

A Manufacturer's View of the Problems and Opportunities for the Crop Protection Industry Caused by the Green Movement

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Crop protection is a major target of environmental campaigners resulting in many new regulations and controls. This has resulted in the withdrawal of many products and recommendations which has a particularly large effect on horticulture. Development of biological control methods has accelerated as a result, together with new products, new pesticide formulations, and new application technology. The U.K. horticultural industry must work hard to maintain "off label" approvals within the new European registration scheme.

INTRODUCTION

"The Green Movement" covers many areas and aspects of daily life and it has many ramifications, not least upon the crop protection industry. A simple definition of the movement is suggested as: "individuals and organisations who seek to improve the environment and the quality of life." Methods of achieving this include: conservation; the reduction of consumption by the use of recycling and renewable resources; and the reduction of pollution.

Crop protection products, herbicides, insecticides, fungicides, plant growth regulators, etc., have been accused of causing pollution since the publication of *Silent Spring* by Rachel Carson more than 30 years ago. While often exaggerated, distorted, or untrue, the concept that crop protection products cause pollution has and is having very direct effects on farmers and growers including growers of ornamentals and nursery stock. In the U.K., for example, the banning of the insecticide aldrin has led to problems controlling vine weevil. A future threat to growers will, if introduced, be the requirement to avoid polluting waterways by recycling water within the nursery.

THE SCALE OF ENVIRONMENTAL INTEREST

Membership of the Royal Society for the Protection of Birds, one of the most popular environmental organisations in the U.K., grew by 288% between 1973 and 1987 (Aitkin, 1988). Similar organisations have experienced similar growth. With this growth has come demands for controls on industry, agriculture, and crop protection.

MORI (Market Opinion Research Institute) surveys (British Agrochemicals Association, 1994) show that between 1985 and 1994 the proportion of the U.K. population expressing concern about the environment grew from 54% to 70%. This level is fairly even between males and females and between age groups and social classes.

Environmental issues that cause concern have changed, however. Between 1990 and 1994 concern over exhaust fumes rose from 11% to 21% of the population to

make it the issue of most concern. Other issues of growing concern include pollution of waterways, loss of countryside, and industrial pollution. Concern over crop spraying/pesticides declined over the same period, from 10% in 1990 to 6% in 1994, suggesting perhaps that the vigorous campaign of public education mounted by the BAA in recent years is having an effect.

The sheer scale of the green movement through the vast number of organisations involved and with the majority of the population concerned about environmental issues and thus sympathetic to all but the most extreme organisations, has resulted in tremendous influence being wielded. Government, the European Union, educationalists, the media, supermarket chains, and industry have all been and continue to be influenced by the green movement.

EFFECTS OF THE GREEN MOVEMENT ON THE CROP PROTECTION INDUSTRY

Campaign groups have raised awareness of pesticides during the past two decades. Much of this has been through scare stories which the media have responded to and while hard scientific data has often been missing at the time or has subsequently exonerated the product concerned, images of "danger", "pollution", "residues", etc., have become associated with crop protection products. The effects caused by this raised awareness are:

- Legislation and controls imposed by the U.K. government.
- Directives and controls imposed by the EU.
- Supermarkets and other organisations involved in the processing, packaging, and distribution of crops, particularly fresh produce, now monitoring and direct producers.

The greatest effect of the green movement is in lobbying for legislation to control the research and development, manufacture, sale, distribution, storage, use, and disposal of crop protection products. Thirty acts and sets of regulations now control the crop protection industry of which 17 have been introduced during the last 10 years (British Agrochemicals Association, 1994). Whilst some of this legislation also covers other industries, e.g., The Environmental Protection Act, 1990, others are specific to the crop protection industry, e.g., Control of Pesticides Regulations, 1986.

Many of the regulations are complex and there are constant amendments and updates, thus product labels and instructions have to be frequently updated and reprinted. The continuing changes have necessitated an average of six label reprints for each Hortichem product during the past 10 years.

Similarly, there have been requirements for packaging to be changed and modified resulting in much wastage. From 1995 all packaging of crop protection products sold in the U.K. will have to comply to United Nations standards.

