrative. The final quantitative strand of the study consisted of a word cluster analysis of rural crime specific online newspaper articles published over a twelve month period. The analysis of this data is discussed along with the method in section 4.1.5 of the thesis.

## 5.0 Results of the research

The second step of the convergent parallel mixed method research design involved the data from each strand of research being independently analysed before being merged. To that end the results of the research are now presented such that they reflect the modular nature of the data gathering phase of the study. Beginning with the qualitative strand the results of both in-depth interviews, which explored the nature of the UK counterfeit pesticide problem (research Q.1) and the setting of rural policing strategy and policy within the subject police force (research Q.5), and qualitative FoIA requests, designed to determine the extent to which national police rural crime policy and strategy accommodates this crime (research Q.4), will be summarised. The qualitative research results conclude with the oral history interview, a narrative summary of an incident involving counterfeit pesticides which occurred on a UK farm.

This is followed by an analysis of the quantitative data derived from an online survey, which explored the comparative levels of awareness of this crime amongst police officers and staff (research Q.7), and a word cluster analysis of on-line reporting of the policing of rural crime which examined where, in the operational setting, the police rural crime focus is truly located (research Q.6). Quantitative FoIA request, designed to produce quantitative data indicative of a counterfeit pesticide occurrence trends from enforcement agency data (research Q.2) and determine where this problem is being dealt with if not by the police (research Q.8), produced a largely negative return. However, these returns are of significance in themselves particularly if they are considered in the context of the narrative response of one particular subject organisation.

## **5.1 Analysis of the qualitative data**

Analysis of qualitative data was undertaken using the method described in section 4.2.1 of this thesis. Having concluded the coding process the final data categories (Nodes), the key subject areas that emerged from the in-depth interviews (including the oral-history interview) and the qualitative FOIA requests, were as given in Table 5.1. For the purpose of recognising these categories as they appear in the narrative summary of the results that follows they are shown in bold in the text. In addition, in both Table 5.1 and the narrative summary, the number of sources (S) that contributed to each category and the total number of references (R) to the node subject made by those sources is also indicated. The intention here is to provide an indication of how often each category was the subject of discussion within stakeholder interviews or occurred within FoIA data. This should not necessarily be seen as an indication of significance because some of the most important findings of this strand of research were derived from points raised by one or two individuals or organisations.

### **5.1.1 In-depth interviews**

Intended to describe the nature of the counterfeit pesticide problem as it manifests itself in the UK setting twenty two stakeholder views, drawn from the sixteen organisations shown in Figure 4.2, and a farmer victim of a counterfeit pesticide incident were documented. For reference individual areas of knowledge and expertise are given in Table 5.2. To ensure anonymity neither individual job titles nor employers are given and all participants are all referred to as 'he' in the narrative. No gender bias is intended. Where a participant's contribution is discussed they are referred to by their unique study reference number, for example #01. Direct quotes are only used where it is possible to do so without compromising the participant's personal anonymity.

**Table 5.1:** NVivo data analysis nodes (categories) and the number of Sources (S) and References (R) coded to each node.

Primary Node	Secondary Node	Source (S)	References (R)
Source of counterfeit products		9	18
UK Modus Operandi		12	52
	Organised crime link	7	15
	Supply chain structure	8	29
	Consumer motivation	10	21
	Counterfeit quality	3	7
	Consumer risk factors	7	17
	Industry consequences	9	20
	Public consequences	3	13
	Deceptive counterfeit risk	2	3
Defence of parallel imports		2	10
Occurrence pattern		9	16
	Able to recognise occurrence?	7	17
	Response strategies	10	33
Likely incidence		8	12
	Significant under estimate	1	1
Collection of occurrence data		5	12
	Integrity of occurrence data	4	6
Significance of amenity market		4	10
	Characteristics of amenity market	4	12
	Product source	4	6
Industry knowledge and intelligence		4	7
	Constrained knowledge sharing	6	8
Enforcement agency engagement		7	27
	Definition of rural crime/policy	13	14
	Police rural crime priorities	4	10
	Refer to another agency	1	1
	Need for greater awareness	2	4
Rural crime/OCG link		7	13
	Significance of hare coursing	5	5

**Table 5.2** Areas of knowledge and expertise of the in-depth interview participants.

<b>Participant</b>	<b>Area of expertise</b>
#01	Pesticide manufacturer anti-counterfeiting strategy
#02	Pesticide manufacturer representation
#03	Farmer user representation
#04	Agricultural merchant/distributor representation
#05	Farmer buying groups
#06	Pesticide manufacturer Intellectual Property (IP) protection
#07	National agrochemical distribution
#08	Pesticide regulation enforcement practice
#09	EU pesticide parallel trading
#10	Agronomist and Eastern European farm management
#11	European pesticide manufacturer representation
#12	Independent counterfeiting intelligence services
#13	European pesticide manufacturer brand protection
#14	Consumer protection (local)
#15	Standard setting and auditing for pesticide use
#16	Amenity pesticide use
#17	Consumer protection activities (national)
#18	Farmer counterfeit pesticide victim
#19	Police strategy design
#20	Police policy setting
#21	Standard setting and auditing for pesticide use
#22	Standard setting and auditing for pesticide use



Initially looking to gain an overall impression of the problem as it manifests itself in the UK setting, and specifically the typical **modus operandi** (S=12, R=52) it would be fair to say that stakeholder opinion broadly reflected the industry narrative observed in the literature review. Overwhelmingly opinion was that the problem is intrinsically associated with the trade in parallel products. That is not to say that the legitimate parallel trade in pesticides was universally condemned for robust support for system of trading that is designed to facilitate fair trade across the European Union was observed. As participant #03 pointed out parallel trading provisions provide balance to what he described as “a monopolised situation”. Nonetheless there was a majority view amongst both mainstream manufacturers and representative bodies that the current parallel trading rules as they relate to pesticides, and contained within the Plant Protection Products Regulations 2011, are regularly being abused and that it is this abuse that underpins the UK counterfeit pesticide problem.

Participant #08 described what the regulations require of a product before it can be imported under parallel trading rules; “it has to be exactly the same product, it cannot be similar, it cannot be basically the same, it has to be the same product which has been approved”. This contributor also pointed out that although repackaging and relabelling of the product is allowed it must comply with the conditions of the permit. It was generally agreed by participants that, on the face of it, both the packaging and labelling requirements were being met by those abusing the parallel trade system, but this was largely irrelevant because the product contained therein did not meet the ‘exactly the same product’ criteria<sup>52</sup>.

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<sup>52</sup> A summary of how legitimate parallel trading operates, and the means by which the trading rules are abused to facilitate the import of counterfeit pesticides - dubbed the ‘Hornet’ model by the author, can be found at Appendix 5. The details of this illicit method of trading were derived

As participant #11, an expert with an overview of the complex workings of the market, described a “near perfect clone” is brought into the European market by illicit traders, packaged in accordance with the associated parallel trading permit, and is then introduced into the legal market under the guise of a legitimate product. The extent to which manufacturers believe this practice dominates the illicit market was summed up by participant #06 who said “from our experience in the UK it’s almost exclusively illegal parallel trade”. Whilst some pointed out that the **deceptive counterfeit risk** (S=2, R=3) did exist, that is to say products designed to look like the original (including packaging), and such items may occasionally occur in the UK market for generic products<sup>53</sup>, this was seen as very much a lesser problem, the overwhelming focus being on parallel traded products.

When challenged to evidence this indictment of the trade in parallel product pesticides participant #01 drew on his experience of dubious product seized over a number of years;

“We must have had four or five cases every year for several years now with a range of products and when we test them in our laboratories they don't meet our spec [specification]. They're to a spec, sometimes a little bit low on active

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from the results of the study and is exemplified in practice in the industry case study given at Appendix 4 which draws upon the experience of participant #08.

<sup>53</sup> A generic product is one for which the patent has expired and other companies, those that did not hold the original patent, are at liberty to produce their own version. Whilst these would not necessarily be described as identical to the original they will contain the same active ingredient. Such products are susceptible to the activities of the counterfeiter in the same way that the original patented product would have been.

[ingredient], sometimes different surfactant systems<sup>54</sup>, that kind of thing. So, there are genuine differences according to the parallel trade rules”.

He continued “for the most part the ones we've had look okay in the bottle, but when you put it through the lab it's not correct”. However, whilst such examples were not uncommon many participants acknowledged that securing evidence of illicit practice is problematic, not least because the quality of such products when compared to the genuine item has risen over recent years. As was recognised in the literature review there is a general pattern of improving **counterfeit quality** (S=3, R=7) across all sectors, including pesticides, a factor acknowledged by several participants. Whilst participant #01 believed that “the criminals are learning to do it much better than they ever did before” participant #11 went further, suggesting that the counterfeit product appearing in the UK is as good a copy as would be found anywhere, indeed “near perfect”. As a consequence recognising a counterfeit is inherently difficult without a full laboratory analysis and, as participant #04 pointed out;

“Short of actually dip sticking it or doing a test and sending it off for analysis which involves opening random cans to make sure you are not being duped by a sample which obviously then costs money. You can't do it for every batch of product that you've sold”.

As has already been noted several participants pointed out the significance of current parallel trading rules which allow for the repackaging of product before it enters the supply chain and is sold into the farm market. As participant #02 described “once

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<sup>54</sup> A surfactant is an ingredient within the pesticide which lowers the surface tension and facilitates an even distribution of the product when it is mixed with water in a sprayer tank.

you have a permit you can buy a load of containers and pack product... label it, and say this is my parallel product". There was then almost universal recognition of the incongruity of trying to identify a counterfeit product for testing where, by virtue of rules under which it is traded, it need not physically resemble the product it purports to be. It is then, to all intents and purposes, a deceptive counterfeit that exhibits the qualities of a non-deceptive product by deceiving without the need for an original manufacture brand or trademark. Indeed the product need not bear any resemblance to the product it purports to be. Importantly, and as participant #05 pointed out, the enforcement body responsible for product testing (the Chemicals Regulation Directorate, CRD, part of the Health and Safety Executive) are "rushed off their feet trying to do other things" and as a consequence there is no enforcement and therefore no proactive means of recognising these uniquely well-hidden counterfeits.

Whilst this lack of engagement on the part of the CRD might be as much a matter of perception as it is fact it does not negate a widespread participant belief that, regardless of the extent to which they try to tackle the problem, any CRD enforcement activity is quite easily sidestepped. It was certainly the view of participant #09 who, based on first-hand experience of the machinations of the parallel trade in pesticides, believed that those intent on illicit activity could easily avoid being caught. By applying for authorities for multiple *Ministerially Approved Pesticide Product* (MAPP) numbers<sup>55</sup>, and switching between them if suspicion was aroused about the provenance of one of their products, the illicit trader could stay one step ahead of the inspectorate. As he

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<sup>55</sup> A Ministerially Approved Pesticide Product (MAPP) number is the product registration number allocated by the Chemicals Regulation Directorate (CRD) upon issue of the first commercial level of authorisation for a product. The assigned number remains with the product provided no major change is made to its identity or formulation. Parallel trade permit applications are based on the MAPP number of a product rather than its commercial name, which may vary from country to country or over time.

explained “as soon as you get caught one MAPP number shuts down and you just move to the next”. That is, of course, assuming that the inspectorate actually finds any evidence of illegality because, as the same participant pointed out, “what they ask for is sample, and that sort of thing is easily sourced. Just go and buy a case in France”. Moreover he was of the opinion that even if those flouting the regulations are caught the penalties imposed are scarcely a disincentive;

“if you have got a parallel registration and you put in generic material and CRD find it they will make you withdraw that product and take it off the market. And at the moment that is the main punishment that there is”.

It may have been a somewhat tongue in cheek comment but he went as far as to suggest that “if I was entering the market now I would be illegal because there is no penalty”. It is a problem that plagues manufacturer attempts to protect their intellectual property (IP) rights through legal action, well described by #06 who was of the opinion that going to court could actually be detrimental to their position;

“When you go to court with what you think is a very strong case and the punishment meted out is trivial the impact is actually negative because then other people will say ‘there's an opportunity for me here, I might get caught, but I've got a business model that's profitable, I'm not going receive any sort of punishment that's going to result in me going to jail or having, you know, my profits wiped out’. So it's actually saying to criminals, you know what? Come and join the party because there's nothing that's going damage you”.

It is because the trading of counterfeit pesticides carries such a low risk of being caught, or if caught that the consequences are not a disincentive to continue, that participant #08 suggested it now has a well-established **organised crime link** (S=7, R=15). Participant #08 further described the extent, complexity, and capacity to evade prosecution of OCGs involved in the trade;

“Certainly this is organised crime, these are very clever people. They have a business model which if you look at appears to be everything you would expect it to be... genuine, above board. You scratch the surface you don’t find anything too much. You may find the odd irregularity but anybody looking at this would have no immediate grounds to suspect criminal activity taking place. It is only when you start to look much deeper, start doing market testing, start looking at the European network, how they have organised themselves, who is invoicing for what. This is a very, very clever business model that has been established. They pay custom duty, they pay VAT. They don’t pay the right custom duty and they don’t pay the right amount of VAT, but to all intents and purposes it looks genuine... it doesn’t attract attention”.

As was recognised in the literature review it is this low risk of prosecution, combined with the high profit margins afforded by the “mark-up of ten to 20 times cost” described by participant #08 that makes it such an attractive proposition to OCGs. There are, to quote participant #09, “huge, huge amounts of money to be made” describing the market as being like “Santa Clause come... it’s a gift to them”, their cash rich position giving OCGs the ability to “lock up CRD” through legal process if ever they suspect illegality. Participant #08 described a trade dominated by a relatively small

number of what are ostensibly legitimate companies who regularly trade in the rural setting. The activities of these companies might reasonably be described as organised criminality, spanning the interface between legitimate and illegitimate trade often stepping with ease between the two when circumstances favoured doing so. In the course of the interview this participant facilitated access to case data which illustrated several elements of the counterfeit pesticide trade including this interface<sup>56</sup>. This organised crime link was also well recognised across mainstream manufacturers all of whom had a similar view of how this had evolved of late, typified by participant #01 when expressing the view that “we're dealing with a much more professional approach from the criminals, which suggests, as you know, we think within the industry that organised crime is behind this”.

Manufacturers also collectively recognised the primary **source of counterfeit products** (S=9, R=18) being traded as China. The multinational nature of mainstream pesticide manufacture being what it is manufacturers saw themselves as taking a double hit. As participant #01 pointed out when talking about illegal product “we have a mass of problems in China. Not just that they make it and export it but they sell it locally as well”. The manufacturer perception of China as the root of this transnational problem is supported by enforcement agency experience. Participant #08 said that, based on his knowledge of illegal product identified in bonded warehousing, over 95% of counterfeit pesticides that entered the UK originated in China. Participant #08 went on suggest that this should come as no surprise given the ease with which an individual or

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<sup>56</sup> The data provided by participant #08 was used as the basis of an enforcement case study which illustrates the process through which one particular illegal product being sold into the UK market was identified and the offending company prosecuted. The case study is given at Appendix 4. Evidence of other similar cases were provided by participant #08 but are not discussed further in the thesis because they are potentially of evidential value in any future related prosecution.

company could buy these products from China at a fraction of the price of the branded product within the EC.

The relative ease of access to the Chinese market was a common theme in the interviews, a number of participants describing the open trade in active ingredients that goes on at various specialist trade fairs across Europe. Indeed evidence was found of blatant and scarcely concealed illegal practice, participant #09 recounting from personal experience;

“There is a conference, it was in Brighton or Glasgow and it is now in Amsterdam, and you meet these Chinese people who know the registration system. And they say ‘well look you go and get two pallets of the real stuff and we’ll bolster it out with two pallets of ours at 60% margin as opposed to 10%’. So, if you were greedy...” [participant stopped talking]

Even for those not attending such events access to sources of pesticide manufactured to specification seemed relatively simple. As participant #09 described;

“We get emails, probably 4 a week from China and India, saying we notice you have got these [parallel trade] registrations. We could supply you with product and you could make 80% more money...”<sup>57</sup>

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<sup>57</sup> It is interesting to note that in the course of the research the author had personal experience of Chinese manufacturers offering to supply pesticides to personal specification. Sporadically throughout the study such unsolicited emails arrived in the author’s University email inbox, presumably as a consequence of the senders having identified an interest in the subject.



In terms of the quality of these products, which is discussed elsewhere, this may well be closely linked to a problem experienced by mainstream manufacturers who have production capacity in China. As participant #01 described, in production plants outside of their home countries “there’s product leaking out of the back door or people are leaving with the technology in their minds”.

What was probably less well understood was how, once supply had been secured, these products find their way from source into the UK marketplace. Nonetheless there was general consensus that the majority of illegal consignments probably enter mainland Europe or the UK through the major ports, participant #08 stating that;

“There are certain ports across Europe which are targeted [by counterfeit importers]. Felixstowe is one of them. Hamburg, Antwerp, Rotterdam are the others but Felixstowe is certainly a port which is targeted. Has been Southampton occasionally but Felixstowe is the main port in the UK...there are known companies within the UK who use Felixstowe”.

Participant #12 described how these products are generally brought in to the EU as constituent parts (chemicals in bulk, empty bottles, and labels), often in separate consignments, thus avoiding meeting the strict definition of a counterfeit in the eyes of customs staff. These constituent parts are then brought together once inside the EU. Participant #08 added to this explaining how chemical products also avoid Border

Agency suspicion because they are described as being destined for re-export out of the EU, a relatively common practice value having been added to the product because it carries the credence of being a product of UK origin. This practice is not illegal in itself, however, there is evidence that a significant proportion of these products do not leave the UK rather they find their way into the parallel trade market<sup>58</sup>. This practice also highlighted a separate issue, and whilst not necessarily of direct relevance to this study certainly one that is pertinent to the overall understanding of the risk. These products are often wrongly described on shipping manifests, again to avoid detection at the point of entry into the EU. This poses a severe risk in container shipping, particularly if the flash-point of the actual product is lower than that of the declared product. As participant #12 explained flash-point information often determines the positioning of a container when loaded onto a ship, inappropriate positioning posing a serious fire hazard. A number of on-board fires have been attributed to such misdeclaration of the contents of shipping containers.

Whilst there was general agreement that the direct port route for illegal product predominates it was also suggested that there may be a growing overland route for the entry of illegal product into the EU. As participant #10 explained his experience was that farming in Russia and the Ukraine is characterised by fraudulent practice. Patently this makes the periphery of Europe a prime target for the OCGs involved in the trade in illegal pesticides and #10 described how an illegal product had been substituted for the original at some point in the supply chain before it reached a farm he managed in the Ukraine. It was an experience that mainstream manufacturers would identify with for several described how porous borders makes the Eastern European land-borders an

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<sup>58</sup> This practice underpins the 'Hornet Model' of counterfeit pesticide import practice which the author of this thesis designed to illustrate the practice in presentations and articles and which is described in Appendix 5.

important secondary point of entry for illegal pesticides. Once in to the European Union, as participant #06 described, “it has the ability to flow between countries”.

This secondary route of entry dovetailed neatly with the typical **occurrence pattern** (S=9, R=16) across Europe observed by participants. There was a consensus across the sample that the counterfeit pesticide problem is greatest at the eastern periphery gradually becoming less prevalent the further one moves west across Europe toward the UK and Scandinavia. As participant #02 described “It will vary from country to country... the further East you go the higher proportion of the market is illegal product”. Interestingly the same participant, along with participant #05 who had practical experience of trading with European companies, believed that there was also a greater prevalence of what might be described as classic deceptive counterfeits, that is to say those designed to look like a mainstream manufacturer’s product rather than a parallel traded product, the further toward the eastern periphery of Europe one looked.

Whilst the ‘further east the greater the problem’ maxim generally held good there was also evidence of particular hotspots occurring within this general pattern. At the time of the research there was particular concerns amongst manufacturers about the market in Germany and Poland, participant #06 saying that his company’s experience was that;

“Germany's the biggest one that we're aware of where there are several thousand parallel products registered... if you talk to them off the record they will say that they believe that 75-80% of the parallel products in the marketplace in Germany are illegal. Yeah, publicly they'll talk about 30%. There's similar comments or similar findings in Poland... much lower level, or much lower number of parallel products registered in Poland... but the authorities have

shown that the range of illegality for parallel products in Poland is again 35 or 40%”.

It was perhaps also significant that, as participant #06 had recognised, ‘hotspots’ were generally identified whenever local authorities made a concerted effort to address the counterfeit pesticide problem, possibly a case of the problem only being recognised and acknowledged when enforcement agencies chose to engage with it. This reinforced a point made by both industry and enforcement participants; that estimating the true extent of a counterfeiting problem is hugely problematic. As participant #06 said, with something of an air of desperation;

“You know you can’t go out and do market research of any meaningful level... there is some... what I say trustworthy data from farmers... but trying to do a meaningful survey of an illegal activity is almost impossible”.

This difficulty in obtaining anything approaching accurate occurrence data was a recurring theme when participants discussed the **likely incidence** (S8, R12) in the UK. Manufacturing participant #06 was prepared to put the proportion of their own market lost to illegal parallel products as somewhere between three and seven percent, reflecting the narrative that the UK problem was significantly less than mainland Europe, he also suggested that other manufacturers may be losing much more of their market to illegal product, perhaps as much as thirty percent. The truth of this ‘our problem’ and ‘their problem’ disparity was impossible to determine because, as participant #04 conceded “it is difficult to get hard facts”. Indeed when asked to consider the **integrity of occurrence data** (S=4, R=6) no participant was prepared to

call it anything other than an 'estimate'. The reality of gauging the proportion of the UK market lost to counterfeits was probably best summed up by participant #01 who simply recognised that "it's like measuring an iceberg. There's a bit on top you can see but there's a lot you probably can't".

That there was no standardised **method of collecting occurrence data** (S=5, R=12), and the consequential inability to speak with any confidence about the true magnitude of the problem, was clearly an issue of concern for a number of participants. As participant #01 conceded they were "struggling to put any meaningful data to this... it is guesswork", a view reflected by several participants who similarly recognised a lack of means of market monitoring to identify potential or emerging counterfeit issues. The weakness of the data relating to counterfeit pesticides was discussed in the literature review. However, what was not shown in the review, at least in the context of the UK pesticide market, but emerged out of the stakeholder interviews were the reasons why reliable counterfeiting data was so hard to come by.

Participants spoke of the three key stakeholder groups who are collectively responsible for pesticide manufacture, distribution and use, each having a different set of concerns which underpin their reluctance to report counterfeit incidence. Manufacturers clearly recognise the reputational damage that might result from any high profile counterfeiting incident. As participant #03 very honestly acknowledged "pesticides do not have the best reputation anyway... we don't want to make the situation any worse with regards to people's views on pesticides" and "it only takes one coming into the food chain to have a long lasting effect". These industry concerns were well summarised by participant #12 who believed that incident reporting is suppressed by all pesticide manufacturers because of the damage to a high value brand image that a counterfeit version being identified in the marketplace might cause.

This desire amongst manufacturers to protect brand reputation was noted in the literature review when observed in other industries. However, what was not apparent in the literature was a similarly heightened sense of self-preservation amongst product distributors and an awareness of the potential collective consequences of a serious counterfeit pesticide incident. Out of this stemmed a clear sense of cross-industry responsibility, as participant #04 described;

“I think there is also the issue that if a particular distributor, particularly a major distributor, has a batch of counterfeit product that the whole industry will be tarnished with a bad image... if that got into the media, particularly the national media, then that would be a big issue for the industry”.

This closely mirrored manufacturer concerns, and indeed this sense of collective responsibility extended further. As participant #04 described when an incident does occur;

“You find that if you do try and ask for evidence, and you say ‘I need you to give me some hard facts and information on volume batch numbers etcetera’ that you never get that information. It tends to disappear, and I think to some extent there is a concern that if a distributor grasses up another distributor then there may be some sort of war start. People do try and avoid that... they are not out to get each other”.

