

## **SESSION 3A**

# **WHO CONTROLS CROP PROTECTION PROGRAMMES?**

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Papers: 3A-1 to 3A-4

**Meeting consumer demands for food safety: European retailer protocols for crop protection programmes**

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**ABSTRACT**

Consumers across Europe have high expectations about the safety of their food and many are concerned about the environmental and animal welfare implications of the way their food is produced.

The Euro-Retailer Produce Working Group, or EUREP for short, is a technical working party which promotes and encourages best agricultural practice in the fruit and vegetable production industry. EUREP represents leading European food retailers.

EUREP seeks to respond to consumer concerns by developing Good Agricultural Practice (GAP) frameworks for benchmarking existing ICM schemes and standards, including traceability. It is establishing a single recognised framework for independent verification.

The first draft EUREP Good Agricultural Practice protocol was agreed in November 1997. Pilot schemes were done on farms to see if the EUREP GAP could be implemented in the field. Reports highlighted those areas requiring further improvements but overall improvement in compliance was significant and constant on all farms. This demonstrates that the GAP protocol is capable of bringing about continuous improvement.

Lessons from the trials have been incorporated into the current version of the EUREP GAP protocol. The protocol deals with all aspects of production. A traceability project is being co-ordinated by EAN-International with the help of national numbering organisations. The introduction of an independent verification is imminent.

**CONSUMER CONCERNS**

Consumers across Europe have high expectations about the safety of their food and many are concerned about the environmental and animal welfare implications of the way their food is produced.

These concerns have been fuelled by food scares including BSE and, more recently, the dioxin scandals. Into this heady brew have also come genetically modified crops.

If the food industry is to meet its customers concerns head on, it must not only be confident that produce is being grown according to best practice, but it must also be able to prove that best practice has been followed.

## INTRODUCING EUREP

The Euro-Retailer Produce Working Group, or EUREP for short, is a technical working party which promotes and encourages best agricultural practice in the fruit and vegetable production industry. It was officially established in 1997 when the Cologne-based EHI-EuroHandelinstitut was able to provide a permanent Secretariat. It grew out of an informal grouping first established in 1996 and is a logical extension of the various national traceability and producer protocol initiatives.

## MEMBERS OF EUREP

EUREP represents leading European food retailers, (see table 1). In addition to the retail members there is a growing group of associate members who support the idea and assist in drafting the proposals for the continuous improvement of the protocol framework.

Table 1. Current membership of EUREP

Contact	Company	Country
Willem Hofmans	Albert Heijn Belgian Wholesale Markets	Netherlands
Pascall Pélon	Continent	France
Giuseppe Candini	Coop Italia	Italy
Jacinto Palma Dias	Delhaize "Le Lion",	Belgium
Peter Hostens	GB Cabbac	Belgium
Géraldine Thiriot	Groupe Promodès	France
Björn Hacklou	ICA	Sweden
Jari Simolin	Kesko	Finland
Roger Jerlbäck	Kooperativa Förbundet	Sweden
Nigel Garbutt	Safeway,	UK
Denise Field	Sainsbury's	UK
Herbert Wandl	Spar-Österreich	Austria
George Marston	Tesco,	UK
John Foley	Waitrose	UK

## AIMS AND OBJECTIVES

EUREP seeks to respond to consumer concerns about food safety, environmental protection and worker welfare by:

- Encouraging adoption of commercially viable Integrated Crop Management (ICM) schemes for fresh produce which promote the minimisation of agrochemical inputs within Europe and world-wide;

- Developing Good Agricultural Practice (GAP) framework for benchmarking existing ICM schemes and standards including traceability;
- Providing guidance for continuous improvement and the development and understanding of best practice;
- Establishing a single recognised framework for independent verification;
- Communicating and consulting openly with consumers and key partners, including producers, exporters and importers.

## **PROGRESS TO DATE**

The first draft EUREP Good Agricultural Practice protocol, (known as EUREP GAP) was agreed in November 1997. In September of the following year pilot trials were begun with producers in Spain and Italy to test three things:

1. Could the EUREP GAP be implemented in the field?
2. Was it possible to verify the protocol in the field?
3. What costs were associated with the system?

The results highlighted the importance of convincing growers of the advantages of each point on the protocol. 'Advanced' farms with qualified owners had no problem implementing the GAP. Indeed many of the requirements had already been practised for many years. Small farms however often needed more time and assistance to adapt to new methods of production. Nevertheless improvements were evident on all farms involved. Indeed, the greatest rate of improvement occurred during the first half of the project proving that many parts of the GAP protocol can be implemented relatively quickly.

Visits by the verifiers during the season allowed progress to be monitored and measured. Reports highlighted those areas requiring further improvements and overall improvement in compliance was significant and constant on all farms demonstrating that the GAP protocol is capable of bringing about continuous improvement.

