

COUNTERFEIT PLANT PROTECTION PRODUCTS: A MIXED-METHODS STUDY OF AN EMERGING CRIME THREAT TO THE AGRICULTURAL INDUSTRY



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Abstract: The proliferation of counterfeit plant protection products (pesticides) across Europe has been well documented by both industry and popular media sources wherein the economic, environmental, and human costs are graphically described. However, this narrative is largely based on industry derived information. A recent UK Intellectual Property Office (IPO) assessment of such industry generated reports was sceptical of the data they contain and questioned their usefulness as the basis for response. The aim of this study was to produce data such that the extent of the threat posed to the UK agricultural industry by this crime could be ascertained. This was achieved by taking a blended approach, a strategy endorsed by the IPO as a means of more accurately capturing the true nature of a counterfeiting problem. The study was convergent parallel mixed method in design. The results of the study suggest that the industry and media narrative is a reasonable reflection of the UK counterfeit pesticide problem, at least to the extent that it recognises the typical *modus operandi*. However, the study also highlighted a number of characteristics of UK rural policing which essentially exclude this emerging crime from the rural policing agenda. Primary amongst these was an actuarial influence giving rise to a propensity to respond to risk as portrayed by those engaged in insuring against loss. This has significantly narrowed the rural policing focus. The study continues, drawing upon the results to develop strategies to mitigate the threat it poses to the UK agricultural industry.

Keywords: actuarialism; counterfeiting; organised crime; pesticides; United Kingdom.

INTRODUCTION

The worldwide trade in counterfeit goods has grown exponentially in recent years with strategic analysis suggesting that there is unlikely to be a reduction in this pattern in the foreseeable future (National Crime Agency, 2014). In considering what lies behind this rapid expansion the early part of the twenty-first century has seen the convergence of a number of factors which have collectively served to create a comparatively benign operating environment for those behind this trade. 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 now ubiquitous nature of digital mobile communication and

the internet has brought together, at least in a virtual sense, illicit manufacturer, distributor and buyer and provided a variety of means by which the proceeds of the consequential crime can be legitimised (International Institute of Research Against Counterfeit Medicines, 2013; Levi, 2008, WIPO, 2009; 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 Union, means that the movement of counterfeit items is not constrained to anything like the extent it once was (Vithlani, 1998). However, whilst these are undoubtedly important influences it has been suggested that the growth in counterfeiting as a worldwide crime problem has been driven more by the activities of Organised Crime Groups (OCGs) than any other factor (Stumpf et al., 2011).



On all but the smallest of scales counterfeiting is the domain of complex crime organisations which base their operations on an implicit risk/return calculation (Staake et al., 2009). A rational actor view of counterfeiting operations would see these groups as constantly seeking to maximise profit and therefore consciously electing to engage in counterfeiting in preference to other illicit activity (Williams and Godson, 2002; Cabinet Office Strategy Unit, 2009). The return 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 (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 and 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 and, as Coyne & Bell (2011: 71) describe, 'move quickly to take advantage of opportunities and avoid unnecessary risk'. It would seem then that OCGs have recognised that 'humdrum' crime is safer (The Economist, 2014).

COUNTERFEIT PLANT PROTECTION PRODUCTS (PESTICIDES)

The physical risks associated with untested pesticides being deployed on crops destined for human consumption is probably self-evident. This is an important consideration, for in simple economic terms fake pesticides constitute a relatively small part of the overall counterfeiting problem. That said it is not insignificant; a recent European Parliament library briefing estimated the market value of pesticides within the European Union to be in the order of EUR 8 billion per year (Erbach, 2012). The European Crop Protection Association estimates that in Europe somewhere between 7 % and 10 % of the crop protection products in the open market are illegal (Drury, 2014) and it is likely that the consequential cost to manufacturers in terms of lost business is to be in excess of EUR 0.5 billion a year.

Given the obvious economic and potential environmental and human costs of this counterfeit problem it is surprising that there is a near absence of associated criminological or criminal justice research. Less surprising is that, in the absence of academic support, the response has been based upon industry generated reporting of the problem. This is a common anti-counterfeiting practice, and one that has been criticised by the Intellectual Property Office (IPO), an executive agency sponsored by the UK Department for Business, Innovation & Skills (Collopy et al., 2014). The IPO concluded that industry derived studies are generally ad hoc in design, that unsubstantiated opinions are often treated as facts, and that such studies and the data contained therein are an unreliable basis for policy formulation.