Amongst the study participants there was also a view that farmers who fell victim to a counterfeit product were, as participant #01 put it, “very reluctant to tell you where they’ve bought it because they’re sort of embarrassed”. This was slightly different, but not incompatible, with the view of participant #03 who felt any reticence was consequential more to concern about being drawn into legal cases rather than simple embarrassment. This alternative view was more closely akin to the experience of participant #18, a farmer victim of a counterfeit pesticide incident, whose decision not to report was largely out of fear of losing assurance status on crops and the possibility that his land may be barred from food production for some length of time rather than any sense of embarrassment<sup>59</sup>.

Whilst there were diverse views across the key stakeholders with regards as to the industry’s ability to **recognise occurrence or likely occurrence** it was generally deemed to be poor (S=7, R=17). Besides the problem caused by the increasing quality of counterfeit products, which has already been discussed, several additional reasons for this inability to spot incidence were proffered. The first of these was expressed by participant #01 who explained that “the regulatory schemes around our industry are focused on giving us approval to sell... market monitoring and market controls by regulatory authorities are not very significant”. In addition to a lack of regulatory ‘spot-checks’ or other proactive activity participant #06 suggested that the problem may be exacerbated when farmers are under economic pressure, circumstances “that may push some of them to tread the wrong side of the line to buy some of their inputs”. He added that this may go unrecognised because the industry lacks a system of horizon scanning to identify when economic trends are conducive to the counterfeiter in that farmers might be more inclined to seek out a ‘bargain’.

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<sup>59</sup> This reluctance on the part of a farmer victim to report an incident was a key feature of the oral history interview a narrative summary of which appears later this section of the thesis.

The potential for a high impact incident to occur as a consequence of a lack of market monitoring or economic horizon scanning was clearly a concern. This fear was compounded by several aggravating factors, not least that farmers are often sceptical of manufacturer derived warnings about counterfeit products, leaving them vulnerable because they fail to take reasonable precautions. As participant #07 succinctly put it when the industry approach farmers with cautionary advice they are often met with a blanket “you would say that wouldn’t you” response. Moreover the industry’s capacity to convince any farmer post the event that they have been sold and have used a counterfeit product is limited, crop growth being affected by so many other variables. As participant #05 put it “it is quite difficult to pick out a difference in the field unless it is something quite big”, not surprising given what has already been said about current counterfeit quality.

Assuming that there was a failure to recognise likely incidence and take pre-emptive action participants saw the likely consequences of counterfeit pesticides reaching the marketplace as numerous and, in extremis, having potentially life-threatening consequences. Beyond the reputational impact already discussed the **industry consequences** (S=9, R=20) most readily recognised were economic. Putting aside the obvious cost of a loss of business and sales revenue, and the additional costs associated with constantly having to advance physical product anti-counterfeiting technology and pursue legal recourse against those that abuse intellectual property rights which was described by participants #01 and #02, there was also the less obvious costs of having to ‘pick up the pieces’. This was an issue that caused tangible irritation and sometimes anger amongst some stakeholders. As participant #02 explained when a counterfeit pesticide incident was suspected on farm it was invariably the manufacturer of the product that the counterfeit pertained to be that the farmer or distributor contacted. Here the previously discussed potential reputational damage is



pertinent because manufacturers would most likely make good and take responsibility for storage and destruction of any remaining illicit product as a means of minimising any stigma by association. This was invariably an exercise that participant #12 described as carrying a “massive” cost.

Beyond the financial consequences their own businesses and to the wider distribution sector stakeholder participants were well attuned to **consumer risk factors** (S=7, R= 17) and to the potential **public consequences** (S=3, R=13) associated with counterfeit pesticides. The economic risks posed to farm enterprises were, as might be expected, perceived to be not dissimilar to the manufacturing and distribution industries, that is to say predominantly centred on reputational impact. Participant #03 recognised that should an incident be identified on farm then in all likelihood there would a withdrawal of any assurance status that might be held with an inevitable impact on the crop value<sup>60</sup> or at extreme, as participant #04 pointed out, the entire crop being destroyed. It was interesting that participant #18 confirmed this fear when talking about why he had not reported the counterfeit pesticide incident on his own farm. Most importantly the on-farm risk runs much deeper because spray operators may be exposed to products that participant #06 said “can contain impurities, harmful solvents, and a range of other ingredients that would not be there in a legitimate manufacturer’s product”. Interestingly this risk to operator health was deemed to be greater on those farms that participant #03 described as “occasional users” of pesticides, notably those

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<sup>60</sup> Farm assurance schemes are mainly voluntary arrangements that guarantee defined standards of food safety or animal welfare. Often involving an element of certification many buyers of farm produced products, such as supermarkets, will only deal with enterprises that have assured status. A loss of status would therefore greatly diminish the value of a crop. It would be fair to say that such schemes increasingly dominate farming practice in the UK, including pesticide use.

in the livestock sector, rather than those that are regular users of such pesticides who are likely to have more experience of safe operating practice.

Turning to consider the potential environmental consequences of counterfeit products the damage that can be caused on farms was graphically described by participant #01;

“We have videos of guys walking through dead maize and who knows what the hell’s gone onto the soil. And there’s a... I think he’s a French farmer... with a dead potato crop. You can see this on YouTube, dead potato crop, and he’s talking about the land being poisoned. So, it can get as bad as that”.

Whilst this particular example may not have been in the UK the principle held good particularly given that an example of environmental damage being caused in the UK was described by participant #18 and detailed in section 5.1.3 of the thesis. As participant #08, who has considerable experience of the dubious chemistry of counterfeit products, confirmed the constituent parts of such products are untested and their persistency in the soil is not known. Moreover he confirmed that the risk lies not just in the field because this unknown persistency opens up the possibility of the product finding its way into a watercourse and ultimately affecting, for example, fish stocks.

Once the residues of such products find their way beyond the field, be that through watercourse or crop, it creates a tangible risk to the general public. Again drawing on the expertise of participant #08, and talking about some of the constituent parts that make up counterfeit products that had been seized and tested, he said that;

“[Regulatory authorities] have done various analysis and these products were banned because they are either known or suspected to cause cancer in humans. Therefore there is no safe residue level... they are not permitted in the food chain whatsoever in **any** shape or form. So, for an approved pesticide part of the field trial and the testing regime would be to determine what is a safe maximum residue level left in the land or left in the crop. It can't exist for a banned product, there are no safe residue levels there”.

Perhaps of even greater concern participant #08 also said that one of the products tested;

“...contains a banned product at such a level that it is classed as a carcinogen causing cancer in humans and a mutagen, which means it will change DNA... cross the placental barrier and change the DNA of an unborn baby. Also a teratogen which means it will affect the DNA of the unborn baby and its future offspring as well. So this is serious stuff”.

Asked if there was evidence to indicate that this product had found its way into the UK market participant #08 then confirmed that it had, and that there was a genuine risk of residues in the food chain. The enforcement case study to be found at Appendix 4 gives a more detailed description of this product, its source, and how it found its way into the market.

Whilst some of the characteristics of the UK counterfeit pesticide problem described thus far were recognised in the literature, albeit in unsubstantiated and scant industry or media reporting, there were a number of significant factors which emerged

out of the stakeholder interviews that had not been previously recognised and which contradicted commonly held perceptions of the problem. First amongst these was that occurrence rates for counterfeit pesticides in the UK was very low, at least when compared to much of Europe. The scale of UK incidence must now be reconsidered in light of evidence presented by participant #08 who had obtained Her Majesty's Revenue and Customs (HMRC) financial data relating to one company and its network of subsidiaries that was suspected of distributing counterfeit pesticides under the guise of parallel trading. Having considered the evidence his view was that such was the scale of the likely fraud in this single example was sufficient evidence in itself to demonstrate that there was a **significant under estimate** of the UK problem (S=1, R=1).

In the period from March 2012 to December 2012 (ten months) this company imported over 3 million kilogrammes of a product into the UK that was declared as being for re-export. This product was not authorised for sale in the UK but it was suspected that it was destined to be sold as a parallel product into the UK market. Follow-up enquiries showed that only 220 kilogrammes had left the UK, the rest could not be accounted for. It was the view of participant #08 that this 'missing' product had entered the UK legitimate marketplace using the previously described process and illustrated both in the industry case study at Appendix 4 and in the 'hornet' model to be found at Appendix 5. Based on this incident participant #08 had considered the low UK incidence figure published by the ECPA and concluded that "the evidence shows that that figure was a wild underestimate". His own view was that "the UK figure is more than 10%... certainly" which reflected a more widespread abuse of the parallel trading system than had been previously suggested and indicates a problem more closely akin to the rest of Europe.

As has already noted scepticism about the efficacy of parallel trading rules was predominant amongst stakeholders but it was not unanimous. An alternative, and previously undocumented, perspective of the system, and one which contained some serious criticism of mainstream manufacturers, was also recognised amongst the expert views gathered. This **defence of parallel imports** (S=2, R=10) in the face of manufacturing company hostility toward the system was based upon a belief that while manufacturers are critical of the parallel trading rules, because they provide an opportunity for counterfeiters to exploit the market, they are also manipulating the regulations to their own benefit. Participant #09 described how he had personal experience of some manufacturers employing a “pricing corridor”, essentially a structure of price differentials across Europe. This was not necessarily meant as a complaint, because such differentials are the bedrock of legitimate parallel trading and without them there would be no profit to be made by moving product across Europe, and therefore there would be no incentive to trade. As participant #09 pointed out if a parallel trader identifies an opportunity created by a manufacture’s differential pricing regime and they wish to take advantage of that differential then regulations require that they make a permit application for each country from which they wish to acquire product to import into the UK. However, in practice a parallel trader will very likely go much further by making multiple applications in an attempt to disguise from the product manufacturer where they are actually intending to acquire product from. This practice was deemed necessary by participant #09 because he believed that manufacturers make considerable effort to identify where parallel product is being sourced and, having done so, they often make subtle variations to product formulation within that country. It is a practice that #09 called “locking it down by country”, a method he described as;

“A bit of a blunt instrument and they do risk the EU commission if there is enough complaints saying ‘hang on a minute’, because theoretically you are meant to have a technical reason for a difference between EU countries but...[participant stopped talking]”

The net consequence of this practice to the legitimate parallel importer was that if they continued to import product once this subtle formulation change has been made then they would technically be in breach of the requirement for a product imported under parallel import rules to be identical. A very similar product, which is what minor modifications to the pesticide formula would produce, would be deemed unacceptable in the eyes of the regulator. It was the view of participant #09 that this was the source of the UK ‘counterfeit’ problem; an industry generated issue designed to counter the economic challenge of parallel products<sup>61</sup>.

This alleged practice was not the only incidence of mainstream manufacturers being accused of manipulating parallel trading rules. Participant #05 described a practice that he had been witness to involving mainstream manufacturers actively colluding with what he described as “tame” parallel traders. He suggested that at the time he was involved it was not uncommon for a named manufacturer to “cut a deal” with an importer whereby they were supplied with product directly from the UK rather than from Europe and where he or she would “collect it from the factory gate”. This relationship allowed the importer to supply agreed amounts of legitimate product to his

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<sup>61</sup> This alleged practice was put to a manufacturer representative with knowledge of European wide product sales. Whilst he was not prepared to formally participate in the study he was willing to be cited on this particular point. He acknowledged that there may be technical reasons for minor inter-country product formulation variations but insisted that the practice was not used as an anti-parallel trade practice as has been suggested.

customers, at a price below the local market rate but more profitable than importing, whilst the manufacturer continued to segment the market. Participant #05 described this practice as a “back-to-back” registration<sup>62</sup>. Again it was suggested that regardless of the legality this was a restrictive practice and contrary to the spirit if not the letter of free trading rules.

Whilst these alleged practices remain unproven what was apparent was that legitimate parallel traders had not been averse to selectively pointing them out to farmers and growers. In doing so it had, as participant #09 observed, heightening consumer mistrust in what mainstream manufacturers are telling them about the “evils of parallel products” and as such may have inadvertently stimulated demand for such products.

Paradoxically despite the preoccupation on the part of some stakeholders with cross-European price differentials there was evidence to suggest that this was not the only, and possibly not the key **consumer motivation** for farmers buying parallel products (S=10, R=21). Indeed manufacturers were very keen to point out that differential pricing is largely a thing of the past. Participant #08 suggested that;

“There may be some examples where there's a product that could be very expensive in the UK on a certain crop that was perhaps offered in another European country at a much lower price. That would be relatively rare because companies, you know, since the advent of the European Union and the harmonized market companies have recognised that if you have big price differentials between countries then that can be exploited quite legitimately by

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<sup>62</sup> This practice was witnessed in approximately 1998. The participant believed it was still happening but did not provide a more recent example.

the parallel trade so it's tended to... I know we certainly have had price harmonization. There are always some differences caused by VAT, different VAT levels and so on but broadly speaking I would expect most companies to have price harmonization which means that there's less than ten percent price difference”.

As participant #04 noted this move toward price harmonisation was a pattern recognised by distributors, but interestingly not by those representing end users. Here we see an interesting difference of opinion with participant #03 believing that there were;

“Clear disparities across member states in terms of the cost of products so there are disparities and there are situations where products are brought in to the UK at a premium but they are already potentially available on Europe and so actually it is a lot cheaper to get the parallel traded products”.

Participant #03 continued by explaining that “small margins on high volume activities can make quite a significant difference” and that large farm enterprises will be constantly looking to the market for potential savings. This reflected the view of participant #07 who, speaking as a sometime distributor of parallel traded product, believed that there were some who will always buy the cheapest product on offer and “they won’t ask questions, they’ll just accept what they’ve been told it is”.

What is observed then is two very different understandings of the market; one that claims there is widespread if not universal price harmonisation and an alternative that suggests there is not. The latter would imply that price is still the defining feature of the trade in parallel pesticides, the former requires an alternative consumer driver.



Whilst not dismissing the argument that price differentials still exist, albeit at a much reduced level than was previously the case, a potentially more important influence over parallel product demand was recognised, and one that is compatible with growing price harmonisation - supply shortfall. As participant #02 explained;

“If, for example, we had a major problem with a particular pest in the UK one year, and there was a shortage of product available on the UK market, then some canny person might say that they would do some parallel importing from France or Germany, or wherever, to fill that gap in the market. So that can happen then, that’s not price driven, its availability driven...”

Participant #04 added to this in describing how shortfalls can occur as a consequence of unpredicted or unexpected weather or problems with a manufacturing facility to the extent that less product of a particular type is produced. That such shortfalls cannot be readily met was, as participant #03 explained, the result of widespread consolidation across the EU based pesticide industry with some companies having only a half or a quarter of the production plant facilities they had twenty years ago. Explaining the consequential lack of EU based manufacturing flexibility he continued;

“We have seen presentations from the major agchem companies showing that some products may cross the Atlantic Ocean 2 or 3 times in the mixing production process. And they are batched produced... so you get a batch of production and there won’t be another batch produced for 6 months. They get their orders in, they get their levels in... so what we are seeing increasingly across Europe is these gaps getting created...”

Participant #01 contributed to this strand in pointing out that China, the believed source of the majority of counterfeit products, had undergone rapid growth in its chemical manufacturing capacity (including pesticides) giving much greater capacity to respond to product shortfalls when they occur. When an unanticipated spike in demand for a particular product occurs, producing the “gaps” that participant #03 referred to, then an opportunity is created for the parallel product trader. However, what was questioned by several participants including #05 was, in the circumstances described, the extent to which the legitimate parallel trade could fill these gaps. Given that product shortfall is rarely a localised event, “pucker parallels” as he described them are only likely to be available in small volumes across Europe, and they are unlikely to be cheap enough to make importing, repacking, and distributing them commercially viable. However, it seemed that these shortfalls are regularly met by parallel traded product. This prompted participant #02 to ask “you know, can it really be a genuine parallel import? No-one’s going to do it at a loss?” Interestingly it was in exactly these circumstances that farmer participant #18 acquired a product that was very likely to have been a counterfeit.

In terms of defending the UK market from such products it was apparent from the stakeholder interviews that considerable faith was placed on the integrity of the UK **supply chain structure** (S=8, R=29) to prevent illegal pesticide from reaching farms. A correlation between the typical European mainland trading pattern where the purchase of farm inputs is dominated by buying groups, seen for example in France, Spain and Italy, and a higher incidence of illegal parallel product was suggested by participant #04. Extended supply chains, such as those observed by participant #05 in Germany where product may be traded through a network of wholesale distributors before reaching the end user, were also seen as creating an opportunity for illicit product to

enter the legitimate market. A simple case of the more people involved in the distribution process then the greater the risk of interface with organised criminality. In sharp contrast participant #05 described the condensed supply chain that is more commonly seen in the UK; typically manufacturer, to distributor, and then directly to farm. As importantly there was a strong sense across the sample group that the UK pesticide supply sector is one built on a trusting relationship between the distributor, the farmer, and his or her agronomist and that this significantly reduced the risk of a counterfeit finding its way on to farm. A business relationship of twenty or thirty years was, as participant #04 pointed out, not unusual and, as #03 described;

“A lot of people have established relationships with their agronomists... long standing relationships. We often joke is that people talk to their agronomist more than they talk to their wife. But it is true the relationship with the agronomist is very often very long standing working relationship”.

Interestingly it was to an agronomist that farmer victim #18 turned for advice, rather than a representative of any enforcement agency, when he suspected he had been sold, and had used, an illegal pesticide.

Participant #05 contrasted this with other parts of Europe;

“As I say a farmer here will really do what he is told... almost. Whereas if you go to Eastern Europe I think counterfeits are easier because the manufacturers create a demand for the brand and the farmer is probably making a decision on

what he is going to do based on what he has read in the paper or seen at the local agricultural show or something. More than he would over here”.

That said this somewhat rosy characterisation of the traditional UK agricultural distribution network was moderated by an alternative view that all may not be what it seems. Participant #02, whilst very supportive of the distribution trade, was of the view that some dealers may not fully understand what parallel trading rules require of the importer in terms of a product being identical and, less widely appreciated, that it has to have been on the market in the country of origin in its final form (rather than imported in bulk). Participant #02 was certainly somewhat sceptical about “what the distributor is doing to make sure that they have got a genuine product”. This potential supply chain weakness was also recognised by participant #06 in whose experience it was the smaller distributors, rather than what he described as the national distributors, that provided the most ready market for the importer of counterfeit parallel products. Without defending their position participant #05 pointed out that these smaller distributors had been forced down the parallel trade route as industry consolidation had essentially squeezed them out, mainstream pesticide manufacturers preferring to deal with the handful of national distributors. This potential market for illicit product was seen as further facilitated by a suspicion about the true independence of agronomists working alongside some distributors. As participant #07 pointed out;

“Farmers are under the control of their agronomists. The farmer will take their recommended prescription and do what that agronomist suggests and the agronomist is rewarded accordingly... so it is financially driven for them”.

The implication here was that a farmer would not necessarily question the source or legitimacy of the product they were being recommended to use, leaving them vulnerable to a counterfeit if the supplier or agronomist were not entirely above reproach.

Partly in defence of the legitimate advice and supply sector participant #09 suggested that whilst dubious practice could be found it was not an endemic problem. His experience was that a single company was trading a very significant proportion of the illegal product entering the UK market, and this seemingly unhindered by regulation or enforcement;

“They set up a company called [name redacted] which was going to do everything over the internet, which subsequently became [second name redacted]. I would estimate probably 60% or more illegal material is handled by [name redacted]. Because they do it as a buying group they don’t care. And as far as I can tell their farmers get offered... this is one product, this is the proper product [indicating two alternatives]... you make your choice”.

It was the view of participant #09 that farmers dealing with this company were probably fully aware of the status of the product being offered, as he said “there are farmers that buy products pounds below... well, you can’t say you don’t know its hooky”. This view of a section of the market operating with clear knowledge of illegality was one reinforced by participant #08 who drew an analogy;

“If someone offers you a 50 inch plasma screen in a pub for £15 it cannot be genuine. There is a market range for these products in terms of the price. If somebody is selling a branded product as two thirds the price of the branded product then I would say to a merchant come on, you have to be suspicious of this. Where has this product come from if it is supposed to be the branded stuff?”

Whilst it was the majority view that it was a small minority of distribution companies that were knowingly dealing in counterfeit product it was the view of some, including participant #07 that the problem was still “wide scale”. This begged the obvious question as to how such criminality is going unnoticed. It was a point addressed by participant #08, considering the position of enforcement agencies, who suggested that when an end user becomes suspicious;

“Their recourse would be to the merchant to say ‘this product you sold isn’t working’, and the merchant would then give them another product in good faith because they are anxious to protect their customer and their good name”.

He continued by suggesting that enforcement agencies would rarely even hear about it, as was again the case with farmer victim #18 who made no contact with the police or regulators even when he was certain that the product he had been sold was illegal.

This industry ‘closed circle’ goes some way to explaining the apparent invisibility of counterfeit pesticides in the UK marketplace, however, other factors emerged from the interviews which may contribute to the problem being hidden in plain

sight. The first of these recognises that the agricultural sector is not the only significant market for pesticides in the UK. Several participants were keen to point out that the demand for pesticides by the **amenity market** rivals that of the agricultural industry (S=4, R=10). As participant #21 put it “the amenity sector is huge... it is massive”, albeit the product range is much narrower, predominantly herbicides, participant #15 noting that “there are fewer products approved for use than there are in agriculture”. Participant #16 exemplified the range of the amenity use of pesticides in the UK:

- Highways (local authorities);
- The railways (Network rail);
- Sports (playing fields, golf course etc.);
- Service Stations;
- Supermarkets;
- Car Parks;
- Woodland Management.

He acknowledged that this was probably not a comprehensive list, but was able to state with confidence that the biggest single amenity user of pesticides was Network Rail with local authorities collectively accounting for the greatest proportion at something over half. Participant #16 went on to say that the amenity market would probably account for something in the order of 8-9% of total UK pesticide usage in the UK in any given year.

Despite its widespread use of such products the **characteristics of the amenity pesticide market** (S=4, R=12) were recognised as being markedly different from the agricultural sector. However, understanding the true nature of this market was seen as inherently problematic because reliable data is hard to come by. Participant

#21 described how “we can’t quite get the information like we can with the agricultural side of things... because there are just so many of them [amenity sector pesticide users] out there doing it”. This absence of data was probably due, as participant #21 described, to “the amenity sector has always been just below the parapet, they’ve always just kept their heads down”. By contrast the agricultural sector was seen as being comparatively open about its pesticide use, a consequence, participant #22 suggested, of the need to satisfy crop and food assurance schemes and, as participant #21 noted, the resulting need for total input traceability. There is no such traceability imperative for inputs in the amenity sector.

Several other marked differences to the agricultural sector were also described, including the absence of an equivalent to the advisor (agronomist) and the agricultural supplier trust relationship previously discussed, a factor highlighted by participant #16. Similarly the lack of a structured system of pesticide store inspection, which is integral to the majority if not all agricultural crop assurance schemes, was also commented upon. This second difference was deemed particularly significant by participant #21 who pointed out, in referring to pesticide stores in the agricultural industry, that;

“Someone is usually going in to inspect them on an annual basis to look at what they’re doing, what the products are, what they look like. The store keepers are trained to identify potential counterfeit products coming into their store. The amenity industry have not got that”.

In considering the significance of the amenity market in the context of the counterfeit pesticide problem the characteristic that was foremost in the interview data was that weed control work is predominantly contracted out by authorities and corporate bodies, and that price is the overwhelming consideration in the awarding of



such contracts. As participant #22 pointed out when considering the consequences of the contracting out of, for example, roadside weed control;

“When you've had a spike of weed growth contractors who in nine months of the year don't need to employ say ten knapsack sprayer operators all of a sudden they've got a requirement for five or six more people. They just take five or six more people off the dole or wherever... and they're not necessarily qualified”.

This lack of qualification on the part of casual spray operators, despite the regulatory requirement for training, was seen as a common cost reduction practice on the part of contractors and one that carried little risk of penalty. As participant #15 commented “it's not policed... there's no one around saying have you got, can I see, your qualification”.