Improvements in farm operating practices were found to increase cost efficiencies in the mid to long term although in the initial stages investment may be required to upgrade facilities and train staff, for example.

Lessons from the trials have been incorporated into the current version of the EUREP GAP protocol. The protocol deals with all aspects of production (see Table 2).

EUREP members have also been addressing the need for a standardised traceability scheme which will allow identification of sources of contamination and also differentiate EUREP GAP production from other produce. A traceability project is being co-ordinated by EAN-International with the help of national numbering organisations. EAN International, originally the European Article Numbering Association, was created in 1977 as a non profit body with the task of setting up a European numbering system compatible with the US Uniform Code Council's system. The resulting EAN-UCC system is now used by over 800,000 companies world-wide. EAN International is now working on a global Fresh Produce Traceability Project and is expected to put forward its proposals to EUREP by the end of this year.

Table 2. A cross-section of the topics covered by the EUREP GAP protocol

A cross-section of the topics covered by the EUREP GAP protocol		
• record keeping;	• storage of fertilisers and pesticides;	• empty pesticide containers;
• choice of variety;	• use of organic manures;	• harvesting hygiene;
• seed treatments;	• irrigation;	• post harvest chemicals;
• nursery stock;	• choice of crop protection products;	• post-harvest washing;
• site history;	• safety training and instructions;	• waste and pollution management;
• rotations;	• protective clothing pre-harvest intervals;	• worker health, safety and welfare;
• soil type;	• spray equipment;	• the impact of the farming on the environment;
• cultivation techniques	• disposal of surplus spray;	• wildlife and conservation.
• soil erosion;	• residue analysis;	
• fumigation;		
• advice, timing and frequency of fertiliser application;		

EUREP has also been active on the information front, setting up a Web site at [www.ehi.org](http://www.ehi.org) and producing information sheets and a comprehensive book describing ICM in Europe.

## THE FUTURE

The introduction of an independent verification is imminent. Independent verification by recognised organisations is essential since it is the best way that consumer credibility can be sustained and increased. Such an independent system will also help to guarantee transparency – an important factor in the industry's relationship with the media and Non-Governmental Organisations (NGOs), such as Greenpeace and Friends of the Earth.

It is already evident too that independent verification is likely to play a major role in the overhaul of European Food Standards legislation. The Commission will be seeking to establish a level playing field for all market participants at the same time as introducing field to table controls to pre-empt food safety scares.

But food safety and within that concerns about pesticide residues look set to remain high on consumers' agendas. NGOs and the media will continue to sensitise consumers to these issues and there is likely to be an increased focus by regulatory authorities on residue minimisation.

Further refinements of the EUREP Protocol and the imminent launch of the independent verification procedures provide us with an opportunity to grab the initiative. By signing up to the process of continuous improvement, producers will always be in a position to be able to prove that best practice has been followed.

**The commercial implications of UK and EU Maximum Residue Levels: the fresh produce supplier's view**

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**ABSTRACT**

This presentation outlines the issues around Maximum Residue Limit (MRL) legislation and the effect this has on businesses that market produce in the UK. It examines the implications of these legislative standards and how a company, such as Geest plc, that procures produce from around the world, deals with them.

**THE BUSINESS DRIVERS**

The press and consumers see the presence of pesticide residues as a potential food safety risk as recent press articles show.

One of the main drivers that influences how growers, wholesalers, processors and retailers approach the MRL legislation, is the requirement that produce (marketed as whole product, dried, frozen or processed) must not have an MRL that exceeds the current UK or EU MRL legislation. There is a comprehensive and complex set of legislative controls on pesticide usage and pesticide residue levels (see Table 1).

The regulatory authorities, such as the UK's Pesticides Safety Directorate (PSD), will fully enforce this legislation and carry out routine residue screening to monitor the pesticide residues present in produce. If a product has a residue in excess of the defined MRL or has evidence of use of a non-approved product, the suppliers will:

- 1 Have the consignment rendered unfit for market and hence must be destroyed;
- 2 Be 'named and shamed' in the annual report of the UK government's Working Party on Pesticide Residues, which is released to the press. The headlines can have a significant effect on a slow news day;
- 3 Be required by PSD, in a due diligence defence, to show they have carried out all the appropriate steps.
- 4 Be prosecuted under Food Safety Legislation if they have not carried out all the appropriate steps or the residue level was extremely high or there was evidence of an illegal, non-approved use of a product.

The most serious effect of these actions is on the supplier's market; their customers – the retailers – may question their technical competence to supply and cancel contracts as a result.

Any supplier, where a residue is greater than the defined MRL, has the defence of due diligence. This is available under UK food legislation. Simply put, the supplier has to prove that they took all reasonable precautions on products entering the food chain.

What is reasonable is based, in general terms, on the size of the business, the volume of a specific item of produce handled and the size of the market (the potential number of consumers affected). The level of expertise and time put in by a small trader cannot be expected to match a major supplier of the multiple retailers.