Mindful of these criticisms, the aim of this study was to determine if counterfeit pesticides pose a substantive threat to the UK agricultural industry. This to be achieved by addressing the following consecutive objectives:

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

A fourth and final study objective was contingent upon it being found that, in light of the first three objectives, there was sufficient evidence to conclude that there is a substantive threat. This was to make recommendations to reduce the risk posed to the UK agricultural industry by counterfeit pesticides. This final recommendation reflected the overall ethos of this study; that it should be a pragmatic rather than a purely theoretical consideration of a potentially significant crime problem.

METHODOLOGY

The IPO investigation into the efficacy of counterfeiting research may have been critical of contemporary counterfeiting research but



it was not entirely negative for it proffered an alternative methodology based upon a more eclectic attitude toward evidence gathering. It suggested that taking a broader approach to data gathering can produce a more reliable picture of the problem, at least when compared to that which may be achieved by a single-strand study (Collopy et al., 2014). However, whilst endorsing this more encompassing approach to counterfeiting research the report also concluded that there is no formulaic 'one size fits all' set of methods for assessing the counterfeit threat across all business sectors. That said it did propose 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 (¹). In research terms this 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 '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' was adopted (Creswell and Clark, 2011, p. 2). As Creswell and Clark (2011, p. 8) suggest this is an appropriate approach to research when 'one data source may be insufficient'. Moreover whilst qualitative and quantitative studies each have their own limitations, the drawbacks of quantitative research in this context being widely acknowledged (see for example Fink et al., 2010), in combination they can 'provide a more complete understanding of the research problem than either approach by itself' (Creswell and Clark, 2011, p. 8). Essentially each offsets the weaknesses inherent to the other. These features very neatly reflect the IPO study findings, however, 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).

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 were 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 relevant for it could not be anticipated from which research strand significant findings would emerge. The study therefore afforded equal priority to each strand;
- iii. *Determining the timing of the quantitative and qualitative strands* — the temporal relationship between the two in terms of data collection. In this study concurrent timing was appropriate because this enhanced the likelihood of early cross-fertilisation across strands 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. Given that these software packages do not facilitate the real-time merger of the data they produce pragmatically this had to occur after separate analysis but before overall interpretation of the results.

(¹) In recommending a blended approach to research the IPO also advocated what might be described as quality assurance framework suggesting 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 remained an aspiration being essentially beyond the scope of a stand-alone study.



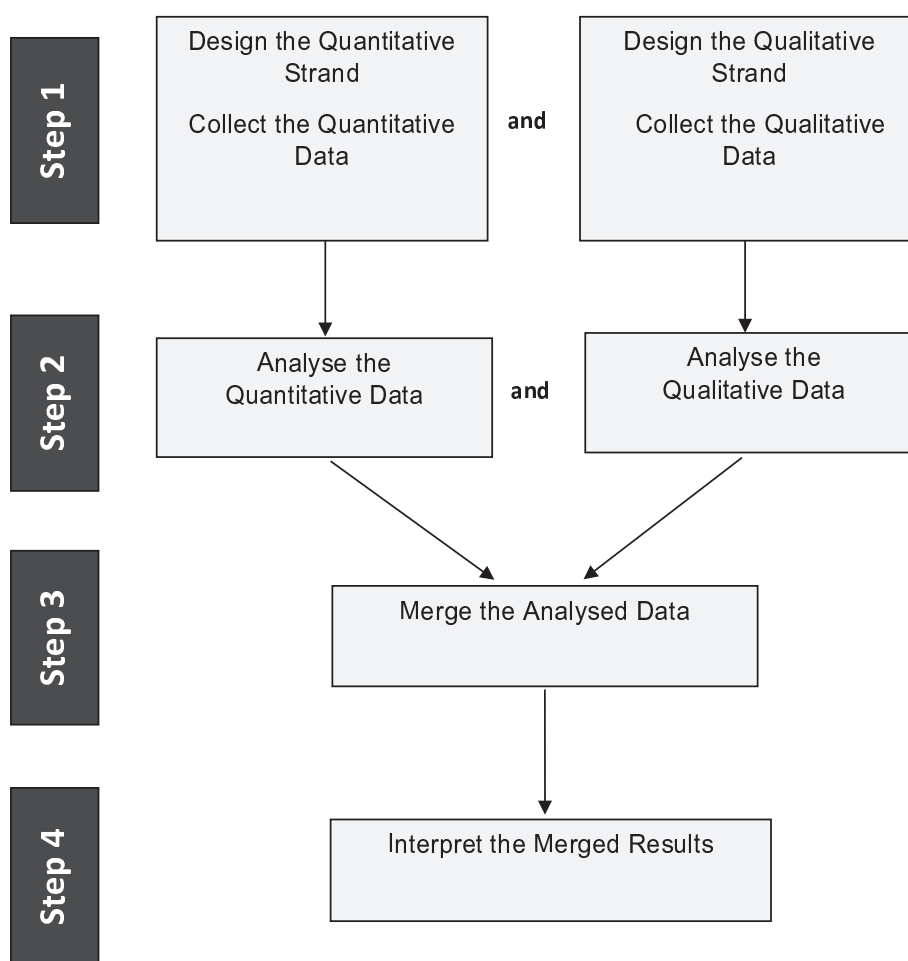
On overlaying these key decisions onto the six common mixed method study designs described by Creswell and Clark (2011, pp. 69-72) the one that best reflected the interaction, priority, timing and mixing requirements of this study was a Convergent Parallel Design. This design follows a distinct four-step process, as shown in Figure 1, which involves the concurrent collection of quantitative and qualitative data with the two sets of results then being independently analysed before being merged into an overall interpretation. 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 and Clark, 2011, p. 77). As a design it is recognised as having a number of advantages, most notably that it is efficient. That