The experience of participant #16 of this market had led him to conclude that there had been a growth in the number of knapsack operators because this was the cheapest way to control weeds. Those authorities or corporate bodies awarding contracts generally did so to those tendering the lowest price, and naturally those offering the cheapest price were able to achieve this by minimising their own costs. Not only did this result in the use of untrained operators as described but, as participant #21 had observed, it led them to find the cheapest available **product source** (S=4, R=6). Participant #16 described how large contract companies' sub-contract to “man in a van” operators, and that these small operations generally acquire pesticides on the open or spot market. This may bring them into contact with sources that are not averse to trading illegal product. There was a general view that these sources were likely to be internet based, participant #21 describing how “there are so many companies out there supplying this market, putting the processes in place... the market must be there for it”. The fact that, to comply with the prevailing regulations, a purchaser acquiring

professional pesticides through an internet source must still hold the appropriate qualification seemed to matter little because;

“You could buy it now from [named several on-line trading sites]. All that comes up is a little warning that says this is a professional pesticide. But you can still buy it, whether you’re qualified or not”<sup>63</sup>.

Those participants with experience and knowledge of the amenity market were all asked if they believed this pattern of trading could provide opportunity for the pesticide counterfeiter to access the UK market. Unanimously they believed it could, participant #22 being typical in responding;

“I would say so. I would say there are some very professional companies working in the amenity industry and they’re purchasing products from distributors who work in the agricultural sector, so there is one very professional end of it. But then you’ve got the numerous smaller people who are accessing or purchasing product from unregulated sources and that’s a concern”.

Crucially participant #08 was also able to confirm that, looking at the same issue from the standpoint of pesticide regulation enforcement, the final link in the counterfeit pesticide supply chain in the UK was very often a named retailer that specialises in sales into the amenity market and has a significant online presence.

This sub-group of participants were particularly interesting because they

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<sup>63</sup> In the interest of testing this claim the author accessed the named sites and would, as suggested, have been able to purchase large quantities of a professional pesticide without any check of professional status or qualification.

illustrated very well a point that recurred throughout this phase of the research; that across the industry there exists is a great depth of **industry knowledge and intelligence** on the subject (S=4, R=7). This is self-evident from the narrative presented thus far, but what was surprising was that there appeared to be little in the way of facility to make use of that intelligence as a means of mitigating the counterfeiting problem. This issue was highlighted by participant #01, whose experience was that “the difficulty for an agency is gathering the intelligence to actually take action”. The emphasis here was very much on the problem of gathering, rather than any suggestion that the intelligence did not exist.

There was some industry suggestion that efforts had been made to liaise with enforcement agencies, but this seemed to have been almost exclusively outside of the UK and predominantly in support of Europol<sup>64</sup> and the European Anti-Fraud Office (OLAF)<sup>65</sup> sponsored initiatives. OLAF in particular had been active in addressing the rapid growth in high-quality counterfeits appearing in Poland and, as participant #01 explained, manufacturers had supported this initiative both financially and in terms of relevant market information. Whilst several participants were aware of industry collaboration with CRD to address specific regulatory offences there was no evidence to suggest that any similar collaboration had occurred to share intelligence with other UK enforcement agencies and, more specifically, the police. With his longstanding

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<sup>64</sup> Europol, an abbreviation for the European Police Office, is the law enforcement agency of the European Union and is tasked with combating serious organised crime. It collates criminal intelligence from European Union member states as part of its remit. Europol has publicly commented on the growth in the trade in counterfeit pesticides and organised crime (Europol, 2012).

<sup>65</sup> OLAF, from the French Office Européen de Lutte Antifraude, is the European Ant-fraud Office and is an agency of the European Union. Its primary task is tackle fraud affecting the EU budget and its activities in relation to counterfeit pesticides recognises that this trade generates large illicit profits and significant losses of tax revenue. The initiative referred to by participants resulted in the seizure of 21 tonnes of counterfeit and illicit pesticides (OLAF, 2014).

experience of enforcement practices in the field of counterfeit pesticides participant #08 was able to say with confidence that the police held primary responsibility for investigating the fraud element of this crime. This failure to properly engage with enforcement agencies was recognised as a shortcoming. As participant #05 suggested;

“It does need an enforcement agency. It doesn’t need to be a vast agency. It needs somebody who will take responsibility for picking up the intelligence, making the analysis, and then coming up with a case that will stick...”

It was somewhat ironic then that participant #08 should point out that “the difficulty for an agency is gathering the intelligence to actually take action” despite the fact that the value of such intelligence was universally recognised. Participant #01 exemplified the potential of intelligence as a preventative tool saying “the more intelligence we build the more we can indicate to markets that illegal product is on its way”. However, there was a strong sense that not only does intelligence not reach enforcement agencies but it is rarely discussed let alone shared within the industry.

Any notion that there might be industry collaboration to tackle this problem through the collective use of intelligence was effectively dismissed because of what might be described as **constrained knowledge sharing** (S=6, R=8). This was well summarised by participant #04 who, when talking about the problem, said “of course we never discuss it with the trade association because of anti-competitive laws”<sup>66</sup>.

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<sup>66</sup> United Kingdom statute concerning competitive practices is largely contained within the Competition Act 1998 and the Enterprise Act 2002. In this case, because of the pan-European nature of the pesticides industry, there is a further European element and a number of Articles

Referring to legal constraints on any business practice that might restrict free trading participant #06 explained;

“It’s been problematic for us...we’ve tried to, we’ve tried to do some of this in the past but we’ve always... you know, we’ve always consulted with our legal teams who’ve said that we shouldn’t share information as an industry directly with each other”.

This commonly held view overwhelmingly influenced the way intelligence concerning counterfeit products in the market place was managed by manufacturing companies and trade associations. However, it was not universally recognised as a complete barrier to cooperation. There was an alternative industry view, typified by participant #13, that the strict interpretation of the rules by commercial lawyers unnecessarily hindered “the exchange of operational information on crime”. Moreover participant #12, who had a great deal of experience in the handling of commercially derived intelligence, suggested that such concerns could be overcome by placing the collation of intelligence in the hands of a trusted independent third party. What was also clear was that despite the collective sense of impotency in relation to the use of intelligence the industry had made considerable efforts in other directions to reduce the risk posed by counterfeit products.

In terms of a **response strategy** (S=10, R=33) stakeholder focus was very much on regulatory and legislation change. There was substantial evidence of a growing anger with the prevailing regulatory framework and its inability to protect

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within the Treaty on the Functioning of the European Union (TFEU) deal specifically with unfair business practice.

legitimate manufacturers. Certainly some saw themselves as the victims rather than beneficiaries of rules designed to protect free trade within the EU. Regulations that allow products to be shipped in constituent parts relatively unhindered were recognised as a direct threat to legitimate manufacturers and were described by participant #01 quite bluntly as “a stupid law”. It would be fair to say that across manufacturer stakeholders it was reform of the rules and regulations pertaining to parallel trading that overwhelmingly dominated thinking as to how the UK counterfeit pesticide problem should be tackled. However, such reform was not seen as being a universally good thing. Participant #09, an experienced trader in parallel products, pointed out that this would certainly impact upon legitimate traders in parallel import pesticides, to the extent he suggested that some would cease to trade. However, such changes would not necessarily influence the counterfeiter because “if you are determined to act illegally none of this affects you in the slightest”. Understanding this potential impact on legitimate parallel traders was not raised as a concern by mainstream manufacturers, who, as participant #09 also pointed out, see such traders as a commercial threat.

Whilst regulatory change dominated stakeholder attention other potential means of responding were recognised. This included raising end user awareness of the threat posed by counterfeit pesticides (S=10, R=33). Amongst the initiatives mentioned by participants, including #02, the most prominent was the *Watch out! For illegal pesticides* campaign lead by The Voluntary Initiative<sup>67</sup>. Launched in January 2014 the campaign, as participant #03 described, was intended to make end users aware of the threat to the extent that they might “push back if there were questions in

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<sup>67</sup> The Voluntary Initiative is an industry sponsored group which promotes the responsible use of pesticides. It has its origins in a proposal put to Government in 2001 by the farming and crop protection industry to minimise the environmental impacts from pesticides (The Voluntary Initiative, n.d.).

their minds”<sup>68</sup>. This industry backed campaign met with universal approval amongst those who were aware of it, however, some, including participant #06, believed that regulatory authorities should be similarly active saying that;

“I think from a pesticide regulatory point of view the authorities can do a lot more to communicate to farmers and to the distribution channel about the risks of illegal and counterfeit pesticides...”

Other response strategies identified by participants included internal company initiatives, common to all the manufacturers in some shape or form. Broadly these were split into preventative measures, such as security features on packaging like the intaglio labels<sup>69</sup> described by participant #01, and post event measures, typified by participant #06 who described how company expertise would be employed on a case by case basis to determine whether an incident of their product being counterfeited should attract further investigation and potentially legal action (assuming enough evidence could be found). However, there was a noticeable lack of emphasis on company sponsored initiatives to influence consumer motivation with regards to counterfeits. Manufacturers, and perhaps more commonly representative trade bodies, were actively campaigning for a change in the rules pertaining to parallel trading, and

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<sup>68</sup> At the point at which the interviews took place no follow-up research had been conducted by the Voluntary Initiative to ascertain the effectiveness of the campaign.

<sup>69</sup> Intaglio printing is a method that essentially embosses the surface of a pesticide container leaving a heavy ink deposit. It is a relatively expensive process because the etched impression cylinders cost tens of thousands of pounds to produce, but it is regarded as a sophisticated security technique. However, some have suggested that a similar effect which would deceive many consumers could be achieved by a counterfeiter using thermography inks (Security printing.co.uk, 2013).

specifically as participant #02 noted for the rule allowing the re-packaging of pesticides on import to be removed. This was accompanied by a desire, typified by participant #06, for much greater penalties to be made available to prosecutors. Whilst it was suggested that this may act as a deterrent to would be counterfeiters this was tempered by an acknowledgement that higher penalties are largely irrelevant unless enforcement agencies actively engage with the problem, and the prevailing view was that they did not. With this in mind, and in addition to the need to share intelligence which has already been discussed, there was a belief amongst participants that there was an urgent **need for greater enforcement agency awareness** of the problem both at strategic and at operational levels (S=2, R=4). This was made clear by participant #06 when exclaiming that “there’s a hole in the ship and, you know, water is coming in. We have to do something about it”. He continued “we really need to step up the work with customs and police and, you know Trading Standards, whatever it may be to effectively act against illegal pesticides”.

In seeking evidence of any corresponding **enforcement agency engagement** with the counterfeit pesticide problem (S=7, R=27) it was apparent that industry participants had firm views as to what was required but could offer little evidence of any tangible response. Participant #06 summed up the prevailing industry sentiment when he described enforcement agencies as being largely naïve about this problem and certainly unclear as to their individual areas of responsibility. Whilst there was some evidence, such as that provided by participant #01, of industry cooperating with the Health and Safety Executive under the auspices of CRD this regulatory enforcement body was generally seen as being poor at conducting action against offenders. Participant #05 suggested that “CRD aren’t very good at bringing cases... most of them fail at some point or another”. Beyond this limited engagement participants were sceptical about the extent to which it is currently possible to work with any of the



relevant agencies. Participant #01 was of the opinion that Trading Standards were “used to wellies with holes in the bottom and cleaning products that don’t work” but were not used to this scale and complexity of offending. Interestingly the lack of Trading Standards operational appreciation of this issue was discussed by participants #14 and #17, who confirmed that they had no documented case of their having dealt with a counterfeit pesticides case. The police were also seen as being ignorant of the scale or potential impact of this crime. Participant #01 recognised a pressing need for operational police officers to be made aware of the threat posed by counterfeit pesticides to the general public because, as participant #06 put it, “there’s been a polite indifference, a lack of recognition of the scale of the problem... frankly really complacent”.

This seeming lack of police engagement was the subject of interviews with those responsible for the setting of the **police rural crime priorities** within the sample police force (S=4, R=10). Out of these interviews emerged evidence that this failure on the part of the police to even recognise the UK counterfeit pesticide problem may be a direct consequence of the very narrow scope of what they deem to be rural offending. Certainly within the sample force the strategic perception of what constitutes rural crime was very narrow. At least in part this may be attributed to the inherently problematic nature of defining what was meant by the very term. As participant #19 acknowledged, when describing how the parameters of rural crime recording were set within this large non-metropolitan police force;

“What it actually came down to was almost crimes against the farming community. CCMT [Chief Constable’s Management Team] did consider looking at a location base and defining a neighbourhood or a part of an LPA [Local Policing Area] as rural by definition. They chose not to go down that route...

because you bring in lots of stuff that's not peculiar to the rural community. It's terribly, terribly complex”.

He went on to explain that with their own chosen definition “we basically ended up with crimes being committed in an agricultural environment”. More precisely;

“By narrowing it down to looking at the farm and agricultural community you do get a sense of something that is peculiar to the rural location... so we ended up with something like farm machinery. Easy to define, easy to say, well, that was a deliberate act against specialist equipment which is peculiar to the rural community”.

It was a conundrum recognised by participant #20 who, when asked to consider how inclusive the chosen definition really was, replied;

“It's a very difficult question to answer. There was a particular sort that you could define as rural crime and it was the nicking of tractors and agricultural machinery, and hare coursing... which you could put firmly into the rural crime bracket. But the fact was it [rural crime] extended beyond that”.

The inclusion of hare coursing was of considerable interest because, as participant #20 explained, “things like hare coursing, which per se aren't major crimes, very often are a precursor to more serious crime”. It was a feature that participant #19 explained had led to this crime being included in the force's rural crime strategy specifically because

of its links to wider OCG activity.

Having recognised the limited scope of their force's definition of rural crime when asked to consider what had influenced it both participant #19 and #20 acknowledged the influence of a third party organisation; the National Farmers Union (NFU), and more specifically its sister organisation responsible for insurance activities the NFU Mutual. Participant #20 described how using insurance company data concerning the theft of equipment from farms provided a pragmatic measure of 'success' in terms of rural policing;

"National Farmers Union Mutual insurance claims were down 19% in [name of police force] last year... they went up 5% nationally. So, rural crime has been reduced substantially in the [name of police force] because we've made an effort and we've joined it up... we made a huge effort to stop the theft of heavy plant and machinery".

Participant #19 was clear that this link between 'rural crime' and 'farm theft' would probably strengthen, to the extent that the NFU would become the de facto arbiter of rural policing performance, suggesting that;

"For next year I've recommended to CCMT that to judge rural crime, and any changes in rural crime, we go to a partner agency, the NFU, and ask for their data because when they published their claims data this year 2014 it was a very positive picture".

Participant #19 continued by explaining that this approach was necessary "because they [senior management] all want data, they all want numbers" and "in terms of

churning over data that's reliable the most reliable data is if NFU [Mutual] aren't paying out then we're making a difference".

It seems then that, at least at a strategic policing level, there is a demonstrable link between an insurance company, with its focus on theft from farms, and the approach to rural policing adopted by at least one police force with a significant rural responsibility. The qualitative Freedom of Information Act request element of the study was designed to expand the data on the strategic police rural crime focus by examining the extent to which other police forces have considered what constitutes 'rural crime' and whether any associated policy or strategy is sufficiently inclusive to accommodate the counterfeit pesticide problem. Given the findings of the in-depth interviews the data was also examined for evidence of a similar focus on theft from farms.

### **5.1.2 Qualitative Freedom of Information Act requests**

Designed to determine the extent to which the trade in counterfeit pesticides is either recognised in police rural crime policy or can be readily accommodated by such policy Freedom of Information Act (FOIA) requests were sent to the forty five police forces in England and Wales, Scotland, and Northern Ireland. Forty two forces responded, of which fourteen forces had a definition of rural crime and an associated policy/strategy. Of the remainder five forces had defined their understanding of what rural crime meant but did not have an associated policy/strategy, and four forces had a policy/strategy but lacked a clear definition of what constituted rural crime. Nineteen forces had neither definition nor policy/strategy<sup>70</sup>. A summary of these returns can be

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<sup>70</sup> It is worth noting that in the analysis of police forces undertaken to identify a suitable subject force for in-depth interviews, and described in the research methodology, a number of forces

found at Table 5.3. Where a response included an additional narrative this was also considered as part of the qualitative data<sup>71</sup>. As with the results of the in-depth interviews the data categories (nodes) that emerged from data coding are given in Table 5.1 and are shown in bold in the summary that follows along with the number of sources (S) and the total number of references (R) to the node subject.

In seeking evidence of a **national police definition of rural crime and associated policy** (S=13, R=14) there was very little consistency across forces. Some, including Bedfordshire Police, Cambridgeshire Constabulary, Northamptonshire Police, and Thames Valley Police, had adopted either in whole or in a personalised form a draft definition that the Association of Chief Police Officers had promulgated in 2014. The Northamptonshire Police version closely reflected the original, recognising a crime as being 'rural;

- If the offence occurred at a farm barn, farm shop, farm building, farm yard, farm house, farm field, fish farm, field, stable, barn or outbuilding;
- Or the property involved is agricultural machinery, agricultural tools, fencing, hay/straw, heating oil and red diesel, horses and or tack, horse boxes or livestock;
- And the offence is burglary, robbery, theft or criminal damage. In addition, wildlife offences, hare coursing and poaching offences are covered within this definition.

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were identified that were almost entirely urban in character. Including the Metropolitan Police, Greater Manchester Police, West Midlands Police, Merseyside Police, and the City of London Police these forces, for obvious reasons, had neither definition nor policy associated with rural crime.

<sup>71</sup> FoIA requests to the police and their responses are made publicly available, generally on the force's website. For this reason it was not deemed necessary to anonymise the data.

**Table 5.3:** Summary of responses to qualitative police FoIA requests (Y=yes, N=no).

<b>Request directed to:</b>	<b>Rural crime definition</b>	<b>Assoc. policy/strategy</b>
Avon and Somerset Constabulary	Y	Y
Bedfordshire Police	Y	Y
Cambridgeshire Constabulary	Y	N
Cheshire Constabulary	Y	Y
City of London Police	N	N
Cleveland Police	N	N
Cumbria Constabulary	Y	Y
Derbyshire Constabulary	Y	N
Devon and Cornwall Police	Y	Y
Dorset Police	Y	Y
Durham Constabulary	N	N
Essex Police	Y	Y
Gloucestershire Constabulary	N	Y
Greater Manchester Police	N	N
Hampshire Constabulary	Y	Y
Hertfordshire Constabulary	N	N
Humberside Police	N	N
Kent Police	Y	N
Lancashire Constabulary	N	Y
Leicestershire Police	N	Y
Lincolnshire Police	N	N
Merseyside Police	N	N
Metropolitan Police Service	N	N
Norfolk Constabulary	Y	Y
North Yorkshire Police	Y	Y
Northamptonshire Police	Y	N
Northumbria Police	N	N
Nottinghamshire Police	Y	Y
South Yorkshire Police	N	N
Staffordshire Police	Y	N
Suffolk Constabulary	N	N
Surrey Police	N	N
Sussex Police	No response	
Thames Valley Police	Y	Y
Warwickshire Police	Y	Y
West Mercia Police	Y	Y
West Midlands Police	N	N
West Yorkshire Police	N	N
Wiltshire Police	N	N
Police Scotland	No response	
Dyfed-Powys Police	N	N
Gwent Police	N	N
North Wales Police	N	Y
South Wales Police	N	N
PSNI	No response	

This definition arguably prejudices any crime that takes place in the rural setting, and has a significant rural connotation, but does not occur on a farm or similar establishment. Moreover the focus is very much on property related crimes, with some degree of acknowledgement of wildlife crimes. Moreover where forces had chosen to create their own definition by and large they also reflected this bias toward property crime. This was epitomised by Dorset Police who stated that;

“The working definition of rural crime operated by Dorset Police is any ‘non-dwelling burglaries’ and ‘theft other’ offences which occur within any of the 5 Dorset Police sections defined as rural”.

A similar sentiment was to be found in the Kent, where the police had concluded that;

“Rural Crime is a broad encompassing title that generally refers to the theft of farm equipment, destruction of property and harm or theft of livestock. It also includes wildlife crime, environmental crime and heritage crime and is defined for recording purposes by its geographical location”.

Perhaps the narrowest focus on theft was to be found in Norfolk Constabulary where the Constabulary’s Joint Performance and Analysis Department had, for the purposes of crime recording, deemed rural crime to be the “theft of tools/farm equipment/batteries/hedge cutters/chainsaws/tractors etc. from rural locations and farms”.

One notable exception to this pattern of narrow perception was observed in the Cheshire Constabulary definition which acknowledged that many of the crimes that occur in an urban setting will also occur in the rural setting but may be experienced differently by virtue of location. Nonetheless even the most encompassing definition of rural crime did not include any emerging technical crimes such as counterfeit pesticides. Indeed one force, Nottinghamshire Police, essentially dismissed the problem as being entirely outside of their remit suggesting that the issue should be **referred to another agency** (S=1, R=1) saying;

“Counterfeit pesticides are unlikely to be treated as rural crime and such matters are dealt with by other enforcement/regulatory bodies, much the same as counterfeiting of other goods”.

Nevertheless, and despite this apparent dismissal of the problem as anything to do with the police, there was some evidence of the **rural crime/organised crime link** (R=7, S=13) being recognised and the consequential need for intelligence gathering. As Hampshire Constabulary state;

“Organised crime is not just an urban phenomenon. The potentially high financial rewards, combined with the general remoteness of rural locations, provide a fertile ground for organised criminal gangs from across the UK and from overseas”.



Perhaps understandably (for reasons of not wishing to disclose police tactics) very little was found in the responses to suggest how the police would respond to the OCG link. However, Lancashire Constabulary had published an overall strategy which was that;

“Organised crime groups will be mapped and monitored by both Force and local intelligence units. Actions will be tasked to the most appropriate resource for disruption and investigation into their criminal activity. This will incorporate the use of specialist departments such as Ports Unit and the Serious and Organised Crime Unit”.

Aside from this recognition there was also some evidence of police forces being willing to step beyond the core policing function when a particularly insidious and specifically rural crime was identified. **Hare coursing** (S=5, R=5) is a practice outlawed under The Hunting Act 2004 and crucially it is an activity where forces have forged a link between it and more serious offending. In those forces with a significant rural area it is a crime that attracts considerable attention despite it being an offence that, more often than not, is investigated by a non-police prosecuting agency<sup>72</sup>. Moreover, the same force that dismissed counterfeit pesticides as not being a police problem, Nottinghamshire Police, saw fit to encompass hare coursing in its definition of rural crime. Given the seemingly narrow property crime focus of rural policing this may be significant for the future policing of the counterfeit pesticide problem if it is indicative of

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<sup>72</sup> Hare coursing is an offence that is regularly investigated by the RSPCA who have pursued prosecutions since the introduction of legislation pertaining to hunting with dogs in The Hunting Act 2004.

a widespread police willingness to engage with non-core policing matter, at least where it can be shown that there is the potential to impact upon organised criminality.

### **5.1.3 Oral history interview**

This phase of the research was designed to address an obvious gap in the literature; there was no documented case study of a counterfeit pesticide being sold to and subsequently used on a UK farm (research Q.3). To address this gap an interview was conducted with a farmer victim who agreed to share his experience. The results of this interview were both coded and formed part of the stakeholder interview data, and will be used as a source of example in the discussion chapter of the thesis. It is presented here as a narrative summary without further comment:

Study participant #18 farms in the subject police force area, his enterprise consisting predominantly of combinable crops (in the order of 200 hectares). His crop rotation includes spring oil seed rape (SOSR) for which his planned pesticide spray regime includes the use of a pre-emergence herbicide for broad-leaved weed control. He has a favoured product for this purpose but at the time of the incident now described, which occurred the year prior to the start of this study, climatic conditions over the autumn and winter had led to a significant increase in the amount of SOSR being planted. This had generated a high demand for this particular product and it was in short supply.

Participant #18 is a member of a buying group, through which he normally purchases crop inputs including pesticides<sup>73</sup>. Responding to the lack of product

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<sup>73</sup> Farmer buying groups tend to be farmer owned and controlled and may operate as a mutual co-operative and be non-profit making. They are sometimes known as supply co-operatives where their function is solely to aggregate purchases, store, and distribute farm inputs.

availability the buying group sourced and offered what they described as the same product acquired through the parallel trade, which had originally been offered for sale elsewhere within the European Union. The product carried an alternative name given by the importer, as is common practice and allowed under parallel trading rules.