Geest, of which Bourne Salads is part, fits into the upper end of the spectrum, supplying huge volumes of unprocessed and processed produce to all the major multiples in the UK

Geest started life as a bulb trading business, selling Dutch bulbs in the UK before it developed into farming, wholesale markets, prepacking and bananas. The main focus of the business today is the manufacturer of short shelf-life, prepared products in the UK and Europe

The products marketed by Geest and associated companies range from traded products such as grapes and tomatoes, through to prepared products – bagged salads, stir-fry vegetables to pizzas, fresh pasta, soups and so on. These are supplied to all the major retailers in the UK and are consumed by millions of people every day within the UK (up to 20% of UK population weekly).

## **HOW DO WE ENSURE THAT THE RISK OF MRL NON-COMPLIANCE IS AS LOW AS POSSIBLE?**

The starting point is to know and understand the supply base and develop a good relationship with your supplier to ensure they understand the issues affecting the UK and the European market place. We also need to ensure that we understand the environment and conditions they are working in.

Products are sourced from programmed growers (with fixed prices and volumes), throughout the year. They are all approved and part of the approved supplier database.

### **Approval process**

All suppliers complete and return a warranty statement, based on the guidelines laid down by the UK's Fresh Produce Consortium (FPC), along with a declared list of the pesticides they are likely to use on the crop. This list is of the products that may be used by the grower and are approved for use on the crop in the country of origin. Where there is no approval procedures in the country of production, approvals can be extrapolated from the nearest country with a similar climate and which has a recognised approval scheme. This is based on the Guidelines developed by the FPC.

This information is gathered for each supplier prior to the beginning of each season and checked for the following: -

- 1 Are the products approved in the country of origin? If this data is not readily available, the supplier must provide evidence of approval status;

- 2 Are any of the products on UK or EU banned or restricted lists? Are they restricted by retailer protocols, for example? No product on these lists is accepted for use on products marketed in the UK;
- 3 Are any of the MRLs of these products set at the Level of Determination (LOD) under the EU MRL review 91/414?

Some pesticides have the MRL set at LOD by the manufacturer because, by following Good Agricultural Practice, there is no identifiable residue present. Where the MRL is set by the EU at LOD by default, due to lack of safety data, any use is likely to result in a possible MRL non-compliance. Once a MRL is set at LOD, it is incumbent on each member state to check that the approved uses of this product will not result in illegal residue levels. In reality this means that, in most cases, the use of the product on the crop will be revoked by each state.

Countries outside the EU will continue using these pesticides and hence have a significant risk of MRL non-compliance if they are marketed in the UK. The UK legislative authorities actively monitor and prosecute any non-compliance. The retailers and consumer organisations all monitor residues in produce on an on-going basis.

From my point of view any pesticide with an MRL set at LOD is dangerous and is not acceptable unless the supplier can prove to me that there is absolutely no risk.

On an annual basis, all suppliers are audited by Geest technologists in many areas of operation but with a particular focus on pesticide usage, controls and recording.

We also positively encourage and aid suppliers to identify and adopt the best Crop Protocols available. In the UK, all suppliers must be registered with and be audited against the Assured Produce protocols. These provide the base minimum standards for suppliers to Geest. In other European countries the development of EUREP crop protocols provides a good minimum standard for suppliers and we encourage our supply base to adopt it. This is not the only protocol available; in Spain others have been developed by organisations such as Aenor for lettuce etc. There are also protocols set by individual retailers, such as Tesco's Nature's Choice. Geest is not prescriptive on which protocols are adopted and encourages suppliers to adopt the most appropriate .

### **Pesticide Residue Analysis**

To check that suppliers are doing what they say they are, each factory has a schedule of residue analysis. Throughout the year samples are taken and sent to labs for multi-screen analysis. Geest spends about £100,000 a year on pesticide residue screening.

The results of the residue screening are looked at in a number of ways:

- No identifiable residues;
- Residues within MRL;
- Are pesticides identified on the approved list provided by the supplier?
- MRL non-compliance.



It takes considerable time and expertise to carry out this level of residue work, which many smaller companies cannot afford. But, whatever size of the business and resources available, the same legislation is in force for product marketed in the UK. Under the UK Food Safety Legislation anyone marketing in the UK must take all reasonable precautions under the Due Diligence Defence to ensure product entering the food chain is fit for the purpose intended.

## RECENT ISSUES

One incident in 1999 demonstrates how difficult it is to control this situation. It involved the use of methamidophos in peppers. In October and November 1999 illegal levels of methamidophos residues were identified in peppers imported from Spain during routine screening work in Scandinavia. The MRL for this pesticide was set at LOD at an arbitrary date in the summer 1999. Use of methamidophos would inevitably result in an illegal MRL if it was used after this date. But what about produce treated prior to this date – it was legally treated but possibly illegal to market. On checking with PSD, it transpired they would 'name and shame' any supplier identified as marketing a residue above the MRL – a guaranteed story for the media – but they may not be prosecuted if they could prove the application was carried out prior to the change in the legislation. What about frozen product which has been in store for three or four years?