data is collected during a single phase of study makes intuitive sense when considering a rapidly evolving crime problem.

In designing an approach to the research based on the prototypical convergent parallel method described above foremost in mind was that the research should span the subject categories that the IPO report would suggest are significant stakeholders in the UK counterfeit pesticide problem ⁽²⁾:

- i. Manufacturing industry victims;
- ii. Consumers and other businesses and organisations operating within the market;
- iii. Enforcement agencies.

Figure 1: Flowchart showing the procedural steps in implementing a convergent parallel research design. Adapted from Creswell and Clark (2011, p. 79).



⁽²⁾ These subject categories were intended to reflect, so far as was possible within the context of this particular counterfeiting problem, the IPO recommendation that evidence should be gathered from victims, consumers and relevant government departments.



The data collection methods employed took account of the knowledge and concerns of these three stakeholder groups and may be summarised as follows:

- In the qualitative strand a series of stakeholder in-depth interviews and Freedom of Information Act (FOIA) requests to police forces sought to understand firstly the nature of the crime and how it manifests itself in the UK setting and secondly if rural policing strategies/policies address this particular crime problem. A case study of an incident involving a counterfeit pesticide was also included in this strand and was subsequently used to illustrate the interpretative step in the convergent parallel design;
- The quantitative strand made use of a large scale closed-question survey of police staff, pesticide users, and members of the public and a word frequency analysis of national and local online reporting of rural crime over a 12-month period. Together they demonstrated the relative levels of subject awareness amongst police officers in areas with a significant farming community and, having shown that this was no better than a control sample drawn from the general public with no knowledge of the commercial use of pesticides, to ascertain where rural policing is actually focused. In addition, and by way of a quantitative FOIA request, this strand also considered if, in the data held by public bodies with an enforcement interest in the problem, there is indication of patterns or trends in the occurrence of counterfeit pesticides in the UK.

When merged, the data derived from these various strands of research produced a richer picture of the counterfeiting problem than the IPO blended approach suggested was possible.

RESULTS

From the outset this study had one overarching concern: 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 and it would be fair to say that the review found that it had, at least so far as industry generated material and associated media coverage described the *mechanics* of the crime. This grey literature recognised China as being the primary source of counterfeit pesticides, that the trade is dominated by the activities of OCGs and is intrinsically associated with an abuse of parallel trading rules, and that the problem is at its most serious at the eastern periphery of Europe. These characteristics of the problem were further evidenced by the research, however, what was also shown was that whilst the literature captures the mechanics it fails to appreciate the *dynamics* of the problem and specifically the three distinct sources of influence which collectively shape the UK counterfeit pesticide problem:

- The diverse profile of the UK pesticide marketplace. There is an underlying baseline market for counterfeit pesticides that resides in a comparatively poorly regulated market outside of the core agricultural industry;
- 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;
- The narrow focus of rural policing, the results of the study suggesting that this is the consequence of an actuarial influence ⁽³⁾.

Whilst these three sources of influence were deemed to be of equal importance in the overall shaping process it is the final one that is the concern of the remainder of this paper.