The product was used in the normal course of events ostensibly without incident. However, participant #18 became suspicious that something was amiss when a noticeable amount of vegetation some distance beyond the boundaries of the sprayed area became bleached. This included a number of well-established trees. He was also concerned that the product had not worked as well as he would have expected; there had, for instance, been some noticeable crop damage. However, because he had no practical means of benchmarking its efficacy he had no way of knowing if this was actually the case.

His suspicions were further heightened when a neighbour to the farm complained that, following application of the product on nearby fields, a number of shrubs in his garden had suffered similar bleaching damage. Ordinarily this might have been attributed to spray drift, but on inspection the pattern of damage indicated that this was unlikely, the seemingly random pattern being entirely atypical. Coincidentally at about the same time participant #18 also attended a farm walk on another farm in the area where the host made comment that he had also used this alternative product, sourced from the same buying group, and that he had experienced considerable blocking of the nozzles on his sprayer<sup>74</sup>. Whilst talking to this farmer participant #18 looked beyond the boundaries of the fields where this product had been used and he

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<sup>74</sup> Industry and media coverage of the potential consequences of using a counterfeit pesticide often contains a warning that such products are prone to blocking sprayer nozzles and are therefore less effective and can result in costly repairs. See for example Garvey (2014).

noticed similar plant damage to that he had experienced on his own farm, again this included some mature trees which were noticeably bleached down one side.

This particular herbicide's mode of action is through the inhibition of the biosynthesis of photosynthetic pigments leading to leaf bleaching on susceptible weed species within the sprayed area. The damage could therefore be reasonably attributed to the active ingredient in the herbicide. Importantly this particular ingredient is known for its volatility. However, in order to reduce the possibility of evaporates drifting beyond the target area and causing the type of damage described above this active ingredient is microencapsulated<sup>75</sup>. This particular product was described by the manufacturer in their product literature as incorporating 'advanced microencapsulated technology', this being one of its key selling points.

Participant #18 is a very experienced user of commercial pesticides, being BASIS trained and registered<sup>76</sup>, and he suspected that the prevailing weather conditions may have been significant. At the time of the product being used there had been a series of very warm, still days with a significant drop in the overnight temperature. The land he farms is susceptible to localised temperature differences – there are often noticeable warm and cold spots when walking across fields at night, particularly during periods of marked day/night temperature contrast. Participant #18 suspected that the consequential advection of air, containing the product evaporates, was most likely to have been responsible for the seemingly random pattern of non-target plant damage. Naturally he complained to the manufacturer, acknowledging that

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<sup>75</sup> Microencapsulation is a technique used in numerous manufacturing processes, including some pesticides. It involves particles or droplets being surrounded by a coating to prevent the degradation, or in this case the volatilization, of the active ingredient.

<sup>76</sup> BASIS is an independent standards and auditing organisation for the pesticide, fertiliser and allied industries.

this had been a parallel traded product but pointing out that this was still their product albeit repackaged and rebranded by the importer. He suggested that the microencapsulation process had failed and as a consequence volatilization had occurred and that this was responsible for the observed non-target plant damage.

The company was sympathetic but explained that, despite this being sold as a parallel product, they had experience of the parallel trader responsible for the import (which was not the farmer buying group from which the product was purchased) and that this was probably not a genuine product. They further suggested that it was likely to be a copy product that did not have the microencapsulation technology. Subsequently a representative of the manufacturer of the genuine product visited the farm and inspected the damage stating that it was, as far as he was concerned, “a classic case”. Following this conversation participant #18 was obviously alarmed because it appeared that he had been supplied with and had used a counterfeit product. In an attempt to try and either confirm or dismiss this possibility he laboriously went through his accumulated waste product packaging and found the cardboard containers within which the herbicide bottles had originally been delivered. He then peeled back the English printed label on the box to reveal a smaller label underneath. He describes this label as being printed in what he believed to be Russian or a similar Slavic language.

In subsequent conversations with the genuine product manufacturing company participant #18 gathered that they had tried to do something about this counterfeit product, having gone as far as taking legal proceedings against the importer. Unfortunately, and despite a lengthy and expensive legal process, at court the Judge had failed to recognise the distinction between a ‘counterfeit’ and a ‘parallel’ product and the action had been unsuccessful. The third party company had therefore continued to trade.

When questioned about his actions on discovering what appeared to be a case of counterfeit pesticide on his farm participant #18 conceded that he consciously chose not to escalate the matter to the police or any other enforcement body. His rationale was simple; having talked to his agronomist in confidence he had concluded that if it proved to be a fake product there was no way of knowing what the personal consequences of “making a fuss” might be. Moreover he suggested that his fears, which included potential crop destruction, a loss of assurance scheme status and, at worst, his land being condemned for food crop production for some considerable period of time, were ones that would be shared by many if not all farmers. To use his own words in these circumstances “no-one is going to put their head above the parapet” and “I certainly don’t want to be the one carrying the can with no idea of the eventual outcome”.

## **5.2 Analysis of the quantitative data**

### **5.2.1 Awareness survey**

This element of the research was designed to ascertain the extent to which operational police officers and staff working in a police force with a significant rural area and farming population were cognisant of the UK counterfeit pesticide problem (research Q.7). To that end the survey compared police awareness to two other subject groups; professional users of pesticides and a group consisting of individuals with no professional interest in the problem. Analysis of the resulting data tested two hypotheses;

- That police officers and staff awareness of counterfeit pesticides would not be as good as those who work with pesticides in a professional capacity but would be better than the general public (control group);

- That of those police officers and staff who were aware of counterfeit pesticides their self-declared knowledge of the problem would not be as good as those who work with pesticides in a professional capacity but would be better than the general public (control group).

The first of these hypotheses was tested by way of Q.9 of the survey to be found at Appendix 3 which asked participants for a simple Yes/No response to the question: *Are you aware that pesticides made by legitimate manufacturers are sometimes illegally copied and sold?* The results, by participant group, are shown at Table 5.4.

**Table 5.4:** Response to survey question: *Are you aware that pesticides made by legitimate manufacturers are sometimes illegally copied and sold?* Results shown by % Yes/No for each subject group.

<b>Subject group</b>	<b>n=</b>	<b>No</b>	<b>Yes</b>
Control group	290	67.54	32.46
Police staff	115	62.28	31.72
Pesticide users	647	42.61	57.39

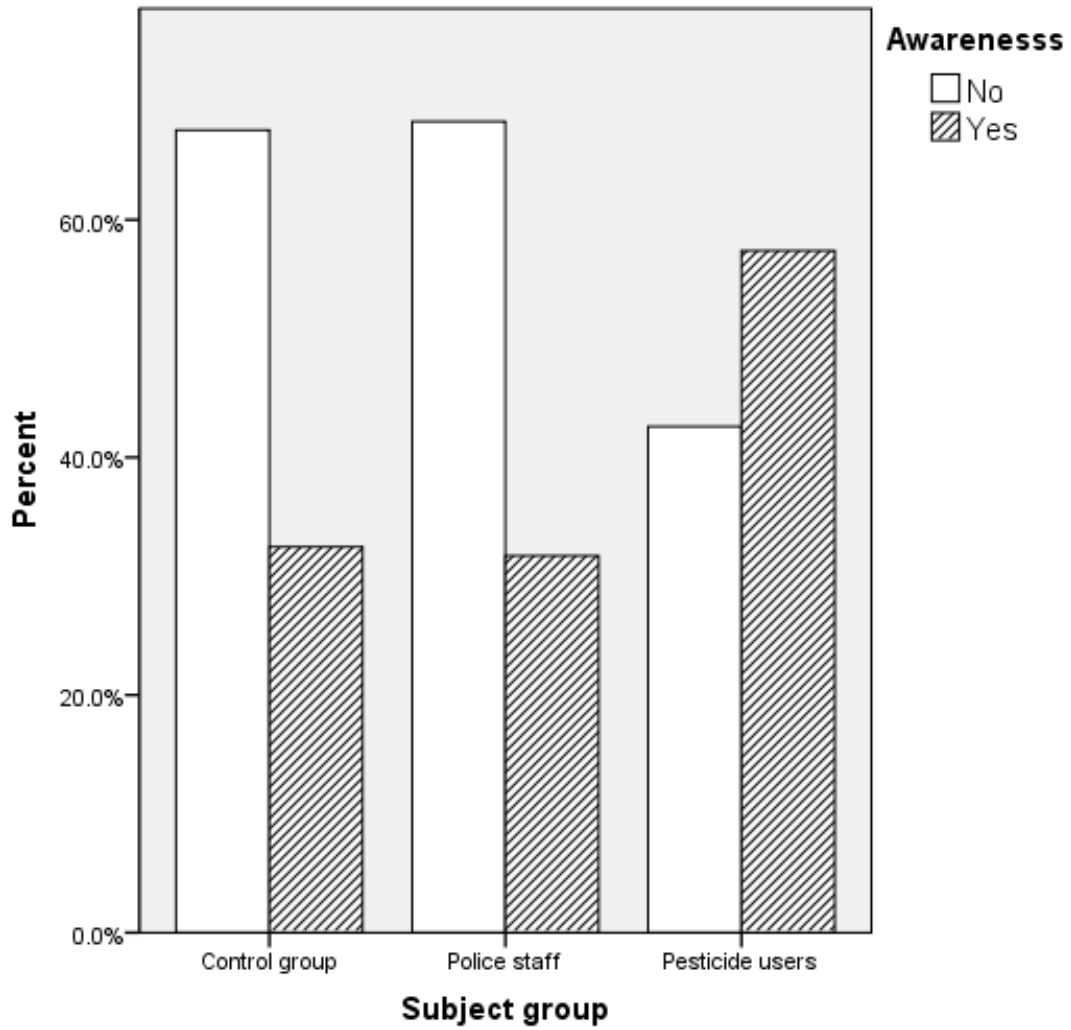
Using the method of analysis described in section 4.2.2 of the thesis the police officers and staff group was compared separately to the other two subject groups to test if they were identically distributed. A screen capture of the SPSS output for the Mann-Whitney tests (test rank and test statistics) for the two comparisons is given at Appendix 6. Comparing the police staff awareness to that of professional pesticide users at a

significance level of 0.05 as hypothesised there was a difference between these two groups (two sided Mann-Whitney u test,  $p < 0.05$ ). Referring to Table 5.4 this difference was in favour of the pesticide user group having the higher level of awareness. However, when comparing the police awareness to the control group, again at a significance level of 0.05, contrary to the hypothesis there was no difference (two sided Mann-Whitney u test,  $p > 0.05$ ).

The results of the survey demonstrated that in the sample area awareness of the counterfeit pesticide problem amongst police officers and staff was lower than that of professional pesticide users and in fact was no better than that of a control group representing the general public. These results are presented graphically in Figure 5.1 which clearly shows these results.

Turning to consider the self-declared knowledge amongst those who were aware of the counterfeit pesticide problem this was tested by way of Q.11 of the survey to be found at Appendix 3. This question asked participants: *How would you describe your personal knowledge of the threat posed to UK agriculture by counterfeit pesticides?* Participant response was constrained using a Likert response scale with the options: Poor or none, fair, good, or very good. The results, shown by participant group, are shown at Table 5.5.





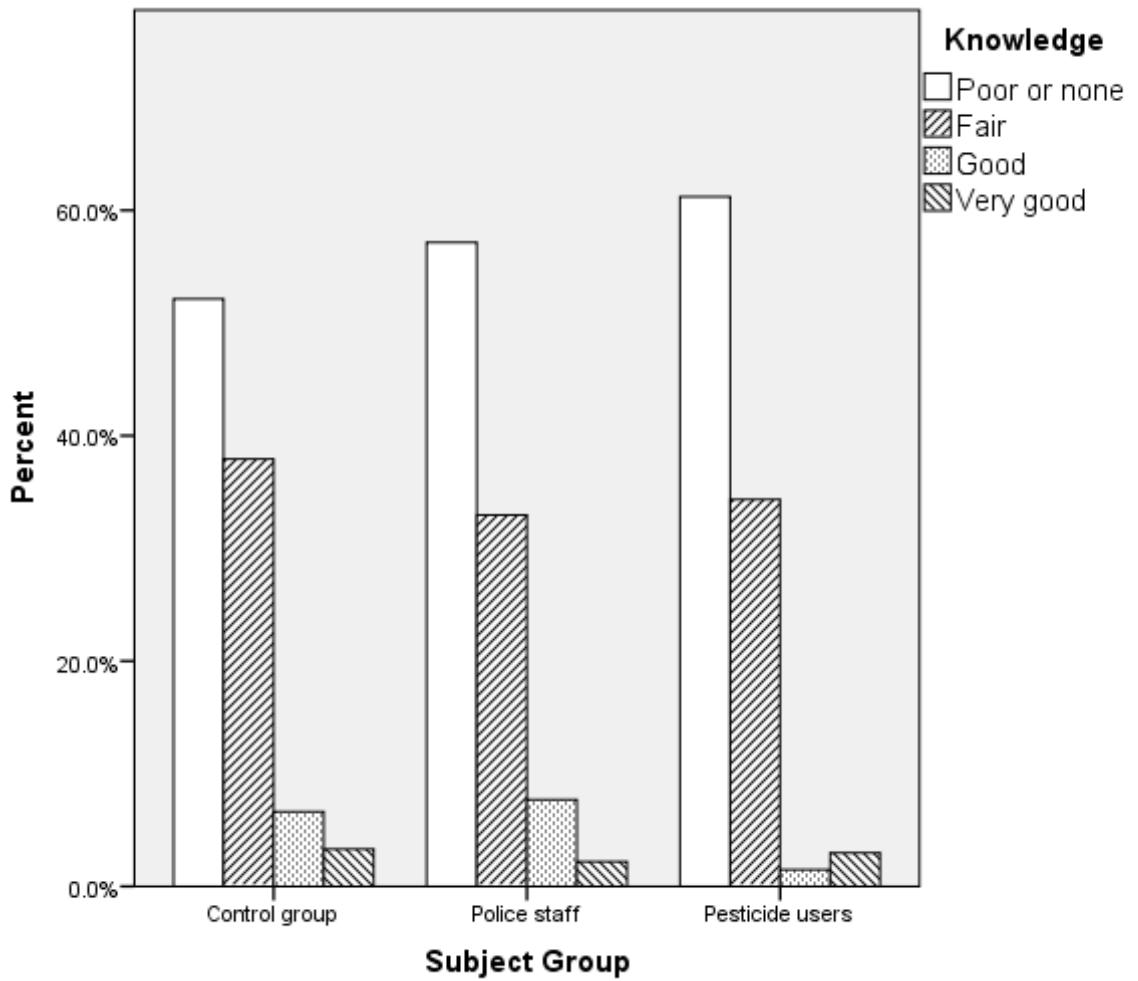
**Figure 5.1:** Response to survey question: *Are you aware that pesticides made by legitimate manufacturers are sometimes illegally copied and sold?* Graphical representation of results shown by % Yes/No for each subject group.

**Table 5.5:** Response to survey question: *How would you describe your personal knowledge of the threat posed to UK agriculture by counterfeit pesticides?* Results shown by % response for each Likert scale option by subject group.

<b>Subject group</b>	<b>n=</b>	<b>Poor/None</b>	<b>Fair</b>	<b>Good</b>	<b>Very good</b>
Control group	211	52.13	37.91	6.64	3.32
Police Staff	91	57.14	32.97	7.69	2.26
Pesticide users	67	61.19	34.33	1.49	2.99

Again the police staff group were compared separately to the other two subject groups to test if they were identically distributed. A screen capture of the SPSS output for the Mann-Whitney tests (test rank and test statistics) for the two comparisons is given at Appendix 6. Comparing the police staff awareness to that of the pesticide users group and the control group at a significance level of 0.05 contrary to the hypothesis there was no difference to either (two sided Mann-Whitney u test,  $p > 0.05$ ).

The results of the survey, which are well illustrated in graphical form at Figure 5.2, demonstrate that in the sample area the self-declared knowledge of the counterfeit pesticide problem, amongst police staff who had previously declared that they were aware of the problem, was the same as those who were aware of the problem in both the professional pesticide users group and the control group representing the general public. The true significance of this result only becomes apparent when considering at what level this homogeneity of awareness lies; the bias is firmly toward all those who were aware of the problem, including professional users of pesticides, declaring that their knowledge of the issue is poor or none.



**Figure 5.2:** Response to survey question: *How would you describe your personal knowledge of the threat posed to UK agriculture by counterfeit pesticides?* Graphical representation of results shown by % Poor/None, Fair, Good, Very Good for each subject group.

In summary then the results of the survey demonstrated that awareness of the UK counterfeit pesticide problem amongst police officers and staff is no better than the general public and, as importantly, despite industry campaigns and widespread media coverage well over half of all of those who are aware of the problem, including professional pesticide users, believe their knowledge of the problem to be poor or none.

### **5.2.2 Word cluster analysis**

Having considered by way of stakeholder interviews and FoIA requests whether the UK counterfeit pesticide problem is addressed at a strategic and policy level the word cluster analysis was designed to seek evidence of it being responded to at an operational level (research Q.6). To that end the content of 332 rural crime specific online newspaper articles published over a twelve month period were analysed.

As a precursor to any other analysis the content of these articles was examined for evidence of media coverage of the police responding to an incidence of counterfeit pesticide; none was found. Moving then to consider what was the predominant theme of these articles in terms of simple word frequency the words that occurred most often are shown in Table 5.6. The results were interesting in so much that they illustrate the predominance of theft as a subject in rural crime reporting. However, the data only became meaningful once a word cluster analysis had been carried out to produce the dendrogram given at Figure 5.3. This process grouped the words shown in Table 5.6 such that it reflected how closely they were associated with each other across the entire sample.

The value of this method of content analysis, as it was utilised in this study, lay in its capacity to reveal the structure and content of an 'average' rural crime article.

When considered alongside the articles themselves, which were used as a point of reference to aid understanding of how the various words were associated within the clusters, it gave a valuable insight into as to how rural crime was typically portrayed. More importantly given that what was being considered was overwhelmingly police generated content, it was deemed to be a de facto indication of the operational police rural crime focus. In the following synopsis of the articles extracts of the narrative part of those articles used to illustrate specific points are reproduced at Appendix 7.

In the context of newly appointed Police and Crime Commissioners in England and Wales, many of whom in forces with a substantial rural population had included the prioritisation of rural crime in their policy agenda, it is probably not surprising that a sustained strand of promised engagement between police and local rural communities was observed (see for example Appendix 7.1). However, whilst the headline intent was tackling 'rural crime' the analysis suggested that this maxim may be somewhat misleading. The police perception of what constitutes rural crime appeared to be constrained, for overwhelmingly dominant was theft, or more precisely theft from farms (see for example Appendix 7.2)<sup>77</sup>. Such offences were described as being on the increase, at least so far as reported incidence is concerned, and this was framed as being the outstanding rural crime problem. Whilst there was some limited variation in this pattern of reporting, notably seasonal articles that linked travelling offenders and suspicious activity to police initiatives to counter hare coursing (see for example Appendix 7.3), overall it was remarkably consistent in its property crime focus.

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<sup>77</sup> In the qualitative phase of the study the link between the strategic police focus on theft from farms and NFU Mutual insurance was noted. For the sake of completeness, and because three letter words were excluded by default, NFU was added as an included word in the analysis. It appeared regularly in the reporting but did not achieve the weighted percentage required for it to be included in the cluster analysis.

Closely associated with this was a parallel and equally consistent strand which emphasised the need for potential victims to engage with security and crime prevention measures to protect rural property. This narrative did not commit to the deployment of more police resources rather it promoted self-help activities. Foremost amongst these were Watch schemes, police sponsored initiatives the purpose of which was described as promoting vigilance amongst rural communities and stimulating communication with the police (see for example Appendix 7.4). It was the reporting of suspicious activity, and most notably suspicious 'outsiders', and the ability of the police to respond to this in the form of targeted operations and patrols, that was frequently described as being the key to tackling rural crime (see for example Appendix 7.5).

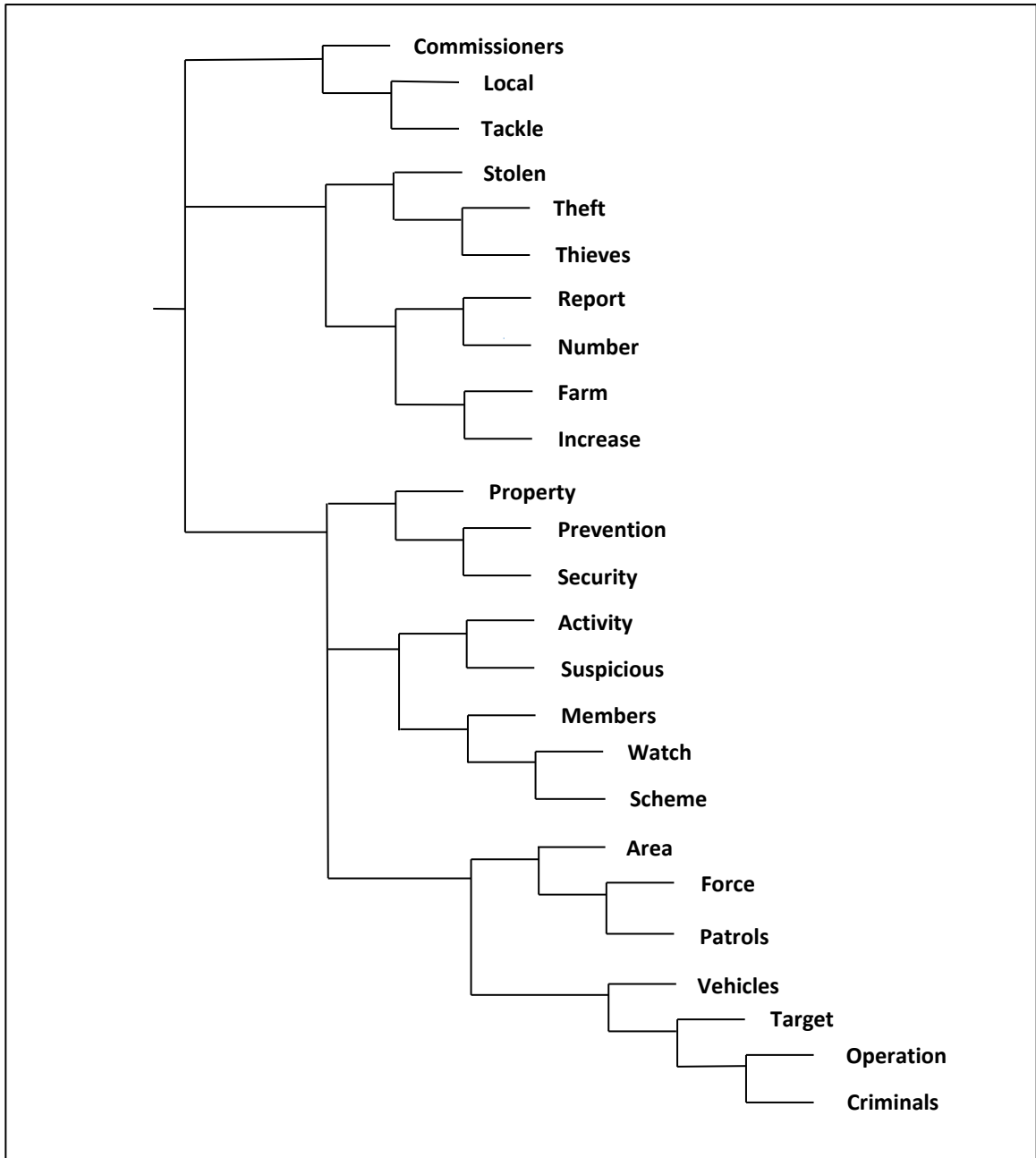
Whilst this may seem to be a rudimentary, arguably simplistic, measure of operational police focus this novel approach did produce clear data that lent itself to relatively simple interpretation. It would be presumptuous to take these results alone as being evidence of a bias in rural policing but in the context of this study it might reasonably be seen as indicative of the national focus of operational rural policing being on tackling theft, and more specifically theft from farms.

**Table 5.6:** Online local reporting of rural crime from May 2013 to April 2014:  
twenty-five most commonly occurring words ordered by weighted percentage.