## THE FUTURE

This is not going to get easier, as more restrictions on pesticide residue levels and the review of active ingredients go through European Commission. It is difficult enough to keep up to date with these continual changes in the UK and Europe but how suppliers outside Europe are expected to keep up to date on the changes and how these will adversely affect their markets is difficult to see.

## APPENDIX 1

### UK legislation

#### 1 Main legislative controls on pesticides

##### Food and Environment Protection Act 1985 (FEPA)

*Part III of this Act gives Ministers the power to make Regulations to control the import, sale, supply, storage, use and advertisement of pesticides.*

##### Control of Pesticides Regulations 1986 (COPR)

*These Regulations implement part III of the Food and Environment Protection Act 1985, and impose controls on those who sell, store and use pesticides, requiring the certification of certain groups.*

##### Plant Protection Products Regulations 1995

The Pesticides (Maximum Residue Levels in Crops, Food and Feedingstuffs) Regulations 1994 and subsequent amendments  
*Made under the European Communities Act (1972) and the Food and Environment Protection Act 1985, they set maximum residue levels for specified active ingredients and define powers to seize and dispose of food having residues in excess of the maximum level.*

The Food Safety Act 1990  
*The Act sets standards for food quality and the process of enforcement.*

## 2 Other legislation controlling pesticides

The Plant Protection Products (Fees) Regulations 1995  
Control of Pesticides (Amendment) Regulations 1997  
Plant Protection Products (Basic Conditions) Regulations 1997  
Plant Protection Products (Amendment) Regulations 1997  
The Plant Protection Products (Fees) (Amendment) Regulations 1997  
The Pesticides Act 1998  
The Patents (Supplementary Protection Certificate for Plant Protection Products) Regulations 1996 and the Patents (Supplementary Protection Certificates) Rules 1997  
Producer Responsibility Obligations (Packaging Waste) Regulations 1997  
Health and Safety at Work etc Act 1974  
The Control of Substances Hazardous to Health Regulations 1994 (COSHH)  
Management of Health and Safety at Work Regulations 1994  
The Code of Practice for the Safe Use of Pesticides on Farms and Holdings (The Green Code) (revised 1998)  
The Code of Practice for Suppliers of Pesticides to Agriculture, Horticulture and Forestry (The Yellow Code) (revised 1998)  
The Codes of Good Agricultural Practice — Soil, Water and Air  
The Control of Major Hazards Regulations (COMAH) 1999  
Health and Safety - The Carriage of Dangerous Goods (Classification, Packaging And Labelling) and Use of Transportable Pressure Receptacles Regulations 1996 (CDG-CPL)  
Health and Safety - The Carriage of Dangerous Goods by Road Regulations 1996 (CDG-Road)  
Health and Safety - The Carriage of Dangerous Goods by Road (Driver Training) Regulations 1996 (DTR)  
Health and Safety - The Transport of Dangerous Goods (Safety Advisers) Regulations 1999  
Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP 2) as amended  
The Water Act 1989  
The Water Industry Act 1991  
The Water Resources Act 1991  
The Control of Pollution Act 1974  
The Control of Pollution (Amendment) Act 1989  
The Environmental Protection Act 1990  
Wildlife and Countryside Act 1981  
The Animal (Cruel Poisons) Act 1962  
The Animals (Scientific Procedures) Act 1986

Farm and Garden Chemicals Act 1967  
Pesticides (Fees and Enforcement) Act 1989  
Medicines Act 1968  
Poisons Act 1972  
The Highly Flammable Liquids and Liquefied Gases Regulations 1972  
The Air Navigation Order (No 2) 1995 and the Rules of the Air and Air  
Traffic Control Regulations 1974  
Consumer Protection Act 1987  
Supply of Goods Act 1979

**Working within food assurance protocols; current farm practice in the UK**

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**ABSTRACT**

Governments want pesticide reduction, environmental protection and public safety. Retailers want minimum pesticide residues, consistent supplies, high quality, zero pest contamination and low prices. Consumers want freshness, quality, availability, shelf life, a wide range and no wildlife in the produce. Lobby groups want no GMOs, no pesticides, organic cropping and minimum 'food miles'.

As an agronomist I am involved in advising UK vegetable growers on how to meet all these demands, including the best crop protection practices. The position of the field vegetables sector is similar to that of other sectors of UK crop production and is likely to apply in other parts of the world in the near future.

This paper describes the practical processes involved in assessing potential problems, those for preventing or delaying them and, if necessary, intervention. All decisions are made in the context of Integrated Crop Management.