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 where this is put into practice. Within the police force that was the primary subject of the study there was an open acknowledgement that there already was, and would be an increasing tendency toward, aligning measures of rural policing success to crime data produced by a leading UK farm insurer. Moreover, across the other UK police forces with a

⁽³⁾ Actuarialism, in this context, may be regarded as being the use of statistical rather than clinical methods to predict criminal behaviour and to administer a criminal justice outcome.



significant rural policing responsibility the results of the FOIA requests demonstrated a marked strategic emphasis on the management of theft from farms over and above any other form of rural offending. These results were supported by data gathered from the word frequency analysis which showed that, over a 12-month period, online reporting of rural policing had a similar emphasis on tackling theft from farms. This narrow focus may well be the defining feature of contemporary rural policing, at least in terms of understanding the police response to OCG-sponsored, technology-based crimes such as the counterfeiting of pesticides. It was at this point that the study turned to the theorising of Bernard E. Harcourt as a means of interpreting what the consequences of this policing focus might be.

DISCUSSION

In his wide ranging criticism of the use of predictive methods in policing, Harcourt proposes three reasons why we should be sceptical of the value of actuarial practices in the criminal justice setting (Harcourt, 2006). 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, were of limited interest and relevance to this study. Harcourt acknowledges that not all of his criticisms will be persuasive in every context, however, a third criticism was 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 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, p. 23). In the context of this study this hypothesis gives rise to a relatively simple notion; if the police focus their attention and resources on those responsible for theft from farms, and this

group do not respond as anticipated, then not only will this crime not be reduced but they will inadvertently create opportunity for those who deal in counterfeit pesticides to engage in their chosen form of criminality relatively unhindered. As a consequence overall rural crime may well increase. This of course renders Harcourt's criticism of actuarial practice highly pertinent in the context of this study if, within any given policing area, OCGs 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.

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 significant that the literature indicates that large scale counterfeiting is almost exclusively the domain of organised criminality, and that OCGs are characterised by their opportunistic and entrepreneurial nature. It might 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.

Harcourt's paradigm would also presume that the criminals behind the counterfeit pesticide problem are not the same ones who are responsible for stealing high value items from farms, and indeed the results of the research would suggest that this is the case. The study found that the trade in illicit pesticides is concentrated on a relatively small group of highly specialised criminals and it seems unlikely that the ostensibly legitimate companies under the guise of which they operate would be sufficiently diverse to also be involved in stealing plants and machinery. On the other hand whilst it is conceivably possible that those responsible for theft from farms are also involved in the trade in counterfeit pesticides this also seems unlikely given the highly technical nature of the crime.

Central to the paradigm is 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. Having determined that the elasticity of OCG counterfeiting groups is probably high, data published by a leading farm insurer would suggest that the response of those that steal from farms



to the sustained police focus on their activities is not what might have been anticipated. The NFU Rural Crime Survey (NFU Mutual, 2015) indicated that theft of some farm items, notably machinery and quad bikes, had remained static over the preceding 12-month period whilst other theft, including tractors and trailers, had actually slightly 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 in practice determining the relative elasticity of offending between these two groups is bound to be an inexact science, not least because finding or producing robust data on pesticide counterfeiting activity is, as with all counterfeiting problems, inherently problematic. Nonetheless some assumptions have been made based on what was found both in the literature review and the results of the research. The literature suggests that counterfeiting 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. The results of this research indicate that this is certainly the case with regard to the UK pesticide market. This would suggest a relatively high elasticity of offending, at least when compared to those upon whom the current rural policing focus falls.

The implications of this are perhaps obvious, but nonetheless of considerable consequence if 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 result of the police rural crime focus being other than

on them and their illicit activity. If this proves to be the case then Harcourt's paradigm would suggest then that the predominance of theft from farms in rural policing policy and practice may, as a consequence, have unduly exposed the UK farming industry to the threat posed by counterfeit pesticides.

CONCLUSION

Taking the results of the research as a whole the data indicated that counterfeit products are a chronic feature of the UK pesticide marketplace, albeit the extent to which they are present at any point in time is, and is likely to remain, a matter of conjecture. Whether this should be considered to be a substantive threat to the agricultural industry, that is to say something that can exploit vulnerability and, in doing so, cause harm, is probably more certain. That the police, the primary agency responsible for tackling OCG criminal activity, have failed to engage with this crime at a local level exposes the industry to the repeated incursion of counterfeit products. Moreover the current dominant actuarial influence over rural policing strategy and practice means that the problem is unlikely to become a local police priority in the foreseeable future and so that threat will persist.

The study continues by addressing the fourth and final objective, drawing upon the results of the research to develop evidence-based strategies which may disrupt the market dynamic thus mitigating the threat posed to the UK agricultural industry by counterfeit pesticides.

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