<b>Word</b>	<b>Count</b>	<b>Weighted</b>	<b>Similar</b>
Theft	386	0.64	thefts
operations	355	0.59	operation,
Areas	350	350	area, areas'
criminals	293	0.48	criminal,
Report	289	0.48	reported,
vehicles	285	0.47	vehicle,
Watch	282	0.47	-
Locals	272	0.45	local, localities,
Target	263	0.43	targeted,
Force	261	0.43	forces, forces'
Tackle	249	0.41	tackled,
scheme	245	0.40	schemes,
Farms	237	0.39	farms', farming
commissioners	224	0.37	commissioner,
prevention	210	0.35	prevent,
members	200	0.33	member,
security	193	0.32	secure,
number	191	0.32	numbers
Activity	189	0.31	activities,
increase	187	0.31	increased,
Patrols	157	0.26	patrol,
property	155	0.26	properties
Stolen	153	0.25	-
suspicious	152	0.25	Suspiciously,
Thieves	150	0.25	thief, thieves',

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<sup>78</sup> Following the initial run of the cluster analysis it was apparent that certain words similar to the primary had been included but were not necessarily related. For example the word 'report' had the word 'reporter' included in its count. The analysis was therefore re-run with the non-related words excluded to give a more accurate result. The similar words given in the table were those that were both similar and used in the same context as the primary and were therefore not excluded.



**Figure 5.3:** Online local reporting of rural crime from May 2013 to April 2014: word frequency cluster analysis.



### 5.2.3 Quantitative Freedom of Information requests

To obtain quantitative data that may be indicative of counterfeit pesticide occurrence pattern or trend within the UK (research Q.2) Freedom of information Act (FoIA) requests were sent to those public authorities detailed in Table 4.3. Of the forty three police forces to which requests were sent thirty five responded, and of the nine Trading Standards department to which requests were sent eight responded. Both the Home Office (Border Force) and the Health and Safety Executive (CRD) also responded.

All participants, with the exception of the Health and Safety Executive (CRD), gave a nil return. That is to say that they had no record of their having dealt with a counterfeit pesticide incident over the given time period. Interestingly a large proportion of those police forces that responded, eight out of the thirty five (23%), declined to answer the questions posed. The narrative response provided by Gloucestershire Constabulary was typical, indicating that an exemption under the Act was claimed because:

“Section 12(1) – Fee Regulations states: Section 1(1) of the Act does not oblige a public authority to comply with a request for information if the authority estimates that the cost of complying with the request would exceed the appropriate limit”.

It would seem then that a significant number of forces do not have the capacity within their crime and incident recording systems to easily carry out free text searches to identify offending that does not reflect Home Office crime recording rules. Tellingly the Home Office themselves, on behalf of the Border Agency, indicated that whilst their

system did record the seizure of counterfeit items “there is no search criteria on the database to identify what the counterfeit item is” and they claimed the same exemption.

It was also interesting to note that several police forces, including Kent Police, Hertfordshire Constabulary, and West Yorkshire Police were of the opinion that this crime would be recorded by Trading Standards rather than themselves. However, all Trading Standards returns were nil, that is to say they had not recorded any incidence. Taking a slightly different approach Dorset Police suggested that this type of crime would be dealt with by the City of London police under the guise of either Action Fraud or the Police Intellectual Property Crime Unit (PIPCU). Both of these initiatives were discussed in the review of the literature in the context of there being a precedent for the police engaging with fraud consequential to intellectual property (IP) offences. Whilst a FoIA request was sent to the City of London Police as part of this quantitative strand of the study in light of the Dorset Police suggestion a repeat request was sent specifying that data was requested in relation to the enforcement activities of Action Fraud and/or PIPCU. Again a nil return was received, neither having any record of having dealt with any counterfeit pesticide incidents.

This left the Home Office (CRD) as the only response that indicated that they had dealt with counterfeit pesticide cases over the specified time period. The data they provided in response to the first question asked is shown at Table 5.7. The response suggested a relatively stable, and arguably rather modest, number of complaints in each of the data years. Year 2011 appeared to be anomalous, having twice as many incidents as the previous or following years. This prompted a supplementary request to CRD for any further data or information which might help to explain this pattern. Participant #24, a member of staff within the Compliance Branch, replied expressing a view that, given the relatively small number of recorded incidents for each year, it is not possible to say if there was any particular reason for the 2011 figure being higher.

Participant #24 further stated that there appeared to be no obvious trend. However, the apparently low occurrence rate may be misleading. The response also contained a narrative explanation which placed the data in context and went some considerable way to explaining the CRD position with regard to counterfeit pesticides. This also prompted further direct engagement between the author and CRD (participants #23 and #24) to clarify a number of interesting and potentially significant points. Whilst the narrative and subsequent exchange might not be strictly within the parameters of quantitative data they are presented here because they contextualise the incidence figures given in Table 5.7.

**Table 5.7:** Health and Safety Executive (CRD) response to FoIA question requesting data showing – *The number of separate incidents or suspected incidents involving counterfeit pesticides which were investigated by CRD in each of the calendar years from 2010-2014 inclusive.*

Year	Cases
2010	6
2011	12
2012	6
2013	7
2014	8

CRD do not routinely scrutinise imported plant protection products and for them to intercept an imported product which is counterfeit would be very unusual. Most of the cases they deal with are reactive, arising out of complaints by agrochemical companies

that the formulation of a parallel traded product they have identified is not consistent with its authorisation<sup>79</sup>. Occasionally they may receive a complaint about generic, 'me-too' products where the complainant has a legitimate business arrangement supplying the authorisation holder with an active substance but believes the active ingredient is being sourced (illegally) from elsewhere<sup>80</sup>. During the specified time period CRD did not encounter any products labelled or packaged in a way which purports them to be another company's branded product (a deceptive counterfeit in the classic sense).

The alleged formulation differences identified varied from product to product but generally did not relate to the active substance(s) rather they involved either impurities or co-formulants. Subtle differences in the impurity profile of a product may suggest a manufacturing process which was not consistent with that employed by the genuine authorisation holder. Alleged differences in co-formulants can involve qualitative or quantitative variations from the authorised formula.

Complainants usually base their referral to CRD on an initial analysis carried out in their own laboratory facilities. There is often somewhat of a delay before CRD receives the complaint meaning it is not always possible, due to the seasonal nature of the supply chain, to independently obtain samples and confirm (or otherwise) the complainants findings. As participant #23 suggested this, taken alongside the other constraining factors, meant that the disclosed data was not a fair reflection of the probable incidence of counterfeit pesticides in the UK market in any given year.

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<sup>79</sup> As the body that authorises pesticides to enter the market their primary enforcement concern is whether the product being investigated meets their authorised specification.

<sup>80</sup> A 'me-too' product is one introduced by a company after it has seen that other companies are successful with the same type of product. The suggestion here is that the manufacturer of the original product is also supplying the 'me-too' company.

The second part of the FoIA request to CRD requested that they disclose; *the total quantity (by weight or volume) of counterfeit or suspected counterfeit pesticide seized by CRD in each of the calendar years from 2010 – 2014 inclusive*. CRD gave a nil response to this question. As has been previously noted most of the cases CRD receive are reactive and arise from complaints from agrochemical companies. Generally CRD only take possession of a sample of the alleged counterfeit product. Moreover the powers that HSE, of which CRD is a division, hold to seize illegal plant protection products are only available to them under certain restricted circumstances and it is not a commonly employed enforcement tool.

It is clear that CRD are carrying out a very specific enforcement function within the market place; ensuring that pesticide formulation conforms to that which is registered. Their enforcement activities do not extend to proactively pursuing perpetrators, rather they provide an evidential means by which manufacturers of genuine product might take civil action against an alleged importer of counterfeit product. The data they provided is certainly a reflection of that referred to them but it cannot be considered to be in any way a reflection of any incidence trend. Nonetheless the supplementary narrative and engagement with CRD proved most useful in establishing that the physical characteristics of the seized illegal product is entirely compatible with the modus operandi for this crime described elsewhere in these study results.

## **6.0 Merging the data and revisiting the study objectives**

The third step in the convergent parallel mixed method required that the analysed data from the qualitative and quantitative strands of the research be merged before interpretation. One benefit of the chosen research design was that it gave an innate means by which this merger could be achieved. Each of the data gathering methods employed in the study was chosen with a view to answering a specific research question. At the same time these questions were framed, and the data collecting method applied, such that they were mutually supportive; each had the potential to contribute toward other study objectives. On completion of the data analysis it was therefore possible to consider each of the objectives in light of the data produced by all strands of the research. In doing so a fresh narrative emerged that described the UK counterfeit pesticide problem and the police response to it. The thesis continues by summarising that narrative, recognising where it is appropriate those instances where the data strands were mutually supportive.

### **6.1 First study objective – looking for evidence of counterfeit pesticides in the UK marketplace**

The first study objective was to find if there is evidence of counterfeit pesticides being prevalent in the UK agricultural marketplace. By and large the research broadly supported the narrative to be found in the literature. It confirmed that the problem was 'real' and characterised by the suspected modus operandi, and it reinforced the likely economic, environmental, and potential human costs of this crime. However, the data did not entirely endorse the popular narrative for there were specific points which were contradicted and other factors that had simply not been recognised. When considering the likely incidence of counterfeit products in the UK marketplace the literature, notably

in the form of industry representative body reports, suggested that it may amount to 2% of the total market. However, the data indicates that this figure may be very much higher, and possibly in excess of 10%. Moreover the same literature source implied that some 75% of such products had their origin in China. The research indicates that this may be a significant underestimate and that the true figure may be as high as 95%. It is interesting that the literature also contained evidence of the pesticide regulatory authority being of the opinion that counterfeit pesticides were not at all common in the UK. The results of this research may go some way to explaining why they believe this to be the case for it might be presumed that a lack of proactive engagement, and a seeming lack of confidence on the part of manufacturers in this authority's capacity to pursue offenders, would leave them somewhat isolated from the problem. It is somewhat ironic then that where industry representative body reports claim that they are in close contact and collaboration with enforcement agencies, and there is evidence of this being the case in relation to specific incidents occurring in mainland Europe, there was nothing in the data to suggest that this was generally true for the UK at least so far as anti-counterfeiting initiatives are concerned. Nonetheless, and despite contradictions such as those exemplified above, it would still be fair to say that in broad terms the industry narrative and associated media discourse is still a reasonable reflection of the UK counterfeit pesticide problem. However, the results of the research also show that it is a far from complete picture.

The predominant view amongst interview participants was that this is a crime that is intrinsically linked to the trade in parallel traded products, albeit there was a previously undocumented dissenting view that suggested that whilst this is the case it is a problem that was largely of legitimate manufacturers own making. Product analysis, carried out by the responsible enforcement agency and derived from Quantitative FoIA data, supported the link citing incidence of formulation irregularity in

seized parallel products. What was not clear from this data, or indeed from elsewhere in the study, was the extent to which these were 'technical' breaches of the regulations consequential to manufacturer variations in formulation or whether these were 'genuine' counterfeits. That said there was a considerable amount of other evidence, notably from interviews with both mainstream manufacturers and regulatory enforcement stakeholders, to be confident that there are products entering the legitimate UK market which are not identical to the registered UK formulation and which do not have their origins with legitimate manufacturers. These were described as being near perfect clones, to the extent that in practice they are able to bypass what some considered to be a weak regulatory framework which allowed illicit parallel traders to constantly stay one step ahead of the inspectorate.

In direct contradiction to one expert opinion noted in the literature review stakeholders recognised a persistent link between this trade and what they considered to be, and what the definition given in the literature would confirm suggest certainly is, organised crime. In this case 'organised' was most certainly the operative word for it was suggested that those who are largely responsible carry out this trade do so under the pretext of seemingly legitimate enterprises operating in the rural environment. Whilst China was recognised as the primary source of illicit product, and abuse of parallel trading regulations facilitated their distribution, what was less clear was the means by which OCG counterfeiters facilitate their reaching the UK marketplace (the transnational element of the crime). Unfortunately, and as was demonstrated by Quantitative FoIA data, Border Control data collection methods do not allow for the differentiation of counterfeit pesticides from other seized counterfeit products. Assuming of course this is a genuine inability to isolate the relevant data then it negates a potentially useful means of identifying predominant points of illicit product entry. In the circumstances the study turned to the experience of stakeholders who



recognised major Northern European ports as being the primary point of entry into the European Union, with free movement of goods rules facilitating the onward movement into the UK. However, what was much less clear was the extent to which what was variously described as a porous Eastern EU boundary facilitates the overland entry of such goods from a part of the world where the counterfeit pesticide problem is more firmly entrenched. Certainly the experience of one farmer, described in the Oral History interview, suggested that at least some of these products are transiting through Russia or its environs. Interestingly then, and despite the apparent OCG link, Qualitative FoIA data suggested that none of the respondent police forces had seen fit to include it in their rural crime strategies, even where those strategies made specific mention of organised criminality in the rural setting.

Identifying the extent to which OCG groups have penetrated the UK pesticide market remains highly problematic. Indeed in the narrative explanation of CRD incidence data CRD themselves acknowledged that it was not a fair reflection of incidence rate. Despite the apparent weakness of this data the comments of manufacturing company stakeholders suggests that a relatively modest proportion of the UK market is lost to illicit products. However, there was an entirely contrary and very robust non-manufacturing view that the UK problem has been grossly underestimated and that it more closely resembles other parts of Europe. It was interesting then that the case study farmer victim had acquired a counterfeit product through a buying group, prompting an obvious comparison with the wider European problem where stakeholder evidence suggests the primary route for the distribution of illicit product is through such cooperative arrangements.

Where there was more of a consensus was in recognising that an accurate estimate is, and will probably remain, elusive so long as there is an absence of a robust means of monitoring the marketplace for incidence or recognising the indicators

of a potential counterfeit problem. Stakeholders saw the current monitoring system, such as it is, as being overly focused on 'approval to sell' rather than defending legitimate manufacturers and consumers from unapproved products entering the marketplace. Data derived from a Quantitative FoIA request to the regulatory authority did little to negate this view, suggesting that proactive regulatory agency activity in this area is negligible. As importantly the Oral History suggested a fear driven reluctance on the part of farmers to report to the authorities when they suspect that they have been the victim of a counterfeit product. This being the case it naturally followed that no investigation would be carried out even when a problem was recognised on farm. It is a pattern reinforced when enforcement agencies were asked for incidence data. With one exception, CRD, these requests all produced a nil return.

The consequences of this unknown quantity of counterfeit product reaching the marketplace is equally difficult to gauge. Nonetheless in the absence of any reliable measure of an economic cost to manufacturers and farmer users, which is probably self-evident if difficult to quantify, the study found good evidence of both potential human and actual environmental impact. Sample evidence proffered in interview by a stakeholder with responsibility for regulatory enforcement confirmed that seized product contained carcinogenic material and that the persistency of this carcinogen in the food chain was not appreciated. In addition the Oral History contained good evidence of damage caused to trees and other vegetation caused by what was almost certainly an illicit parallel traded product. These two cases certainly add weight to the argument that these products are of illicit origin rather than the result of legitimate manufacturer formulation variation. However, determining the potential threat to human health and the environment from such products remains difficult because farmer victims currently choose not to report incidence.

Much of the research data discussed thus far in the context of the first study objective has provided evidence to support and expand upon the previously unsubstantiated narrative that appeared in industry and media accounts of the UK counterfeit pesticide problem. Whilst in itself this was undoubtedly a useful contribution to the subject, and showed that the problem is similar to the wider European problem in many respects, this was not the full extent of the findings. A number of previously unrecognised characteristics of this crime also emerged from the data which suggest that in other respects it may be a markedly different problem in the UK context.

By and large the EU trade in parallel products of all types relies on price differentials across EU member states to provide opportunity for a trader to make a profit. However, whilst accepting that price differentials may still have influence, in direct contradiction to opinion identified in the literature review the evidence of this study suggests that there has been a general harmonisation of EU pesticide prices this to the extent that product shortfall may now be the predominant market driver. Unanticipated demand for a product that the nature of crop production necessitates must be acquired and used within a tight timeframe tends to distort both demand and consumer perception of the risk of acquiring an 'alternative' product. Moreover the unusual if not unique relationship of trust between farmer, agronomist, and agricultural merchant may exacerbate the problem by virtue of that risk not necessarily being fully appreciated by the end user. The Oral History data evidences this very well in that these were exactly the circumstances that prompted the case study farmer victim to step outside of their normal buying pattern. It is a threat that is seemingly ever present, not least because illicit traders have a foothold in the UK pesticide market by virtue of there being an underlying and persistent trade in illicit products to an amenity market where, unlike the core agricultural industry, there is no quality imperative reinforced by crop and food assurance schemes. The problem therefore persists in the amenity

sector, even when the agricultural demand for pesticides is being met from legitimate sources. The companies and individuals involved in this illicit trade are well placed to capitalise on unexpected demand in the agricultural sector, using established links to acquire unapproved product from a Chinese market with over capacity when a rationalised European manufacturing sector is unable to meet demand.

In terms of addressing these issues crucially there is no evidence of a unified or coordinated industry or enforcement effort to address the UK counterfeit pesticide problem. Indeed Quantitative FoIA data suggests considerable uncertainty as to which agency is responsible for response. Any industry willingness to consolidate knowledge or intelligence to prompt an enforcement agency response is stifled by the fear of breaching fair trading regulation. Moreover, and as was demonstrated by the Awareness Survey, any attempt to gather primary evidence by agencies, that is to say farmer or sprayer operator victim derived intelligence, is bound to be difficult when knowledge of the problem is woeful even amongst professional users of pesticides. It is therefore unsurprising that the industry, and associated stakeholders, see little or no evidence of enforcement agency activity in relation to the problem; the police do not perceive this to be a rural crime, CRD do not regularly scrutinise imported product or proactively seek out breaches of regulation, and this crime is not a Trading Standards priority or even subject of intelligence gathering. It is likely that Border Force are similarly disengaged, having no means of isolating incidence of seizure.

In terms the first study objective whilst these findings perhaps prompt as many questions as they do provide answers what can now be said with reasonable certainty is that counterfeit pesticides are indeed prevalent in the UK marketplace. The second objective is therefore relevant.

## **6.2 Second study objective – considering whether this crime is being addressed by the police**

Given this seeming lack of engagement by any other agency the second study objective considered whether this was a crime that was being addressed by the police. In simple terms the data suggests that it is not, this despite the evidence of stakeholder interviews that this is demonstrably a crime with OCG links and an industry victim perception that it should be a police matter. That is not to say that police forces have singularly failed to recognise OCG activity in the rural setting, police interview subjects describing how their force had acknowledged a link between hare coursing and OCG activity. Qualitative FoIA data showed that some other forces have forged that same link, however, apparently none had appreciated OCG association with counterfeit pesticides. Quantitative FoIA data suggested that, at least amongst those forces that were able to access their crime recording systems in any meaningful fashion, there was not a single record of the police taking action against a counterfeit pesticide trader. Moreover this lack of legal engagement was reflected in poor operational awareness. The awareness survey showed that appreciation of this problem amongst those working within a police force with a significant area of farmed land was no better than the general public, and amongst the relatively small number that were aware of this crime their knowledge of the subject was generally poor or none.

## **6.3 Third study objective – looking at what lies behind the lack of police engagement**

The third study objective looked at what might lie behind this lack of police engagement. Crucial to understanding this is the police perception of what constitutes rural crime which is very narrow at a strategic and policy setting level. Admittedly 'rural

crime' is difficult to define, but within the sample police force there had been what amounted to an opt-out from addressing this question. Rather than seek a police-centric definition which might include a diversity of offending the force had chosen to follow the focus of an insurance company with a significant interest in farm business, and to benchmark success in tackling rural crime against their published data. This was acknowledged as having the result of constraining the definition of 'rural crime' to simply meaning 'theft from farms', with an open acknowledgement that "we end up with crimes being committed in an agricultural environment...the nicking of tractors and agricultural machinery". Qualitative FoIA data showed that this property bias is recognisable across the majority of forces that have a specific rural crime policy. Overwhelmingly 'rural crime' is intrinsically associated with property crime and in the majority of cases this is further refined, as it was in the sample police force, to mean theft from farms. Moreover the Word Cluster Analysis reinforced this finding, showing that at an operational level this bias is equally recognisable, with theft from farm being dominant.

#### **6.4 Summary of the merged data**

Collectively considering the data generated for all of the research objectives what is observed is a UK crime issue that, in many of its key characteristics, has much in common with the problem as it is observed across Europe and as it is described in the literature. For example it has a strong association with the trade in parallel products and it is linked to the activities of organised crime groups. However, in some key respects it is markedly different, notably in that its occurrence in the market place is largely dependent upon the availability of legitimate product rather than price differentials, and that there is an underlying trade in illicit product that lies outside of the core agricultural industry. This crime problem is currently not addressed by the police

to any meaningful extent despite their having recognised the significance of OCG activity in the rural setting. This lack of engagement may be due to an overt focus on theft from farms as the benchmark rural crime, seemingly at the expense of less obvious rural offending such as the sale of counterfeit pesticides.

## **7.0 An interpretation of the results; recognising an underlying market dynamic**

The fourth and final step in the convergent parallel mixed method requires that, having merged the results, the data be interpreted. Creswell and Clark (2011) offer various means by which this might be achieved including, as is the case here, a discussion of the ways that the results produce a more complete understanding of the research problem. Anticipating that such a discussion would benefit from the influence of an established explanatory theory, and given that the review of the literature failed to identify an obvious candidate, it was deemed appropriate to return to the literature in light of the research findings. This amounted to a supplementary review of the literature which may be found at Appendix 8.

An appropriate explanatory model was identified in Bernard Harcourt's criticism of the growing reliance on predictive methods, actuarialism, in criminal justice practice (Harcourt, 2006). Harcourt's assertion that such methods are distorting the understanding of criminal justice priorities may help to explain the police response, or rather lack thereof, to the UK counterfeit pesticide problem. This model is therefore used as an aid to interpreting this particular element of the merged research results.

From the outset this study has had one overarching concern, that being to determine if counterfeit pesticides pose a substantive threat to the UK agricultural industry. A review of the literature sought evidence of this question having been previously addressed. It would be fair to say that it had, at least in so far as there had been a significant amount of media and industry discussion of the subject. The literature recognised China as being the primary source of counterfeit goods, pesticides included, that the trade is dominated by the activities of OCGs, and that the counterfeit pesticide problem is at its most serious at the Eastern periphery of Europe. The literature also repeated a consistent, if evidentially lacking, message; that it is the abuse of parallel trading rules that underpins the UK counterfeit pesticide problem.



These characteristics of the problem were reiterated in the research, however, whilst these are important features collectively they amount to what this discussion would argue is the most important feature of the literature; whilst it captures the *mechanics* of the crime it fails to appreciate the *dynamics* of the problem. Crucially it is the dynamic that makes the mechanics of the crime a worthwhile undertaking for the OCG counterfeiter. It is therefore suggested that where this study makes a substantial contribution to the subject is that it recognises and describes elements of this dynamic, and specifically three distinct but interacting sources of influence which significantly contribute toward shaping the UK counterfeit pesticide problem. These are;

- The diverse nature of the UK pesticide marketplace;
- The operating practices of the legitimate manufacturing industry;
- The narrow focus of rural policing.

### **7.1 The diverse nature of the UK pesticide market**

This study set out to consider a specific crime and how it impacts upon one particular industry sector. Unwittingly this initially resulted in something of an isolationist approach to the problem, considering only how the crime manifests itself in the agricultural context whilst failing to appreciate the relevance of the diverse nature of the UK pesticide marketplace. In fairness this narrow perspective, that is to say one that fails to recognise that the agricultural sector does not exist or operate in isolation, was also typical of the literature. This may go some way toward explaining its inherent weakness.