**WHO CONTROLS CROP PROTECTION PROGRAMMES?**

There are two levels of control – the "fine" control of decisions on what, when and how to treat crops in the field and the "coarse" control of which products are allowed to be used in a particular situation.

Between 1965 and 1995, the main provider of information on pesticides – and hence the main influence on the fine control of their use – moved from agrochemical manufacturers, through distributors to farmers. In that same period, consumers, retailers, lobby groups and government have taken a greater interest in such issues, and much stronger restrictions have been imposed on which pesticides may be used.

Since 1995, however, the UK field vegetables sector has seen some reversal of this trend. Such a wide range of issues must now be considered when any crop protection decision is made that farmers increasingly seek specialist advice. This advice must comply with legislative, technical and consumer control pressures.

There are signs that this same trend is affecting other sectors of UK agriculture and horticulture. The increasing internationalisation of retail trade means that the UK is not the only country affected in this way.

## **CONTROL PRESSURES: THE VIEW FROM THE FIELD**

The government wants pesticide reduction, environmental protection and public safety. This includes both legal restrictions on pesticide use and pressures on the industry to move beyond mere compliance with the law.

Farmers want reliably high quality yields, satisfied customers and minimum expenditure on all inputs.

Retailers want minimum pesticide residues, consistent supplies, high quality, zero pest contamination and low prices.

Consumers want freshness, quality, availability, shelf life, a wide range and no wildlife in the produce. Lobby groups want no genetic modification, no pesticides, organic production and minimum food miles.

Any decision on pesticide use must be made within the context of ICM and yet take all these pressures into account.

## **THE CHANGING ROLE OF THE AGRONOMIST**

The average size of farms in the UK has been rising for many years. The latest statistics show that, at 68.9 ha, the average UK farm size is more than twice that in any other EU member state and nearly four times the EU overall average farm size of 18 ha. As the proportion of large units has increased, the technical competence of their staff has also increased.

Within the fresh produce sector, this trend was suddenly advanced in 1997 with the introduction of the Assured Produce verification scheme. Verifiers now visit all larger fresh produce suppliers on a regular basis to audit all aspects of the crop protection process. The need to ensure compliance with this system means that all such farms now employ staff with formal training and qualification in crop protection issues. In some cases these staff are employed only within the quality control department; in others they are responsible for crop agronomy.

Supermarkets and processors now demand clear evidence of traceability, legality and justification for pesticide use. This has not demanded radically new techniques, but has brought all suppliers up to the level of the best suppliers.

Today's agronomists are closely involved in keeping their clients up with the best performers. This has seen a considerable change on farms in the way advice is offered and followed.

In the early days of widespread agrochemical use, farmers gained most of their information directly from manufacturers. Agrochemical distributors made their profits by acting primarily as an efficient means of delivering chemicals onto farms. During the 1970s and 1980s, distributors became the major source of information for farmers. They took on technically qualified staff and gained profits by using their knowledge to influence the farmer's choice of chemical by giving prescriptive recommendations.

The changes in farm size and staff discussed earlier mean that the distributor agronomists no longer have the monopoly on information. Many of their customers are now equally well informed about both pests and pesticides. Until fairly recently it was possible – and in many cases, normal – for an agronomist to follow a blueprint approach. "Problem A on crop B means product C at rate D, the harvest interval will be E and the price will be F." Provision of this information was enough to command a margin on the chemical. This is no longer the case – farmers are now well informed about all these points.

The same technical farm staff who have this information are, however, also better informed about the difficulties of protecting the yields and quality of their crops in ways acceptable to their customers. Their problem is that their time is spread over many areas of their business and they often struggle to obtain training updates on crop protection issues. They are therefore more willing to pay for quality advice and can make decisions on which agronomy services are better provided either "in house" or bought in.

The role of the agronomist has now moved towards a partnership with the growers they advise. Agronomists must understand their business requirements and act as if they were a part of that business. They are now less a source of data, but more a source of knowledge and interpretation of data.

## **PRACTICAL TECHNIQUES OF CROP PROTECTION**

The principles of Integrated Crop Management (ICM) are now well established, though the practical implementation of some parts of the standard process is less simple than it may appear. The process involves assessing potential problems, prevention or delay of problems, monitoring and, if necessary, intervention. Each of these stages includes a range of possibilities, details of which will be discussed.

When I walk into a field, I usually know its history of cropping and problems. I know what pests or diseases are affecting other crops in the area and what trends are showing in their populations and those of any beneficial insects that may affect them. I may have information from computer-based predictions of pests or diseases, or from insect traps in this or nearby crops. I am aware of the theory behind various models of pest or disease development, including some not yet available as commercial prediction systems.

I know what problems could potentially affect this crop, what its varietal susceptibility to those problems is and what problems have already been seen on it. Where relevant, I will be aware of potential pesticide-resistance problems and the likely risk of such problems in this locality. I know the likely pattern of infection of different pests and diseases (patches or even distribution). I will be aware of the expected harvest date and of the quality demands of the market for which the crop is intended.

I will know – or be able to quickly check – what pesticides are legal for use on this crop, along with all the restrictions on their use. I know how effective they are likely to be against the range of possible problems, along with any adverse environmental effects they may have including effects on beneficial species, whether native or introduced. I will be aware of the current and forecast weather conditions and the impact of these on likely pest and disease

species, beneficial species and on pesticide performance

The techniques of effective crop-walking are well known. As I start to inspect a crop, I initially look for variations which might indicate problems. Differences in size, colour, density or growth habit of the crop could indicate either the existence of a problem or an increased risk of problems developing. I try to cover any such areas whilst walking across the field, but I am mostly looking at plants immediately in front of me. Some pests and diseases are immediately obvious, but others require closer inspection. Even those that produce obvious symptoms may be difficult to detect at early stages of development. Apart from evidence of pests, diseases or weeds, I also look for signs of increased susceptibility (such as unusually soft growth) or of beneficial organisms (hoverflies, parasitic wasps etc). I look for any signs of nutrient deficiency or of need for other management inputs such as irrigation or cultivations.

When I find one problem requiring treatment, it is very important not to stop considering other possible problems, as it is fairly normal for several to require treatment together. Treatment for one problem will affect other problems and may also affect the options available for other treatment. I have to keep an open mind – it is very risky to make assumptions about what will or will not be there. Much of the crop inspection process depends more on intuition than on any standardised system.

The decision on whether or not to treat a particular problem depends on extrapolating forward in time the possible outcomes of treatment or no treatment. Low levels of pest or disease often do not justify treatment – I point them out to the grower and note the need to monitor them on subsequent visits. If, however, the crop is approaching the last possible timing for an effective treatment, it is not practical to delay a decision until later. I am not yet convinced of the ability of any computer based systems to get this decision right. Although some decision support systems may help, this seems to me to be an area where human intervention is essential. Once a treatment has been applied, it is still necessary to monitor the situation, as few pesticides are 100% effective in field situations.

The decision to apply a pesticide is the end of one process, but the start of another. When I recommend treatment, I have to ensure that the farmer is aware of all the relevant conditions of use. These include dose rate, harvest interval, water volume, whether the approval is based on a label or a Specific Off Label Approval, any buffer-zone requirements near watercourses, adjuvants that may be necessary, tank mixing restrictions etc.

I have to leave a written record of my recommendation that clearly identifies the field, crop and, where appropriate, planting or drilling number. It must give details of the recommended treatment and of the justification for the recommendation. The farmer must keep records of these details and must also comply with additional legislation relating to the spray operation. Once the crop is harvested, he must be able to trace back all the treatments used and demonstrate that such use was legal and justified.

Evidence that the grower, with the benefit of expert advice, has responded in a responsible and rational sequence of decisions and actions is crucial if that grower is to remain a supplier to today's retail trade in the UK.

**The implications of food assurance schemes for the pesticide manufacturer**

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**ABSTRACT**

In recognising that consumers can have a powerful effect on the European food industry, it becomes important for the pesticide industry to adopt an understanding and empathetic response to consumer concerns and the food chain in its business processes. This paper examines the current demands on the pesticide industry as it comes under new market-driven rather than regulatory scrutiny on the safety of its products.

**BACKGROUND TO THE UK AND EUROPEAN MARKET**

Pesticide use in the UK and across the rest of Europe is currently evolving through one of its greatest periods of change of the past fifty years. At the heart of the change is the steady reversal of the technical decision-making on agrochemical usage, from that based on efficacy and cost of product, to one that stems from pressure applied by consumers taking an ever greater interest in how food is produced. In the UK the speed of this change and the impact of the change has been accelerated by retailers keen to promote themselves as the consumers' champion.

Consumers have convincingly demonstrated their power through the virtual eradication of genetically modified crop ingredients from foods. The arrival of genetically modified crop food ingredients in Europe had met with a degree of support from the public with the introduction and sale of puree made from genetically modified tomatoes. However, once the sudden widespread use of genetically modified soya beans and maize began as an ingredient in a wide range of processed and prepared foods, consumers, aided by campaign groups, started to question "what is going on with our food?"

The biotechnology companies with their agrochemical background had readily understood the farmer benefits that could be conferred with herbicide-tolerant, insect-resistant and fungal-resistant crops on farming practice. Farmers in the USA and Canada had found new freedoms with reduced tillage and new pesticide choices available to tackle the pest problems. Alarm bells sounded, however, for American farmers when Europe started to reject such crops, the result of widespread consumer pressure exercising its choice on the food chain.

In recognising that consumers can have a powerful effect on the European food industry, it becomes important for the pesticide industry to adopt an understanding and empathetic response to consumer concerns and the food chain in its business processes.