The use of pesticides in the UK is far from limited to farmers and growers. It is in this sense, rather than in the range of products used, that the UK pesticide market is described here as diverse. Crucially with this diversity comes opportunity for OCG

counterfeiters. It was the blended approach to the subject, and the use of a snowball sampling method to identify a broad range of stakeholder opinion and experience, that allowed a baseline level of counterfeit pesticide activity residing outside of the agricultural sector to be recognised and described. The seemingly unpoliced amenity sector market for pesticides is sufficiently large and has sufficient value for OCGs to maintain a constant and active counterfeiting presence. Moreover the relatively disparate nature of pesticide supply into the sector means that illicit product entering the market is unlikely to be recognised let alone challenged. The size of this market is a matter of speculation. Nonetheless the possibility that the conservative end of the overall counterfeit pesticide problem estimate, at some 2% of the market, may be a reflection of 'business as usual' OCG activity within the amenity sector cannot be dismissed. Regardless of the size of this underlying problem the probable significance of this baseline counterfeiting activity only becomes clear when considered in the context of the way that the counterfeiting problem manifests itself in the agricultural sector which is very different.

At this point in the discussion it is worth considering the experience of the case study participant in the study, a farmer victim of a counterfeit pesticide. Climatic conditions had resulted in an unusually large amount of a particular spring planted crop being grown and there was a shortage of a particular herbicide associated with that crop. Because the legitimate pesticide manufacturing industry could not respond quickly farmer and growers were forced to consider an alternative source. Whilst in normal circumstances many would be overtly resistant to buying anything other than branded product from a trusted source because of the imperative of acquiring and using a product within a very narrow timeframe a product acquired through the parallel market might have seemed a relatively 'safe' alternative. Were the legitimate parallel trade able to meet such a demand spike there would probably be little of interest to the

counterfeiter. However, the results of the study would suggest that this is not the case, for it would be unusual for such a shortfall of a particular product in the UK to coincide with a significant over-supply in another EU country. It is at this point then the two separate markets converge and the significance of 'baseline' activity becomes apparent; there is an established illicit trade centred on the amenity market that is well placed to step in and take advantage of any difference between demand and the availability of legitimate parallel traded product in the agricultural market.

The case study demonstrates very well how an experienced farmer and user of pesticides can find him or herself the victim of a counterfeit product. Moreover participant #18 could not conceivably have been alone in this situation, indeed a near neighbour had also purchased the same illicit product with the same environmentally damaging result, and this incident further illustrates very well how an occasional market for counterfeit pesticides can evolve very rapidly allowing comparatively large volumes of illegal product to enter the market over a relatively short timeframe. In the circumstances described, where market demand for a product in short supply is seemingly sated despite there being insufficient legitimate product, it seems likely that this is consequential to the activity of counterfeiting OCGs; that is to say a criminal organisations that have both links to highly responsive manufacturing facilities in the Far East and established and seemingly legitimate access to the UK pesticide market. Such groups are able to respond to periods of unusually high product demand and meet the shortfall with unapproved products.

If the extent to which this happens is a matter of speculation it is worth considering that if the underlying market for counterfeit pesticides explains the 2% end of the estimate range then availability driven spikes within the agricultural sector may equally well explain the 10% or more estimates that some believe to be nearer the true extent of the market lost to counterfeit goods. Paradoxically then both occurrence

estimates may be correct; it depends on where, and when, you happen to look. In periods of 'normal' activity there may be an underlying level of activity that, in practice, is so low that it fails to attract significant enforcement attention. However, when a spike in demand occurs the proportion of the market lost to the counterfeiter may climb rapidly and, most significantly, dissipate just as quickly. Given what was learnt in the study about the time lag between an emerging spike being recognised and product being analysed by a CRD laboratory it is hardly surprising that prosecutions are highly unusual; the problem, and the evidence, has essentially disappeared - a problem compounded by a reluctance on the part of farmer victims, as was observed in the case study, to report an incidence as soon as it is suspected.

This pattern of incidence is a credible explanation for the wide ranging occurrence estimates observed both in the literature review and the research results. Moreover it reflects the typical OCG business model that was discussed at the very outset of this study; an ability to recognise an illicit trading opportunity which can be quickly exploited at a profit and with a low risk of being caught or prosecuted. It is the low risk characteristic that this discussion will now turn to consider, for it is only in understanding this side of the equation that the true threat that counterfeit pesticides present to the UK agricultural industry can be truly appreciated.

## **7.2 The anti-counterfeiting activities of the legitimate manufacturing industry**

In the same way that it has been demonstrated that the creation of opportunity may be consequential to the diverse profile of the UK pesticide industry the seemingly benign trading environment for the counterfeiter is likely to be consequential to two further key influences, the first of these being the anti-counterfeiting activities of the legitimate manufacturing industry. Industry reports and associated media articles

invariably describe the trade in parallel products as being at the heart of the UK counterfeit pesticide problem, and again the experience of the case study subject confirms and illustrates this. The same narrative was documented in the in-depth interviews, particularly from those speaking from a manufacturing industry standpoint. It is a narrative that may sound familiar to those who recognise the work of the sociologist Stanley Cohen. Albeit his original study exemplified a somewhat different set of circumstances Cohen's description of the creation 'folk devils' has a certain resonance with the pesticide industry portrayal of those who trade in parallel products<sup>81</sup>. This was certainly seen in the case study where the manufacturer of the genuine product labelled the 'parallel trader', rather than an individual, as being deviant. As was suggested by an informed study participant with personal experience of the relationship between parallel traders and mainstream pesticide manufacturers this may serve a greater purpose than simply highlighting a potential source of illegality. Nonetheless the collective industry might argue that casting the trade in parallel products in this light is entirely reasonable; there is little to suggest that illicit product reaching the UK market does so in circumstances other than through an abuse of parallel trading rules. However, the industry response to the problem also reflects this bias for it overwhelmingly focuses on the trade in parallel products, primarily in the lobbying of legislators to change the rules to further restrict this mode of trading.

No doubt there is scope to make the market less benign for counterfeiters who, under current rules, are able to trade a deceptive counterfeit that does not need to physically resemble the product it purports to be. This is a most unusual, if not a

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<sup>81</sup> The concept of the 'folk devil' is most closely associated with Cohen's (1973) work which described confrontations between Mods and Rockers at an English holiday resort. Cohen describe the important role played by the media in the distortion of events which may produce an extreme societal reaction to the stigmatized group(s).

unique, crime opportunity. In the context of the circumstances previously described, where any resistance to alternative products on the part of a conservative end user market is lowered by an imperative to acquire and use a specific pesticide in a short time frame, this presents a significant additional risk. Without understanding the mechanism by which pesticide authorisation and the associated unique reference system works an end user would have no reason to be suspicious when a product delivered bears no resemblance to the 'same' one he or she has previously used. This lowers the risk to the perpetrator of being caught, and no doubt makes the illicit pesticide market an attractive proposition for the criminal. Removing the ability to repackage product would probably make it less so, however, it may not be the panacea that the industry focus implies for it overlooks the entrepreneurial nature of the OCG perpetrators. Provided the risk of arrest and prosecution continues to be low it seems unlikely that a regulatory change would encourage the counterfeiter to do anything other than adapt. Reiterating what was suggested at the beginning of this discussion it seems then that the default industry response is to address the mechanics whilst ignoring the dynamics of the problem. Regulatory change does little to raise the risk to the counterfeiter of trading in illicit pesticides besides the prospect of a more punitive fine, which of course is irrelevant if the likelihood of being arrested and successfully prosecuted remains low. It is therefore a response that is unlikely to have the desired effect unless it is pursued with an associated strategy to simultaneously raise the risk to the counterfeiter. Most importantly this research suggests that the industry does have the means at his disposal to do just that, but it is not utilised or perhaps even appreciated. The pesticide industry is failing to capitalise on what may well prove to be its most valuable weapon in combatting the counterfeiter – the collective intelligence it holds.

Throughout the research phase of this study it was manifestly clear that the companies and organisations that participated held a great deal of collective knowledge not only about the individuals and illicit groups that are actively involved in the importing and distribution of counterfeit pesticides in the UK but also of patterns of incidence. However, what was also plain was that this knowledge is relatively thinly distributed and that it is held in what can only be described as corporate silos. Two reasons might be suggested for this phenomena, the first already having been recognised in the literature review; a concern that any acknowledgement outside of the victim company of a counterfeit incident might cause damage to the image of a valuable product brand. The fear is genuine and readily understood for any public acknowledgment that a particular pesticide is being targeted by counterfeiters will create a consumer perception that this is a 'risky' product and may prompt a switch to a competitor's alternative. In a highly competitive market it would be perfectly understandable that a victim company would not wish to expose such a problem to public gaze. The second reason is less obvious; a widespread unwillingness to share information for fear of falling foul of what the industry widely refers to as 'anti-trust rules' but is perhaps more properly described as competition law.

The constraints of legislation that is designed to prohibit practices that restrict free trade and to prevent a company abusing a market by virtue of its dominant position was a mantra that manufacturing based study participants universally espoused as a reason for not having collaborated to share intelligence concerning the counterfeit pesticide market. Again this is an understandable position for the penalties for falling foul of the legislation are significant and corporate legal departments are highly sensitive to the possibility of engaging in any collaborative process that might be seen as indicative of cartel like activity. Moreover, given that this is a highly competitive market, it would be surprising if there was not a degree of reticence on the part of

individual companies to make their own knowledge and intelligence available for fear it may be used for commercial advantage by others. However, there was indication from a number of industry experts who believed that anti-trust fears are over-played and that creative but perfectly legal means of sharing information for the common good have not been properly explored. It was interesting that this should come from a participant with considerable experience of the wider European problem who had been involved in collaborative initiatives which utilised a third party with intelligence analysis expertise to facilitate information sharing. As was noted in the research results this consolidated intelligence was then used to considerable effect to support anti-counterfeiting enforcement activity, most notably in Poland.

Whilst it was widely acknowledged by participants that more needed to be done by the industry to engage with enforcement agencies there was little evidence to suggest that any progress was being made to this end. Whilst there was evidence of engagement with CRD, specifically in relation to the testing of alleged illegal product and addressing the technical offences associated with placing unauthorised products onto the market, this engagement did not extend to other agencies. This may, at least in part, be the consequence of a lack of appreciation on the part of manufacturers of the demarcation of investigation and prosecution responsibilities across agencies (a feature of the complex mix of offences associated with this crime that was discussed in the introduction to this study). However, it is equally likely that it is because the information is not held in a form where it can be readily 'pushed' to enforcement agencies to encourage them to take action. Of course the opposite side to this particular coin is that, for exactly the same reason, there did not seem to be any 'pull' from enforcement agencies for intelligence, perhaps indicative of a widespread enforcement failure to appreciate the OCG link to counterfeit pesticides. This failure to engage may also have been aggravated by a lack of appreciation as to what would be



an appropriate level for engagement with enforcement agencies. This was typified by a participant who, when discussing the lack of Trading Standards engagement, described them as being used to dealing with wellies with holes in them. Of course this singularly fails to recognise that this is an enforcement body with a substantial intelligence gathering capacity besides its front line activities, and one with established links to other agencies who invariably have a similar intelligence gathering function. It may well be that victim companies, or for that matter end user farmers, interpret a lack of local front-line interest on the part of enforcement agencies as a disinterest in the problem when in fact it may be more indicative of engagement being at the wrong level within the overall enforcement network. This seeming absence of local enforcement engagement with the problem, and the need to reconsider the level of contact between victim and agency, is epitomised by the police response to counterfeit pesticides. The results of the study indicate that it would be unfair to entirely blame the pesticide industry for a lack of collaboration when the strategic and operational focus of local rural policing is so narrow that police forces would be unlikely to lend an enthusiastic ear to information concerning counterfeit pesticide activity even if it were offered.

### **7.3 The narrow focus of rural policing**

The results of the study suggest that the narrow focus of rural policing is the consequence of a strong actuarial influence and that the consequence of this is that some types of rural offending, the selling of counterfeit pesticides included, are essentially excluded. The priorities and concerns of the insurance industry have, by virtue of their inherent measurability, also become the priorities and concerns of those policing in the rural environment. The research data shows this influence very clearly, both in the setting of rural policing policy/strategy and when this is put into practice. Within the sample police force there was an open acknowledgement that there already

was, and would be an increasing tendency toward, aligning measures of rural policing success to NFU Mutual rural crime data which, crucially, does not include incidence of counterfeit pesticide being sold to farmers. Moreover more generally across those forces with a significant rural policing responsibility the FOIA request data and the word frequency analysis showed a very definite emphasis on the management of theft from farms over and above any other form of rural offending. This characteristic has not been adequately described in the literature and yet it may well be the defining feature of contemporary rural policing, at least in terms of its response to emerging technical crime the subject of this study included. It is at this point then that this discussion turns to the theorising of Bernard Harcourt to consider what the consequences of this tendency may be.

Harcourt's paradigm would presume that those criminals who are largely responsible for stealing from farms are not the same ones who are behind the counterfeit pesticide problem. Whilst it is perfectly possible, and indeed almost certainly the case, that both types of offending are underpinned by OCG activity the results of the research would suggest that they are unlikely to be the same groups. As has already been noted both in the results and in this discussion the trade in illicit pesticides is concentrated on a relatively small group of highly specialised criminals. It seems unlikely then that the ostensibly legitimate companies under the guise of which they operate would be sufficiently diverse to also be involved in stealing high value plant and machinery.

The paradigm further presumes that there is a difference in the relative elasticity of offending between these two groups; that is to say that one group is relatively less responsive to policing crime reduction initiatives than the other. In terms of the responsiveness of these particular groups data published by NFU Mutual themselves would suggest that the response of the first group, those that steal from farms, to the

sustained police focus on their activities is not what might be expected. The NFU Rural Crime Survey (NFU Mutual, 2015) indicates that theft of some items, notably machinery and quad bikes, has remained static over the preceding twelve month period whilst other theft, including tractors and trailers, has increased. It seems then that this group, at least on the evidence provided by NFU Mutual, have a relatively low elasticity of offending.

Of course determining the relative elasticity, that is to say comparing this first group to those responsible for the UK counterfeit pesticide problem, is not straightforward. As has been discussed at length throughout this study reliable quantitative data on pesticide counterfeiting activity is illusory. Nonetheless this discussion may make some reasonable assumptions based on what was found both in the literature review and the results of the research. The literature suggests that contemporary OCGs are entrepreneurial in nature and quick to recognise and respond to a profit making opportunity if they can do so at low risk of being caught. Moreover, and as has already been discussed in this review, they are likely to be doing so in the UK pesticide market particularly when there are product shortfalls. This would suggest a relatively high elasticity at least when compared to the first group (those upon whom the contemporary rural policing is focused). The implication of the relative difference in the elasticity of offending between these two groups of criminals is relatively simple but of great consequence; those that steal from farms have not been deterred by targeted police activity but at the same time those that deal in counterfeit pesticides have recognised the opportunity presented as a consequence of the police rural crime focus being other than on themselves. Harcourt's paradigm would imply that the predominance of theft from farms in rural policing policy and practice may, at the very least, have unduly exposed the UK farming industry to the threat posed by counterfeit

pesticides and may, given that this almost certainly not the only rural crime that would be overlooked, have led to an overall increase in rural crime.

Harcourt's paradigm is undoubtedly useful in this context, to the extent that even though it presumes that it is two entirely separate crime groups that are responsible for stealing from farms and selling counterfeit pesticides it could be argued that, in the circumstances being considered here, this is not an imperative. Whilst it has not been proposed as an alternative theory in the context of entrepreneurial OCGs it could be argued that any crime group engaged in diverse illegal activities are, to all intents and purposes, operating as multiple entities. That is to say that an OCG could, at one at the same time, be both elastic and inelastic. For example in this particular set of circumstances if it happened to be the same crime group stealing high value farm machinery and dealing in counterfeit pesticides they may be inelastic to the police response to their stealing, because they do not perceive the risk to themselves as having been significantly raised, yet elastic to the opportunity presented by police attention being focused on a particular crime by exploiting counterfeit pesticide opportunities – simultaneously elastic and inelastic by virtue of their diverse illicit activity. In practical terms be it one or separate OCGs involved in these rural crimes matters very little for the implications of Harcourt's paradigm for corporate and farmer victims of counterfeit pesticides are disconcerting; it implies that, provided the rural policing environment stays as it is, this is a crime that will continue to go unchallenged. It is a gloomy prospect for those who have to deal with the consequences, however, within the research results there are features that seemingly defy Harcourt, that are outside of the 'normal' pattern, and which give some prospect for police engagement with the problem.

The results of the research, specifically the qualitative FoIA request and the word frequency analysis data, suggest widespread and consistently high levels of

police engagement with one particular rural crime that is seemingly unconnected with theft from farms; hare coursing. This is a crime that, as was recognised in the results, would be considered to be outside of the typical police rural crime remit. However, because it is associated with more serious crime it is very actively policed. Seemingly this is a tenuous thread upon which to hold out hope for police engagement with the counterfeit pesticide problem, yet it may be an important one. Whilst acknowledging the obvious cruelty associated with this illegal hunting activity it would not be considered to be a major crime in policing terms. Nonetheless because it is framed as a precursor to other illegal activity, rather than an animal welfare problem, it attracts significant rural policing attention. Importantly this pattern of actively policing hare coursing was widely observed, there being police engagement with this crime across England and Wales often the reporting linking the perpetrators with OCGs and wider offending in the countryside. As this study moves toward drawing conclusions it is important to recognise the significance of this crime in the context of the UK counterfeit pesticide problem; because hare coursing is framed as an OCG indicator rather than a wildlife crime it attracts far more rural policing attention than it otherwise would.

#### **7.4 A summary of the interpretation and its resonance with critical criminological thinking**

The literature concerning the UK counterfeit pesticide problem is not academically robust. Contained primarily within industry generated reports and media coverage it lacks clear methodology and the claims made are not verifiable. Nonetheless it does contain a number of themes which, collectively, describe the mechanics of this crime. The consequence of this is that the industry response is similarly mechanical, focusing as it does on bolstering the legislative framework. It is important to understand the limitations of such a response; understanding and

changing the mechanics of the problem may well make life more difficult for the counterfeiter but it does not necessarily raise the risk to them. In considering the merged research results it became clear that appreciating the mechanics alone was insufficient to fully understanding the problem for it is shaped by a number of influences which together form create a unique market dynamic. Firstly understanding the nature of the market, and more specifically the fact that there is a substantial market for pesticides outside of core agriculture which is relatively unregulated, is important in appreciating that there is an underlying level of counterfeit pesticide activity within the UK. This can, and does, expand to meet opportunities in the agricultural sector as and when they arise. Secondly recognising that the pesticide industry itself is failing to make use of intelligence relating to incidence and perpetrators partly explains why this is a low risk enterprise for OCGs. Finally understanding the significance of a strong actuarial influence over rural policing in the UK goes some considerable way to explaining why the police have singularly failed to engage with the UK counterfeit pesticide problem.

This results of this study and the preceding interpretation have a strong resonance with contemporary critical thinking on rural crime which was discussed in the review of the literature. Specifically the influence of power and knowledge is observed both in the emergence of an industry generated discourse and its prevalence in the drive for reformed legislation and regulation, and in the formation of rural policing policy and practice.

The industry generated discourse has had a distinct influence over attempts to have European rules pertaining to the trade in parallel products reinforced. Of course this would make the abusive use of parallel trading rules a less attractive proposition. However, it would also make legitimate parallel trading a more difficult occupation to the obvious commercial benefit of mainstream pesticide manufacturers.

At the same time it would be fair to say that the interests of one particular section of rural society has been disproportionately represented in rural policing policy and practice. Whilst it could be argued that an insurance company is professionally detached from its customer base it is clear that the biggest provider of UK farm insurance is closely associated with the farming community and with their primary representative body. It is equally clear that the risk focus of that insurance company is driving contemporary rural policing.

Having recognised these influences and their consequence the thesis will now proceed to draw conclusions about this crime and to make recommendations that may mitigate its impact.

## **8.0 Conclusion and addressing the study aim**

The selling of counterfeit pesticides is a crime that has been the regular subject of both industry reports and media comment. There are numerous examples of such non-academic sources describing a crime that, when it occurs in the UK, is often associated with the trade in parallel products. Such publications describe untested and unapproved chemical formulations being sold to unwitting farmers by way of an abuse of legitimate European trading provisions. They also frequently warn that such illicit products have the potential to cause economic loss, environmental damage, and harm to spray operators or even members of the public. However, whilst there is consistency in the reporting of this crime the content could not be verified. Until this study there had been no academic research to support the industry derived information that is at the heart of this widely promulgated narrative.

The study identified a means of addressing this shortcoming, the chosen research design drawing on an IPO examination of the current state of counterfeiting research which recommended a multi-strand 'blended' approach to data gathering. The IPO concluded such research had the potential to produce a richer picture of any given counterfeiting problem when compared to a single strand study. Using a convergent parallel mixed-method design data was gathered from a cross-section of key stakeholders and those at the periphery of the problem who were, or at least should have been, concerned with its impact. When analysed this data went some way to confirming the core elements of the industry narrative. However, and perhaps more importantly, it also revealed a number of characteristics that had not previously been described.

By way of interpretation the analysed data also revealed an underlying market dynamic that serves to create a benign operating environment for those who choose to engage in this crime. The word dynamic, in this context, simply means a collection of



influencing factors that overlap to create a set of circumstances that would not otherwise exist. In this case it is the overlap of a market for illegal products that resides outside of core agriculture, a predominantly legalistic response from the pesticide manufacturing industry and their representative bodies, and a rural police service that is preoccupied with reducing theft from farms which together generate this dynamic. The significance of this is profound; it means that counterfeiting OCGs have a persistent foothold in the wider UK pesticide marketplace and are well placed to exploit opportunity in the agricultural sector at comparatively low risk to themselves whenever, and wherever, that opportunity arises. It is a finding that sits comfortably with the wider organised crime literature wherein the profit against risk equation is often described as being fundamental to the OCG business model.

This final section of the thesis will now return to the overall aim of the study by drawing a conclusion as to whether counterfeit pesticides represent a substantive threat to the UK agricultural industry. It will do so by way of recapping and considering the original aims of the study each of which represented a significant gap in the literature. These were:

- To determine if there is evidence of counterfeit pesticides being prevalent in the UK marketplace;
- Assuming there is evidence of a UK counterfeit pesticide problem to ascertain if this is being addressed through police engagement, and;
- If the police are not engaged with the problem to further consider why this might be the case.

Considering the first of these objectives the research suggests that counterfeit products are indeed a prevalent feature of the UK pesticide marketplace. However, the

extent to which they are present in any quantity may vary considerably over time, this in response to the market influences which have been previously described.

Nonetheless, and despite the significant fluctuation in occurrence rate, it would be fair to say that these products have a potential to cause economic, environmental and human harm which cannot be ignored. Indeed this study demonstrated actual impact through a case study of an incident which occurred on a UK farm the result of which was economic loss and notable environmental damage. Whilst such harms are, and will probably continue to be, difficult to properly quantify the review of the literature demonstrated how even a single incident such as this could, if it became public knowledge, have considerable and potentially long-lasting consequences for an entire industry sector. This study found nothing to assuage this fear. These findings go some way toward filling a significant gap in the literature with respect to the understanding of the nature of this crime, at least in so far as it occurs in the UK. Moreover they may be of interest to those industries who are similarly exposed to counterfeiting particularly where there is a link to the trade in parallel products.

Turning to consider the second study objective it would seem that this is a crime that has, thus far, failed to register on the rural policing agenda. The study found nothing that would suggest any policing activity related to this issue outside of that which came about as a direct consequence of data gathering activities connected with this study. By contrast the research has shown that theft, and more specifically theft from farms, is consistently at the centre of rural policing policy. Moreover this policy bias was shown to also be reflected in rural policing practice where operational policing is also demonstrably theft-centric. It appears then that the police, the primary agency responsible for tackling OCG activity, have singularly failed to engage with this problem and as a consequence the agricultural industry is unduly exposed to the repeated incursion of OCG counterfeiters. This finding reinforces previous literature which

describes theft-centric policing and will be of interest to those concerned with wider police policy setting.