The pesticide industry is under new scrutiny. The factors that once were the driving force of the industry, efficacy and cost of product, are no longer alone as the key drivers of product choice on farm. Today, the political face of Europe is changing rapidly. New pressures will



ensure that the price support mechanism of old will need to alter. In the future, price support for farming will concentrate both on tending to the needs of large numbers of small farmers in southern Europe and on rewards for farmers that return environmental good to their farms.

In the heavily populated and urbanised UK, the public have come to expect greater access to the countryside and a society has emerged that has romantic views on how the countryside should look. Farming more akin to Constable's paintings has become the new expectation. Few are interested in understanding modern efficient farming techniques that embrace the prudent and targeted use of pesticides.

In food production, UK consumers take an active interest in a number of key areas including:

- Social justice – people are not exploited by others
- Value for money
- Food which is deemed to be natural
- Safe food
- The future of UK farmers
- Choice in food variety available
- The impact of farming on the look of the countryside and its wildlife
- Animal welfare in rearing livestock

From these aspects, the pesticide industry begins the new millennium with three key areas that the food industry has identified as important to ensure public confidence. They are:

- The likelihood of pesticide residues in the food
- The environmental impact of products used
- The safety to the spray operator of products used

## **PESTICIDE RESIDUES**

In the area of pesticide residues the UK has become a dominating country within Europe because of three main factors:

- a) The Working Party on Pesticide Residues (WPPR) surveys
- b) The media's heavy coverage of the government's 'name and shame' policy
- c) The need for due diligence by the food industry

### **(a) The WPPR survey**

The UK is rare in the world in having a series of long-running independent monitoring programmes tracking crop protection products. The data these provide give a comprehensive overview of how well and how safely crop protection products are used and it is an encouraging picture.

The UK government's comprehensive food residue monitoring programme, now overseen by the WPPR, has operated since 1966. Under the current scheme, food on sale to the public is bought at random from shops and markets all over the country. Sensitive analytical techniques are used to check for residues. Where residues are detected – and over 70% of the samples in the most recent tests were free of residues – they are nearly always below one part per million.

The monitoring programme covers all the main groups of food such as bread, milk and potatoes and includes a wide range of fruit, vegetables and other foods. Results from 1994 to 1998 show clearly that the vast majority of crop protection products are being used correctly. In the most recent report (1998), over 90,000 individual tests were conducted.

### **(b) 'Name and Shame' by the media**

'Name and Shame' creates concern among retailers who understandably are determined to avoid adverse publicity. In particular, reports from the WPPR surveys are released to the media mentioning both product and place of purchase wherever MRLs have been breached. UK retailers are keen to maintain the integrity of their 'own label' brands, which now account for 60% of the top 10 retailer product sales. Avoidance of adverse publicity is fuelled by the need for retailers to maintain volume turnover in a fiercely competitive marketplace. High turnover volumes help buying power.

### **(c) Due diligence**

The retailers avoid adverse publicity by enforcing exacting requirements directly on to their suppliers under the name of due diligence. They have passed responsibility down the food supply chain for potential residue infringements through a robust paperwork tracking system with appropriate traceability processes. Within the UK, those who prepare food and those who import it can be charged with an offence under the 1990 Food Safety Act. It is easy to see, therefore, why importers become interested in the way food is grown abroad as they seek to avoid being implicated under the Act. Due diligence has also created a culture of concern that supply contracts could be lost, should any failing in the monitoring or any breaches of residue levels be detected.

It can be said that consumers are served well by the operation of due diligence and the competitive forces that it creates. This arises because paperwork, technical monitoring tests and physical auditing ensure growers strictly adhere to MRL levels, label recommendations on dose rate, harvest intervals and appropriate crop clearances for the chemicals applied.

## **ENVIRONMENTAL IMPACT**

The environmental impact aspects of pesticide use is a relatively new area of public interest and a fresh challenge to the pesticide industry. The established regulatory process of assessing environmental impact is reinforced in the field by food industry agronomists seeking to ensure that choice and use of product confers the least environmental impact. In response, some agrochemical manufacturers have produced extra environmental information available to agronomists over and above the information that is currently contained within the label text. These environmental documents seek to deliver information that falls within agreed categories outlined below:

- Wildlife: terrestrial mammals and birds
- Bees: principally honeybees
- Non-target insects/ other arthropods e.g. ladybirds, ground beetles
- Aquatic life: risk to organisms in ponds, streams, ditches
- Soil and ground water: persistence and risk to earthworms, potential for leaching

- Field margins: consideration for uncropped wildlife habitats (hedgerows and conservation headlands)

Each Environmental Information Sheet discusses environmental impact risk assessment for:

- Water courses and woodland
- Hedgerows
- Field margins
- Conservation headlands
- Beetle banks

For those in the food chain who are involved in the agrochemical decision-making process, such environmental information can play an important role in ensuring environmental impact of a product is minimised.