This leads us to the third objective, for in considering why there is such an overt focus on dealing with theft from farms it appears that there is a pervasive actuarial influence over rural policing policy and strategy. This influence was to the extent that in reality, without some form of external intervention, the subject of this thesis is not, and is unlikely to become, a local rural policing priority. Of course this conclusion has a much wider implication; if the rural policing focus is, by virtue of external influence, destined to overlook this form of offending then it seems very likely that it will overlook other similar emerging rural crimes. It is quite possible then that the prevailing rural policing focus on theft from farms driven by a pervasive actuarial influence is the defining characteristic of contemporary UK rural policing. If this proves to be the case then this is a significant finding, and potentially the main contribution of this thesis toward the collective rural criminology and criminal justice body of knowledge.

Returning to consider the potential impact of this crime on the UK agricultural industry the pesticide industry has made significant and praiseworthy efforts to moderate the threat. However, these efforts have been predominantly focused on the mechanics of the problem. In the absence of any concerted and continuing enforcement agency support it seems likely that such a mechanical approach to tackling this crime, predominantly lobbying for legislative change, will only succeed in making it a more complex enterprise for OCG counterfeiters. Whilst this may well discourage some criminal activity without a concurrent enforcement agency response this strategy will not unduly raise the risk to the counterfeiter and so it is unlikely to dissuade all. Indeed in the absence of enforcement engagement such an approach, should it serve to instil confidence amongst consumers that all is well because legislation has been tightened, may actually make pesticides a more attractive OCG

proposition. This is not to dismiss a mechanical response. It is a crucial part of the anti-counterfeiting mix, but surely it is much less likely to be affective if it is implemented without giving consideration to the three strands of influence which together form the dynamic which shapes and drives the UK counterfeit pesticide problem.

In the light of the evidence presented it is difficult to conclude anything other than that the UK agricultural industry is vulnerable to the threat posed by counterfeit pesticides. It was the final objective of the study that, should it be shown that this is the case, recommendation be made to mitigate that threat and thus reduce the risks posed to the industry. This thesis will therefore draw on the evidence of the study in its entirety to highlight five areas within the market dynamic that provide scope for intervention. Each of these areas will be the subject of a recommendation which collectively amount to a nexus of initiatives which may disrupt the dynamic to the extent that it would render the UK pesticide market a less benign operating environment for the OCG counterfeiter.

## **8.1 Recommendations**

It is a synergistic truism of intelligence that its whole is greater than the sum of its parts. Indeed it could be argued that the disparate pockets of corporate knowledge pertaining to counterfeit pesticides held across the industry are insufficiently linked for them to be reasonably described as intelligence. Nonetheless the evidence suggests that these various pieces of the counterfeit pesticide jigsaw are an invaluable source of information about the crime and its perpetrators. However, there is currently no recognisable means of bringing this knowledge together into a usable form. Moreover the widespread and firmly entrenched fear of breaching competition law probably means that the consolidation of this information will not, and arguably cannot, happen

within the confines of the industry. What is required then is independence, both in terms of knowledge consolidation and interpretation, so that it becomes usable intelligence.

The need for independent intelligence expertise is equally true for the early identification of those factors that precipitate a spike in demand for a particular pesticide, particularly when it is likely that this cannot not be met by legitimate manufacturers. As was described these are the circumstances that give rise to an increased risk of counterfeit products being introduced in the agricultural pesticide market. At the point of increased risk indicative information will exist, but again this is effectively locked within individual companies and organisations and making no contribution toward any form of collective horizon scanning. It is the contention of this thesis that such information, commercially sensitive as it might be, could be shared for the greater good of the industry were it possible to do so through the auspices of a trusted independent third party. It is this need for both intelligence consolidation and horizon scanning that is the subject of the first recommendation:

### **Recommendation 1**

*That an independent industry information hub be created that would:*

- *gather, collate, and disseminate as appropriate industry generated 'real-time' intelligence concerning counterfeit pesticides in the UK;*

- *conduct ongoing horizon scanning to identify emerging crop production trends or crop influencing factors which would indicate that there is an increased risk of counterfeit pesticides entering the UK market<sup>82</sup>.*

Having recognised the importance of consolidating intelligence concerning the UK counterfeit pesticide problem it naturally follows that consideration be given as to how that intelligence would be used most effectively. At the outset it is as well to accept that, given the prevailing rural policing focus and current level of engagement identified in the research and considered in the interpretation of the results, it seems unlikely that approaching the police at a local level with intelligence pertaining to counterfeit pesticide would be particularly fruitful. Indeed whilst the problem carries its current label it is ever likely to be seen as a civil problem, a simple breach of intellectual property rights, rather than a crime problem necessitating a police response. It is suggested then that the UK counterfeit pesticide problem needs to be, for want of a better description, rebranded.

By presenting the problem not as a rural crime or a counterfeit problem but rather as a manifestation of OCG activity it opens up a potentially more effective channel to direct the accumulated intelligence. As was recognised in the review of the literature addressing OCG offending and the growing threat it poses to the UK is considered so serious that it is now addressed at a national level through the National Crime Agency (NCA). Moreover, and as was similarly recognised in the review, the

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<sup>82</sup> Whilst this study has been concerned with the counterfeit pesticide problem as it manifests itself in the UK context it is recognised that an intelligence hub of the type described would be a more economic and practical proposition were it to have a European wide remit. Such a pan-European hub would recognise the transnational nature of the crime and would likely receive greater support from an industry that is similarly multinational.

NCA has, as part of its overall approach to the OCG problem, a policy of engaging with industry for the purpose of intelligence sharing (sharing, rather than gathering, being an important distinction). Clearly the same principle applies as was noted in the first recommendation for in intelligence terms the whole is greater than the sum of the parts; a more effective response to a specific OCG crime problem is likely if it is understood in the context of the wider OCG picture. There is, therefore, a mutual benefit to this relationship.

Whilst focusing on the potential for industry engagement with the NCA it should not be overlooked that other relevant bodies, notably Trading Standards, also have a national intelligence function. By engaging with these enforcement agencies that are actively addressing the threat posed by OCGs, rather than with local police forces who do not perceive the counterfeit pesticide problem as being their concern, both the actual and perceived risk to the counterfeiter would be raised. If, as was suggested in the interpretation of results, OCGs have a relatively high elasticity of offending then their perception of the risk of being caught and prosecuted may, in terms of their propensity to enter this market, be as important as the reality. It is then the potential benefit of engaging with the police at a national level that gives rise to the second recommendation:

## **Recommendation 2**

*That a formal link be created between an independent industry intelligence hub and national strategic policing bodies, for example the NCA, and other appropriate intelligence agencies to share intelligence relating to counterfeit pesticides.*

Adopting a strategy of engagement at a national level, at least in the context of intelligence sharing, does not negate the need for local activity particularly for the purpose of raising awareness of the problem. Awareness raising serves several important functions:

- amongst operational rural police it means that any local initiative or operation that may result from the activities of the NCA or other intelligence led agency will find an informed audience and is therefore more likely to be acted upon;
- 'grass roots' intelligence, vital to fuel the strategy being proposed, will only be generated if those exposed to the counterfeit pesticide problem understand the threat and the long term benefits to be derived from the reporting of incidence or suspicion.

There is a fine line between judicious awareness raising and scaremongering. Any such awareness raising needs to be done with a great deal of care to avoid creating unnecessary concern amongst a public audience that may already be oversensitised to media driven health scares linked to pesticide use. Nonetheless the continuation, and indeed expansion, of an educational function has an important role in disrupting the counterfeit pesticide dynamic and is the subject of the third recommendation:

### **Recommendation 3**

*That the pesticide industry should support the continuation and expansion of initiatives to raise awareness of the counterfeit pesticide problem amongst the farming and supply sector communities and that further work be undertaken to:*



- *raise and maintain awareness amongst operational police officers and Trading Standards staff in those areas with a significant farming community;*
- *have awareness of the counterfeit pesticide problem included in relevant further/higher education and industry study and training programmes where it is not already.*

Having expounded the need for appropriate engagement with enforcement agencies it is worth tempering any enthusiasm for such an approach by acknowledging that an over-reliance on agency intervention is probably unwise. As this study has recognised enforcement agencies, and specifically the police, are subject to many persuasive external influences and demands.

The use of pesticides by the UK agricultural industry is highly professionalised and this has made a considerable contribution to ensuring that the counterfeit problem has remained relatively small compared to some other parts of Europe. Unfortunately this degree of professionalism does not extend across all UK pesticide use and as was recognised in the study this has given rise to an important source of vulnerability. Moreover, because of its very low profile, it is a vulnerability that is even less likely to make the enforcement agenda than the agricultural industry counterfeit problem. The study recognised that the amenity sector use of pesticides does not have the same imperative to ensure the provenance of inputs that crop assurance schemes instil in the agricultural sector. However, given that this sector may be the safe harbour in the UK for counterfeit pesticides there is a vested interest in the wider pesticide industry promoting and supporting the development of a more professional status for amenity pesticide use. Because doing so may reduce the scope for illicit products to enter the market this is the subject of the fourth recommendation:

#### **Recommendation 4**

*That the pesticide industry, through the auspices of representative and professional practice bodies, should support the professional development of amenity sector pesticide use and seek to raise awareness within the sector of the risks associated with counterfeit pesticides.*

All of the recommendations made thus far have collectively formed what is essentially a strategic response, each intended to disrupt the dynamic that shapes and drives the UK counterfeit pesticide problem. Whilst these are important in terms of reducing the overall risk they do not address one issue that emerged from the research; how to respond to a counterfeit pesticide incident at the point at which it occurs.

In the absence of recognised best practice or protocol individual pesticide companies, the corporate victim of the crime, are invariably left to deal with the aftermath and make good with the end user victim. Worse still, and as was observed in the case study, an incident may not be reported to any enforcement agency because of the uncertainty a farmer victim faces concerning what the eventual outcome might be. There is then a pressing need for an industry wide incidence protocol which engages all appropriate agencies and, as importantly, instils confidence to report because it removes uncertainty as what will happen and what the likely outcome will be. This need is addressed in the fifth and final recommendation:

## **Recommendation 5**

*That an evidence based immediate response strategy for any counterfeit pesticide incident be developed that is acceptable for dissemination by professional bodies and enforcement agencies as best practice.*

This thesis began by stating its aim of determining whether counterfeit pesticides represent a threat to the UK agricultural industry. Given that a threat is anything that can exploit vulnerability, and that this study has demonstrated that the industry certainly is vulnerable, it was difficult to draw any other conclusion than that this intersection of threat and vulnerability does give rise to a substantive risk. However, the extent of that risk, that is the potential for loss as a consequence of the threat exploiting the vulnerability, is less certain. Nonetheless the lesson that can be drawn from the wider European experience of counterfeit pesticides is that it brings risks that are both varied and potentially highly impactful. However, in terms of mitigating the threat this study has also demonstrated that it exploits a vulnerability that can be explained and understood, and with that understanding comes a means to respond.

Taken together the recommendations detailed above, and summarised in Appendix 9, amount to a strategy which has the potential to disrupt the dynamic that currently makes the UK pesticide market an attractive proposition to the counterfeiter. Better management of intelligence, if carried out in conjunction with horizon scanning, would enable valuable information concerning this crime to be relayed to intelligence agencies in a usable format. Provided these agencies are made sufficiently aware of the problem through education initiatives then there is a real possibility that the industry would witness a useful enforcement response. Moreover the capacity of the counterfeiter to respond to opportunity in the agricultural market would be reduced if

the amenity market were more counterfeit aware and if the post-incident response were better organised and used as an opportunity to gather intelligence and usable criminal prosecution evidence. If implemented alongside the mechanical measures currently favoured by the pesticide industry they would together make counterfeiting pesticides a more expensive and at the same time riskier enterprise for those OCGs involved in this illicit trade. Of course the threat would not be entirely removed, for the counterfeiter will always be ready to exploit an opportunity. Nevertheless the more industry vulnerability can be reduced then the more the threat posed by counterfeit pesticides will be diminished.

## **8.2 A consideration of the wider significance of the study and thesis**

This thesis has considered the threat posed to the UK agricultural industry by counterfeit pesticides, a question that had not previously been addressed by academic study. To do so necessitated an approach to data gathering that had a number of novel elements and one which overcame the shortcomings in counterfeit research that had previously been identified. The results of that research, once analysed, exposed several previously unrecognised characteristics of this illicit trade. Moreover following interpretation a dynamic that underpins the UK pesticide marketplace was recognised and described.

Whilst this approach to the subject may not have broken the mould of 'traditional' counterfeiting research it does at least provide an alternative to single strand studies, and one which advances the IPO recommendations into a practical and repeatable research design. Indeed there seems to be no reason why this should not be a transferable approach; conducting research to understand if there is a market dynamic underpinning the problem may be a logical starting point in understanding

counterfeiting in other market sectors. This has much wider implications in terms of tackling transnational organised crime. If counterfeiting is a significant funding source for other OCG activity then a better understanding of what makes it an attractive proposition may provide a means by which it may be better tackled.

Having expounded the virtues of this approach to counterfeiting research it is acknowledged that this study has been a first step toward fully understanding this particular iteration of the problem. Undoubtedly the study design could be further refined to identify if there are other more subtle sources of influence over the dynamic that creates the benign environment within which the UK counterfeit pesticide problem exists. That said, and even without refinement, given what has already been achieved this approach could also prove itself to be a useful means of exploring counterfeit pesticide incidence outside of the UK. Certainly it offers an alternative to those charged with addressing the problem in those parts of the world where counterfeit pesticides are endemic and where the current response strategies are seemingly not having an impact on the problem. At the same time the principles of the design could equally well be used as the basis for reviewing anti-counterfeit strategy and practice within individual manufacturing companies, particularly where a mechanical, perhaps legalistic, response has been favoured and has been found wanting.

Counterfeiting, in its multifarious guises, is a particularly insidious crime. This thesis has shed light on one example of the problem, and has proffered means by which the threat it carries may be alleviated. In the course of doing so the thesis has addressed a number of significant gaps in the literature. This in itself is a useful contribution to knowledge, however, it is suggested that this study and thesis has served a further but equally important function. By seeking and making use of non-mainstream theory it has gone some way toward addressing a shortcoming in the study

of rural crime and policing, specifically the narrow theoretical focus which was described in the review of the literature.

The significance of critical thinking in understanding rural crime was recognised early in this thesis. By drawing on the theorising of Bernard Harcourt this study has added an extra dimension to this approach. It is hoped that this may help researchers to better appreciate the significance of power and knowledge in the creation of an environment within which a crime can emerge and thrive. In doing so it is further hoped that it has enhanced this criminological theory and may prompt and assist much needed research into the subject in the future.

## 9.0 Appendices

### Appendix 1: A personal reflection on the insider/outsider dichotomy

It is not unusual for a researcher to study a group or organisation to which they belong, essentially positioning his or herself as an 'insider' to their research domain. This compares to research 'outsiders'; those that do not belong to the group they are studying. There are considerable research advantages to be derived from insider status in terms of understanding a group's culture, an ability to interact naturally with group members, and a greater relational intimacy (Breen, 2007). At the same time it has been recognised that being an insider may disadvantage a study in terms of objectivity because an investigator may struggle to reconcile their insider role with the role of researcher (Kanuha, 2000). This paradox was succinctly described by Kanuha;

For each of the ways that being an insider researcher enhances the depth and breadth of understanding a population that may not be accessible to a non-native scientist, questions about objectivity, reflexivity, and authenticity of a research project are raised because perhaps one knows too much or is too close to the project and may be too similar to those being studied. (Kanuha, 2000, p.444).

This paradox has been variously labelled but is probably most easily understood as the insider/outsider dichotomy (Breen, 2007). However, some have argued that the construct of a dichotomy is too simplistic because fails to capture the role of all researchers and in particular those that do not see themselves as naturally falling into either category. Alternative concepts are offered; that the role is better conceptualised on a continuum, where a researcher may occupy as position of neither

insider or outsider, or that researchers are perfectly capable of occupying 'the space between', allowing one to simultaneously occupy the position of both insider and outsider (Breen, 2007; Dwyer & Buckle, 2009). Whilst these alternatives are seemingly diametrically opposed they are unified by an underlying principle; that holding membership of a group does not denote complete sameness and that not being a member is not indicative of complete difference (Dwyer & Buckle, 2009).

The issues raised by this question of insider/outsider status was pertinent to this study because, at the time of research being undertaken, the researcher had an employer/employee relationship with a large UK non-metropolitan police force. Clearly, given that the study focused on the police response to a crime problem, this apparent insider position carried the risk of being accused of being too close to the research to be truly objective. This could not be simply dismissed as irrelevant, perhaps relying on the strength of the review process to underwrite complete impartiality, not least because it remained a genuine concern to the researcher. As a consequence it prompted a period of self-reflection on the implications of holding a position as a police employee vis-à-vis this particular piece of research. What follows is the author's first-person narrative summarising that reflection:

This study was result of a chance encounter with an online newspaper article which highlighted the growing counterfeit pesticide problem across Europe. The article was somewhat thin on detail but it rang a personal chord; my own professional background, prior to working within a police intelligence and specialist operations department, had been in the agricultural supply industry. I was then in an unusual position of being a criminologist with an agricultural background.



The key element of this crime, counterfeiting, was outside of my day-to-day remit. Of course this meant that undertaking any research into this area would necessitate 'starting from scratch', with no prior knowledge of the subject beyond a broad understanding of police policy setting and procedures. On the other hand it did mean freedom from any preconceived ideas about the cause or consequence of the crime and no established subject specific relationship with those responsible for its policing.

At the same time what this employer/employee relationship did bring was trust. Policing has a long standing reputation for having its own unique and somewhat impenetrable culture. My own experience over a 25 year relationship with the police service has done little, at a personal level, to dispel this reputation. Getting access to large numbers of police officers and staff for quantitative study, or high level access to policy setters for qualitative interviews, would be difficult for an 'outsider', particularly one lacking a reputation for work in this field. Holding a relatively senior position within the force, and having studied for some years with the support of the organisation, brought an invaluable reputation for integrity and academic ability. This gave a degree of access to and support from a police force that would otherwise have been very difficult to achieve.

Without dismissing the concerns of those that might point to this insider status as a barrier to effective research on reflection it seemed that, in the circumstances, having a professional detachment from the immediate problem was most significant. It allowed me to step away from the position of simply being an obvious insider to occupy the 'space between'; to simultaneously be an insider, enjoying the benefit of being able to understand and negotiate the cultural barriers to interact naturally with group members, and an outsider, sufficiently detached from the core subject to retain professional and research objectivity. It therefore also seemed reasonable, provided it

could be demonstrated that this police force was an appropriate sample, to take advantage of a degree of access that this relationship afforded and which would be denied to most.

**Appendix 2: Survey feedback form**

a) Which of the following would best describe your occupation:

	X
I own or work for an organisation or business that uses pesticides in the course of its normal activities	
I own or work for an organisation or business that supplies and/or distributes pesticides but does not manufacture them	
I own or work for a business that manufactures pesticides	
I work for an agency that enforces pesticide regulations (e.g. HSE)	
I work for an agency that enforces the law but is not directly concerned with pesticide regulation (e.g. police or trading standards)	
I work for an organisation that represents businesses that use, distribute or manufacture pesticides (e.g. NFU or AIC)	
None of the above	

b) Did you understand what the survey was about and what the results may be used for?

	X
Yes	
No	

c) Did you feel comfortable answering the questions?

	X
Yes	
No	

d) If not which questions made you feel uncomfortable?

--

e) Is the wording of the survey clear?

	X
Yes	
No	

f) If not which questions were not well worded?

--

g) Was the time reference (i.e. "the past 12 months") easy to understand?

	X
Yes	
No	

h) Did any of the questions require you to think too long or hard before responding?

	X
Yes	
No	

i) If yes which questions?

--

j) How long did the survey take you to complete?

k) Do you think there are any important issues that have been overlooked?

Thank you for participating in this feedback exercise. Your comments will be used to refine the survey before it is used in the study.

I would be grateful if you would email your completed feedback form directly to:

[email address redacted]

### Appendix 3: Survey questionnaire

Thank you for participating in this survey.

The information gathered will be used as part of a rural crime study being supported by Thames Valley Police. Your contribution will be entirely anonymous. The results of the survey may be used to support police and industry rural crime prevention initiatives.

If you have any questions or wish to discuss the survey the lead researcher can be contacted directly by email: [email address redacted]

---

1. In the past 12 months do you think that public interest in rural crime has:

	X
Gone down	
Stayed about the same	
Gone up	
I don't know	

2. In the past 12 months do you think that media coverage of rural crime has:

	X
Gone down	
Stayed about the same	
Gone up	
I don't know	

3. In the past 12 months do you think that the amount of attention the police give to rural crimes compared to other crime has:

	X
Gone down	
Stayed about the same	
Gone up	
I don't know	

4. Which of the following have you ever accessed as a source of crime prevention advice:

	X
Home Office or other GOV.UK website	
Police website or other police information source	
NFU website or other NFU information source	
Product manufacturer's website or other manufacturer's information source	
TV/radio	
Specialist media (e.g. trade or occupation related press)	
Independent security company or advisor	
Other (please detail below)	
I have never accessed any crime prevention advice	

5. Which of these have you accessed as a source of crime prevention advice in the past 12 months:

	X
Home Office or other GOV.UK website	
Police website or other police information source	
NFU website or other NFU information source	
Product manufacturer's website or other manufacturer's information source	
TV/radio	
Specialist media (e.g. trade or occupation related press)	
Independent security company or advisor	
Other (please detail below):	
I have not accessed any crime prevention advice in the past 12 months	

6. On a scale of 0 - 5, where 0= never and 5= very often, compare the following rural crimes in terms of how often you think they occur:

	0-5
Farm plant/machinery theft	
Illegal dumping of waste	
Metal theft	
Hare coursing	
Farm input theft (fertilizer/seed etc.) excluding fuel	
Counterfeit pesticides	
Fuel theft	
Poaching	
Crop/livestock theft	

7. Considering the same list of rural crimes how would you rate the amount of attention the police give to each:

	Not enough	About right	Too much
Farm plant/machinery theft			
Illegal dumping of waste			
Metal theft			
Hare coursing			
Farm input theft (fertilizer/seed etc.) excluding fuel			
Counterfeit pesticides			
Fuel theft			
Poaching			
Crop/livestock theft			

8. In terms of the likely financial or resource impact they might have on your own business or organisation if you had to pick a 'top three' of these rural crimes which would they be? [If only one or two are relevant just indicate these]

	X
Farm plant/machinery theft	
Illegal dumping of waste	
Hare coursing	
Farm input theft (fertilizer/seed etc.) excluding fuel	
Counterfeit pesticides	
Fuel theft	
Poaching	
Crop/livestock theft	



**9. Are you aware that pesticides made by legitimate manufacturers are sometimes illegally copied and sold?**

	X
Yes	
No	

[If yes go to Q10 if no go to Q15]

**10. Which of the following would best describe your occupation:**

	X
I own or work for an organisation or business that uses pesticides in the course of its normal activities (e.g. farmer or grower)	
I own or work for an organisation or business that supplies and/or distributes pesticides but does not manufacture them	
I own or work for a business that manufactures pesticides	
I work for an agency that enforces pesticide regulations (e.g. HSE)	
I work for an agency that enforces the law but is not directly concerned with pesticide regulation (e.g. police or trading standards)	
I work for an organisation that represents businesses that use, distribute or manufacture pesticides (e.g. NFU or AIC)	
None of the above	

[If none of the above go to Q15]

**11. How would you describe your personal knowledge of the threat posed to UK agriculture by counterfeit pesticides?**

	X
Poor or none	
Fair	
Good	
Very good	

12. Thinking again about the crime prevention advice you have seen or heard over the past year do you recall any of it relating to counterfeit pesticides?

	X
Yes	
No	

[If yes go to Q13 if no go to Q15]

13. Where did you hear or see the advice relating to counterfeit pesticides? [please say if you do not recall]

14. Which organisation was the source of the advice relating to counterfeit pesticides? [please say if you do not recall]

15. If a pesticide user became suspicious that a product delivered to them might be counterfeit which of the following organisations do you think they should contact first?  
[select one only]

	X
The manufacturer of the genuine product being copied	
The supplier of the product	
Health and Safety Executive	
Local police	
Department for Environment, Food & Rural Affairs (Defra)	
Trading Standards	
National Farmers Union (NFU)	
Other (please detail below):	

16. Thank you for participating in this survey. Is there any other information or comments that you would like to make known to the research team?