## **OPERATOR SAFETY**

The emerging emphasis on operator safety in grower protocols is leading to a keener interest in closed transfer systems and also in returnable packs. For Aventis, the Surefill system for the safe transfer of aldicarb to the applicator hopper is now a standard endorsed by food chain protocol schemes. The added benefit of returnable packaging is less packaging to be disposed of by growers and farmers. Packaging disposal has been identified by EUREP (the Euro-Retailer Working Group) as a key focus of interest.

## **OTHER INFLUENCES ON PESTICIDE USE**

### **Baby Foods Directive**

The EU Directive on residues in baby foods imposes an arbitrary standard where residue levels are set effectively at the Limit of Detection. The imposed level of 0.01mg/kg is currently below the recording level that has been legally used in the regulatory requirements for many products. Further practical complications occur where food companies apply the Directive to residue levels at farm gate rather than in processed or prepared foods. Baby food manufacturers have based their chemical protocol lists quite often on published MRL data rather than actual residues in the processed food.

Farmers, through economic necessity, keep their marketing options open by applying the protocols for baby food to every fruit and vegetable crop on the farm. This results in a *de facto* extension of the acreage grown to baby food standards.

### **Two-year 'use-up' period**

The two-year use-up period available to the industry to manage the logistics of a safe sell-off of revoked chemicals is challenged by food manufacturers and processors. They want to apply revocations immediately, or even ahead of introduction, in order to secure markets for produce that may remain in storage. Growers, too, are driven by fear of retailer customers applying revocations without consideration of the 'use-up' period. The most straightforward impact of revocations being applied either ahead of introduction or at the same time, is that

the chemical supply chain gets left with stocks of unsaleable product.

The situation represents a rejection by the food industry of a legitimate logistical process established to manage phased withdrawal. The statement "the pesticide was legal at the time of application" seems to hold little sway with food companies caught with stored foods after a revocation date has passed.

### **Specific Off-label Approvals (SOLAs) and the European review**

The tools in the growers' armoury will face a dramatic reduction in numbers following the imminent EU Review. The final number of molecules that will be supported has yet to be confirmed but the likelihood of less than 300 molecules available after 2003 is emerging as a reality.

There is also the pressing problem that, in many vegetable, fruit and salad crops, lack of SOLAs across most of the EU is creating a dramatic shortfall in the agrochemical solutions available for the future.

### **Provision of information**

MRL databases both within countries and across countries of the EU lack consistency in the information provided. Given the use of MRLs as a key benchmark measure on residues, these variations need to be overcome by the adoption of a reliable European MRL database. The agrochemical industry must work with speed to help deliver a common database since many within the food chain regard provision of MRL information as a straightforward task, despite the many difficulties in pulling together the information.

### **Grower protocols**

Fragmentation and competition between food companies across Europe and their own various interpretations on safety or residue levels is resulting in a plethora of protocol lists – both negative and positive lists. Field advisors across Europe are on the receiving end of a vast and often conflicting range of lists and growing protocols. To ensure compliance, recommendations according to the most stringent list rapidly become the norm as growers seek to ensure all possible markets remain open for their crops. The protocol system is leading to some agrochemicals becoming 'demonised'. Appearance on banned lists challenges the legal regulatory process and a common cry across Europe is of a "two-tiered regulatory system".

## **THE RESPONSE OF THE PESTICIDE INDUSTRY**

With all these issues as the focus for the food industry, it needs to be asked how well equipped is the pesticide industry in its response. At a fundamental level the pesticide industry is expected to 'provide information'. In particular, information is expected by the food industry in the areas already mentioned of residues, environment and operator safety.

Undeniably the pesticide industry has to be concerned as to whether the information it provides is interpreted correctly.

On the issue of MRLs alone, the most topical of all measures now widely used by the food industry for decision making, it is interpreted too often as an absolute measure of food safety. The Acceptable Daily Intake (ADI) system also suffers from misunderstanding and features less frequently as guidance on food safety than it warrants. The 'hundred-fold' safety margin set for ADIs is a level of technicality rarely understood or accepted. Both MRL and ADI information is generally misrepresented by journalists.

The food-chain industries must address the question on how to overcome the misunderstanding on MRL and ADI concepts that continue to prevail. Given that consumer expectation is for zero residues, we must ask how the industry can overcome the complexity of the scientific measure we are using.

### **THE WAY AHEAD**

Clearly new forces are at play across Europe that present new challenges for the pesticide industry. Many find it easy to blame the retailing and food production companies for situations that challenge the freedom to sell pesticide products to farmers and growers. But in reality, the food industry is reacting to a consumer driven marketplace in which many of the scientific and technical judgements and arguments are lost in a sea of new affluence, campaigner groups, media hype and widespread uncertainty about food production methods. The pesticide industry faces a challenging future in which it will need to recognise the issues from consumers and find ways to deliver solutions that work in harmony with the concerns that prevail.