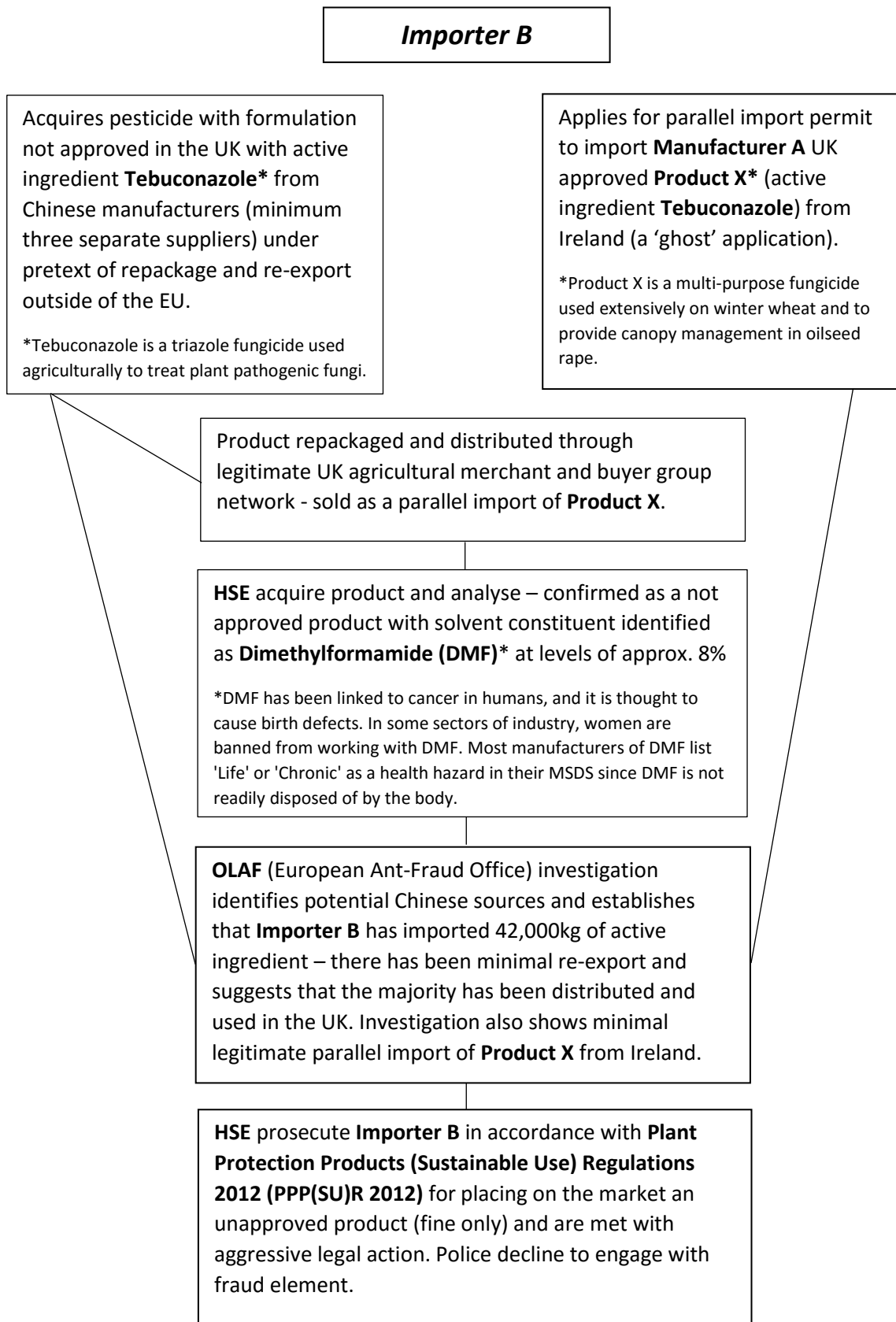
#### **Appendix 4: Enforcement case study**

The following enforcement case study, which is summarised in Figure 9.1, is based on an investigation conducted in 2009 the case papers relating to which study participant #08 gave the author controlled access. This incident closely reflects the 'Hornet' model of counterfeit pesticide distribution which is described in Appendix 5.

The manufacturer victim in this case (Manufacturer A) was a multi-national company and the product being counterfeited was one of their most valuable branded products, a fungicide designed for use on cereal crops (Product X).

The alleged offender in this case was a parallel importing company (Importer B) who was known to have applied for parallel import licenses to bring Product X into the UK from Ireland. Product X was to be repackaged and sold as a parallel traded product but under a new name, Product Y, given by Importer B.

A sample of Product Y was obtained by the enforcement authority having been voluntarily surrendered by an agricultural merchant pesticide distributor who was suspicious of the authenticity of the product. This sample was tested in the authority laboratory and the active ingredient identified as Tebuconazole, a fungicide widely used to combat plant pathogenic fungi. This was consistent with the genuine product. However a full analysis showed that the profile of other constituent parts did not match the genuine product. The original was known to contain dimethyldecanamide, a commonly used surfactant, whereas the seized product contained the solvent dimethylformamide at a level in the order of 8% of the total volume. Participant #08 described this substitute solvent as being a known carcinogen that is prohibited for use in UK pesticides. It was his opinion that it would be sufficiently persistent to get into the food chain.



**Figure 9.1:** Enforcement case study flow diagram

A subsequent investigation by the European Anti-fraud Office (OLAF) found that the product had been imported from China. Moreover analysis of additional test purchases of this product suggested that it had been sourced from at least three separate manufacturers. The investigation further revealed that Importer B had acquired something in the order of 42,000kg of this product. It was believed that this had been destined for the UK and that it had found its way into circulation through the legitimate pesticide trade.

The case resulted in Importer B being prosecuted for a technical offence under the Plant Protection Products Regulations 2011 (PPPR 2011) which deals with the placing on the market an unauthorised product. It is an offence for which the maximum penalty is a fine. No other offences were pursued.

## **Appendix 5: The 'Hornet' Model of counterfeit pesticide distribution**

The Health and Safety Executive (HSE) describe the parallel trade in pesticides as follows:

Parallel trade permits allow a company to import and place on the UK market a product already authorised in another Member State (Member State of Origin) under the EU Biocides Regulation (EU BPR), provided an identical product is already authorised under EU BPR in the UK (reference product) (Health and Safety Executive, 2015).

Such trading facilities are the cornerstone of the free trade in goods across the EU, however, in the case of pesticides it is one that has been subject to abuse by rogue traders. The means by which this abuse occurs has been dubbed the Hornet Model by the author:

- In the Hornet Model the rogue trader makes multiple applications to HSE for permits to import named pesticides from a variety of EU states outside of the UK. It is likely that an amount of pesticide will be acquired in strict accordance with the permit. This provides legitimacy to the trader and a source of documentation should it be necessary to prove the authenticity of a product they subsequently trade into the UK market.
- At the same time the rogue trader will have sourced and acquired counterfeit product from a third party source at a much cheaper price than the genuine product is available in the UK or elsewhere in the EU. Ostensibly, at least so far as any regulatory body is concerned, this product is destined for re-export out of the EU having been repackaged and branded to add value. This is a legitimate practice, and again it provides credence to the trader and a source of viable documentation.

- However, in practice the counterfeit product is not re-exported, rather it is switched into the parallel trade market and repackaged to meet this need. The Hornet description reflects the fact that simultaneous trading is occurring, the two wings of the hornet, and a legitimate and seemingly harmless public face.
- At the same time the hornet has a considerable sting in its tail – the selling of counterfeit products to distributors and farmers who are unaware of its provenance because the company they are dealing with appears to be entirely legitimate.

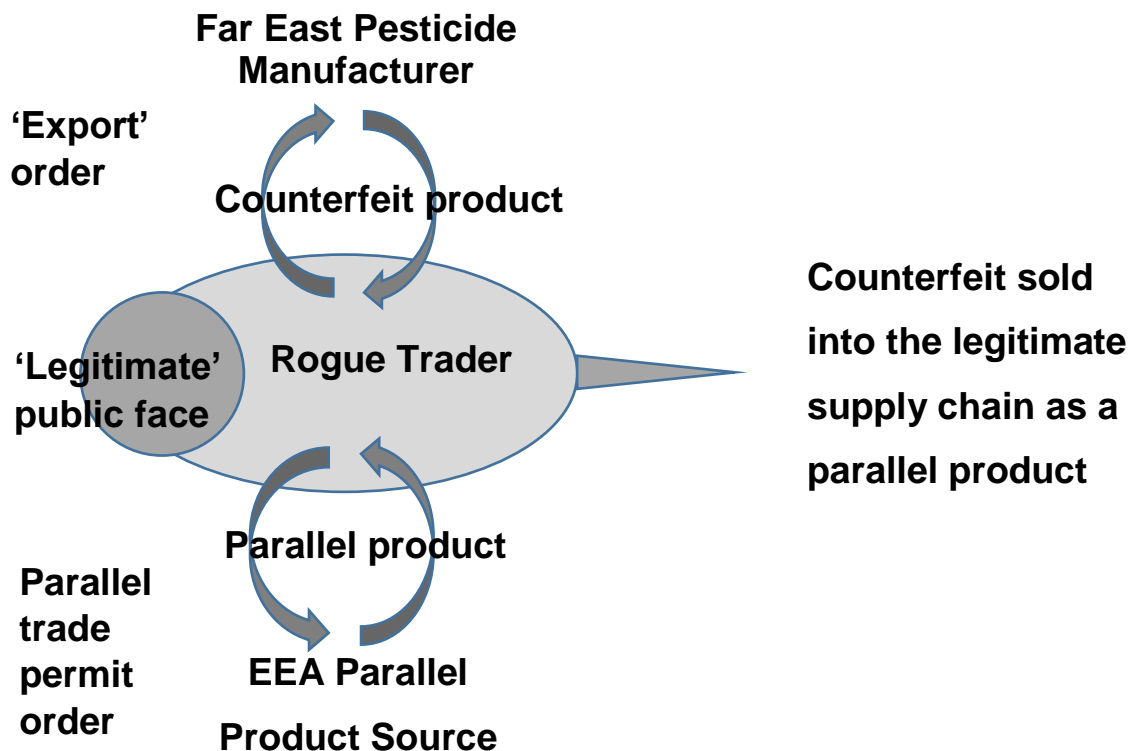


Figure 9.2: The 'hornet' model of counterfeit pesticide distribution



**Figure 9.3** has been removed for copyright reasons

**Appendix 6: SPSS output for the Mann-Whitney tests carried out on survey data**

**Test 1: Awareness - Police staff / Pesticide users**

**Ranks**

Occupation		N	Mean Rank	Sum of Ranks
VAR02_Awareness	Pesticide users	115	240.22	27625.00
	Police staff	290	188.24	54590.00
	Total	405		

**Test Statistics<sup>a</sup>**

	VAR02_Awareness
Mann-Whitney U	12395.000
Wilcoxon W	54590.000
Z	-4.769
Asymp. Sig. (2-tailed)	.000
Exact Sig. (2-tailed)	.000
Exact Sig. (1-tailed)	.000
Point Probability	.000

a. Grouping Variable: Occupation

**Test 2: Awareness – Police staff / Control group**

**Ranks**

Occupation		N	Mean Rank	Sum of Ranks
VAR02_Awareness	Control group	647	470.06	304131.00
	Police staff	290	466.63	135322.00
	Total	937		

**Test Statistics<sup>a</sup>**

	VAR02_Awareness
Mann-Whitney U	93127.000
Wilcoxon W	135322.000
Z	-.222
Asymp. Sig. (2-tailed)	.824
Exact Sig. (2-tailed)	.880
Exact Sig. (1-tailed)	.443
Point Probability	.059

a. Grouping Variable: Occupation

### Test 3: Knowledge - Police Staff / Pesticide users

**Ranks**

	Occupation	N	Mean Rank	Sum of Ranks
VAR03_Knowledge	Pesticide users	67	76.87	5150.50
	Police staff	91	81.43	7410.50
	Total	158		

**Test Statistics<sup>a</sup>**

	VAR03_Knowledge
Mann-Whitney U	2872.500
Wilcoxon W	5150.500
Z	-.711
Asymp. Sig. (2-tailed)	.477
Exact Sig. (2-tailed)	.486
Exact Sig. (1-tailed)	.246
Point Probability	.004

a. Grouping Variable: Occupation

### Test 4: Knowledge - Police staff / Control group

**Ranks**

	Occupation	N	Mean Rank	Sum of Ranks
VAR03_Knowledge	Control group	211	153.62	32413.00
	Police staff	91	146.59	13340.00
	Total	302		

**Test Statistics<sup>a</sup>**

	VAR03_Knowledge
Mann-Whitney U	9154.000
Wilcoxon W	13340.000
Z	-.718
Asymp. Sig. (2-tailed)	.473
Exact Sig. (2-tailed)	.474
Exact Sig. (1-tailed)	.237
Point Probability	.004

a. Grouping Variable: Occupation

**Appendix 7** has been removed for copyright reasons

## **Appendix 8: Seeking an appropriate theoretical model**

At the outset of this study it was acknowledged that there was no commonly used theoretical approach to the thesis subject. This was unsurprising given its relative newness and the lack of academic engagement as was recognised in the review of the literature. However, in the course of the study the key features of the crime, and the primary influences over its proliferation, became apparent. This facilitated a return to the literature, and more specifically to that concerned with criminal justice theory, to consider if there was an explanatory model that might accommodate what had been observed.

Hopkins Burke, in considering modes of governance, argues that crime control throughout most of the twentieth century was dominated by an interventionist approach. Drawing upon Feeley and Simon (1994) he concludes that the resulting process “was concerned with the identification of the individual criminal for the purpose of ascribing blame, and the imposition of punishment and treatment” (Hopkins Burke, 2005, p.244). The work of King (1981) is also useful in this context. In considering various models of criminal justice the characteristics and complexities of this particular paradigm are understood using a crime control model wherein the police are primarily concerned with fighting crime and bringing the guilty to justice. In King’s model the allocation of police resources is seen as predominantly being the product of how often a crime event happens and the relative impact of that particular ‘happening’, giving a rudimentary measure of how serious a particular crime was considered to be. In practice then the allocation police resources broadly followed recorded crime trends - essentially a linear response.

This intervention model of criminal justice held good until the 1970’s when UK politics started to be increasingly influenced by broadly libertarian principles. As Hopkins Burke (2005, p.244) observes Garland (1996) recognised that the

governmental style that grew out of this new politics was largely organised around economic forms of reasoning. Pfeffer and Salancik are useful here in that they suggest that organisations, whether they be small or large, public or private sector, are “inescapably bound up with the conditions of their environment” and that “the very key to organisational survival is their ability to acquire and maintain resources” (Pfeffer & Salancik, 2003, pp.1-2). In this shifting political environment it was probably inevitable that policing strategy would increasingly come to reflect the new economic imperative.

The popular view of crime that ran parallel to this was entirely compatible with the new economic liberalism. Seen as largely a matter of opportunity the focus increasingly fell on criminogenic situations rather than criminal individuals, exemplified in the situational crime prevention strategies so forcefully promoted by Clarke (1997). It has been argued that such strategies were driven by insurance companies responding to escalating levels of theft and burglary by pressurising governments to focus on crime prevention (O'Malley, 2010, p.26). This fundamentally new approach replaced the time-honoured practice of preventing crime through police presence with the creation of situations and environments intended to make offending more risky and less attractive to the potential offender. Criminal behaviour, and the pursuit of the criminal individual, now came second to more economically efficient strategies for crime prevention based on risk assessment.

In an environment increasingly dominated by economic considerations and where the police are, as Ericson and Haggerty (1997) described, part of a network of organisations responsible for the identification, management and communication of risk the linear response model of police resource allocation became increasingly untenable. Policing could no longer be seen as a simple function of incidence and consequential damage because this takes no account of probability, the principle which is the very foundation of a risk based approach to policing. It is important to understand the

principle that underlies the model; it may be stating the obvious to say that risk assessment is probabilistic rather than determinist but recognising this to be the case is crucial to understanding the sea-change that the adoption of this risk based approach has brought to contemporary rural policing.

Risk is rarely the sole influencing factor in any policing strategy. Nonetheless, where it at least partly shapes policing practice it is characterised by preventative interventions based on predictive techniques (O'Malley, 2010). Where these are rooted in statistical mathematics and calculations of probability they may be described as actuarial and the resulting policing practices as actuarial justice. Bernard Harcourt (2006, p.1) gives a useful working definition of actuarial practice when used in the criminal law context, describing it as:

...the use of statistical rather than clinical methods on large datasets to determine different levels of criminal offending associated with one or more group traits, in order (1) to predict past, present or future criminal behaviour and (2) to administer a criminal justice outcome.

Sometimes referred to as 'mechanical prediction' actuarial practices are widely recognised as having their origins in the rapid expansion of insurance-based risk calculations over the latter part of twentieth-century (Feeley & Simon, 1994). The management techniques most closely associated with this trend are now firmly entrenched in criminal justice practice, offender management being an oft-cited example (Kemshall, 2003). Where they appear they are often linked to rational choice theory (Harcourt, 2006), a utilitarian view of the cause of crime which relies on the presumption that an individual will weigh the benefit of committing crime against the likely or potential cost. It therefore follows that crime can be controlled by influencing

that choice through the use of measures which increase the potential cost to the criminal. This notion of individual choice is seemingly paradoxical when considering a wholesale shift in policy focus away from the individual and toward managing criminogenic situations. However, as Simon (1987) argues, actuarial practices lean toward the objectification of individuals, the implication being that criminals may be aggregated into homogenous groups, ignoring individual criminal propensity in favour of the creation of 'situation' where the cost of crime outweighs the potential benefit. It is then a strategy that presumes the validity of rational choice whilst downplaying the importance of the individual.

Of significance to this study there are indications within the results to suggest that such 'situation creating' may be prevalent in the contemporary policing of rural crime and may even be the defining feature of policing in the rural environment. We see this made manifest in, for example, the proliferation of rural crime initiatives and rural based 'watch' schemes highlighted in the word cluster analysis. It may reasonably be hypothesised that this emphasis on situational crime prevention is indicative of an actuarial influence; the relationship between the prevailing police interpretation of what constitutes a rural crime and the dominant insurance perspective of crime in the countryside. It is an increasingly important relationship, as witnessed by in-depth interviews with police rural crime policy setters carried as part of this study who embraced actuarial data as a measure of the effectiveness of rural policing.

Whilst liaison and cooperation between police and industry is surely to be encouraged and developed it is important to recognise that risk, in this or any other context, is not value free and it follows that any such a relationship will reflect this. As Freudenberg (1988,1993) argues the prevailing definition of any risk is inevitably the product of vested interest. It may therefore be hypothesised that it is just such an interest, made manifest through actuarial influence and acting upon police rural crime



policy and practice, which has been a primary factor in counterfeit pesticides failing to make it onto the rural crime agenda. Actuarial practices are therefore seen as a key component of the social and political construction of crime and as such they are responsible for the normalisation of a narrow police perception of offending in the rural setting. Considered in the context of the risk based model of policing it is this influence that has defined how theft from farms has come to be prioritised and actively managed whilst other crime problems, counterfeit pesticides included, attract a distinctly passive approach.

To aid understanding of how this influence manifests itself the interpretation of results will draw on the previously cited work of the critical theorist Bernard E. Harcourt, and specifically his criticism of predictive methods based on actuarial principles when used in the criminal justice setting (Harcourt, 2006). Harcourt proposes three reasons why we should be sceptical of the value of actuarial practice in the criminal justice setting. Two of his criticisms, namely that any reliance on probabilistic methods produces a distortion in the carceral population and that the proliferation of actuarial methods is beginning to distort our understanding of just punishment, are of limited interest and relevance to this study. Harcourt acknowledges that not all of his criticisms will be persuasive in every context (Harcourt, 2006, p.3), however, a third criticism is highly pertinent for here he contends that an increasing reliance on predictive methods may well increase the overall amount of crime rather than reduce it.

Important to understanding the significance of Harcourt's theorising is the concept of a relative elasticity of offending, that is to say the degree to which changes in policing strategy and practice will affect crime patterns. The relevance of the concept is that if, as Harcourt suggests is perfectly possible, those potential offenders targeted by the police through actuarially driven situational crime prevention practices are *less* responsive to the initiative than the non-targeted group then the overall amount of

crime will likely *increase* (Harcourt, 2006). In the context of this study this hypothesis gives rise to a relatively simple idea; if the police focus their attention and resources on situational crime prevention strategies which target a narrowly defined group of potential criminals, and this group do not respond as anticipated, then crime will not go down and in addition the police inadvertently create opportunity for non-targeted groups to engage in their chosen form of criminality relatively unhindered.

Harcourt qualifies his own theorising by acknowledging that it is bound to be problematic in the absence of a reliable means of measuring relative elasticity of offending. However, whilst an absolute measure may be elusive it is worth remembering that a notable conclusion from the original literature review was that large scale counterfeiting is almost exclusively the domain of organised criminality, and that organised crime groups are characterised by their opportunistic and entrepreneurial nature. It would therefore be a reasonable assumption that the relative elasticity for this particular group is high if only by virtue of their innate ability to recognise a low risk, high return opportunity. This of course renders Harcourt's criticism of actuarial practice highly pertinent in the context of this study if, within any given policing area, organised criminal groups are cognisant of the opportunities presented by the counterfeit pesticide market and further recognise that this is a crime that falls outside of the prevailing rural crime focus. The theory therefore has a genuine resonance with the findings of this study and will be used in support of the interpretation of the results.

## **Appendix 9: Summary of recommendations**

### **Recommendation 1**

*That an independent industry information hub be created that would;*

- *gather, collate, and disseminate as appropriate industry generated ‘real-time’ intelligence concerning counterfeit pesticides in the UK;*
- *conduct ongoing horizon scanning to identify emerging trends which would indicate that there is an increased risk of counterfeit pesticides entering the UK market.*

### **Recommendation 2**

*That a formal link be created between an independent industry information hub and national strategic policing bodies, for example the NCA, and other appropriate intelligence agencies to share intelligence relating to counterfeit pesticides.*

### **Recommendation 3**

*That the pesticide industry should support the continuation and expansion of initiatives to raise awareness of the counterfeit pesticide problem amongst the farming and supply sector communities and that further work be undertaken to;*

- *raise and maintain awareness amongst operational police officers and Trading Standards staff in those areas with a significant farming community;*
- *have awareness of the counterfeit pesticide problem included in relevant further/higher education and industry study and training programmes where it is not already.*

**Recommendation 4**

*That the pesticide industry, through the auspices of representative and professional practice bodies, should support the professional development of amenity sector pesticide use and seek to raise awareness within the sector of the risks associated with counterfeit pesticides.*

**Recommendation 5**

*That an evidence based immediate response strategy for any counterfeit pesticide incident be developed that is acceptable for dissemination by professional bodies and enforcement agencies as best practice.*

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## **11.0 A postscript to the thesis; the likely consequence of the United Kingdom leaving the European Union**

On 23<sup>rd</sup> June 2016, ten days after this thesis was submitted, the United Kingdom voted in a referendum to determine whether its future should be as part of the European Union. Against general expectation the outcome of that vote was that it should not.

A significant proportion of this thesis has been concerned with an abuse of parallel trading provisions which exist by virtue of membership of the EU. It would be naïve to think that an end to these trading provisions will bring an end to the threat posed by counterfeit pesticides. Indeed it seems inevitable that both manufacturer victims and concerned enforcement agencies will enter a period of considerable uncertainty. Not least because, at least at the time of writing, there was no indication as to what the future trading relationship between the UK and the EU might look like. We therefore cannot begin to anticipate how those responsible for the trade in counterfeit pesticides will seek to capitalise on this changed relationship.

This thesis has proposed that a means of tackling a counterfeiting problem is to be found in understanding the underlying dynamic which creates a benign operating environment for the counterfeiter. A likely consequence of the UK leaving the EU is that a new dynamic will emerge which may, or may not, further encourage the activities of Organised Crime Groups who are involved in counterfeiting. For this reason there is an urgent need to continue research into this subject.