The green movement has also been very effective in influencing the European Union and thus there are many directives which affect crop protection products. Many of the directives parallel U.K. legislation so there is now an ongoing process of harmonising U.K. legislation with that of other member states. Inevitably, this adds to the complexity and costs of interpreting and implementing the legislation.

Some of the European directives are extreme and arguably impossible to implement. For example, the European Drinking Water Directive limits pesticide residues to 0.01 ppb. For many substances there are no methods of detecting such low levels and many member states do not possess the facilities or qualified people

necessary to run such tests. Even so, farmers and growers will have to install water recirculation systems to avoid the risk of contaminated water entering waterways.

The supermarket chains have embraced those aspects of the green movement which enhance their public image. To quote a leaflet on pesticides recently issued by Sainsburys: "Along with farming organisations, Sainsburys is encouraging its suppliers to go further down the green road." Many of the leading British supermarket chains have formed a partnership with the National Farmers Union and with inputs from other bodies, e.g., The Ministry of Agriculture, have issued protocols for individual fruit and vegetables crops for growers to adhere to. These emphasise "reducing whenever possible" the use of chemical pesticides. Undoubtedly protocols for cut flowers, pot plants, etc., will be issued in due course.

Supermarkets also monitor produce for residues using the Pesticides (Maximum Residue Levels in Food) Regulations 1988 as standard. This is now being replaced the EU Maximum Residues in Foodstuffs Directive.

THE CONTROL OF PESTICIDE REGULATIONS

An examination of all of the legislation that affects the U.K. crop protection industry is outside the scope of this paper but the Control of Pesticides Regulations 1986 (COPR) which implemented part (iii) of the Food and Environment Protection Act 1985 does warrant comment since the regulations have had such profound effects.

Prior to 1986, registration and approval of crop protection products in the U.K. was controlled by two voluntary schemes which were relatively simple and inexpensive. The requirements of COPR have greatly increased the amount of toxicology data and other data required for registration which is extremely expensive to generate. It is also necessary to submit data on the efficacy of a product submitted for registration. The effects of COPR are summarised in Table 1.

Table 1. Effects of COPR 1986.

Action	Results
Withdrawal of clearance of certain old products	Loss of products
Review of clearance of older products	Loss of products Loss of horticultural recommendations for retained products
Extra data requirements to maintain existing products	Loss of horticultural recommendations
Extensive and expensive data requirements to register new products	Few new products for horticulture

As can be seen, the registrations of certain old crop protection products have been withdrawn which has meant sales of these products has been discontinued. Often, these withdrawals, e.g., DDT or mercury-based products, were at the instigation of the EU.

The Ministry of Agriculture's Pesticides Safety Directorate (PSD) which implements COPR has a programme to review the registrations of all retained old products. If there are deficiencies in the data, e.g., efficacy trials, the product will

be refused registration unless the manufacturer is prepared to generate new data. The effects of this are the continuing loss of older small volume products and the loss of minor uses e.g., horticultural recommendations of those products which are re-registered. Similarly, maintaining registrations of younger products or adding new minor horticultural uses has become very expensive and thus minor uses are lost or are not even applied for. The cost of registration is now so expensive that for a completely new product it is only a commercially viable proposition for the major agricultural crops.

Commercial horticulture in the U.K. has had to accept that it is losing products and that there is an absence of replacements. This is demonstrated by an examination of weed control in U.K. horticulture (Atkins and Burn, 1991).

Table 2. Increases in UK registration costs 1989 to 1994.

Service	1989 £	1990 £	1991 £	1992 £	1993 £	1994 £	Increase (%) 89-94
Experimental permit	50	250	1000	1550	1600	1600	3,200%
Normal stream	250	750	1700	2250	2300	2300	920%
Evaluation fee ¹	7000	30,000	33,000	49,000	54,000	60,000	857%
Off label	50	250	450	450	460	460	920%
Levy on sales	0.68%	0.96%	1.63%	1.85%	1.81%	?	292% (88 to 93)
Annual rate of inflation	7.8%	9.5%	5.9%	3.7%	1.6%	2.5% (est.)	35%
Price of 5 litre pack of Childion ²	28.13	28.13	32.01	34.15	36.90	36.90	31.2%

¹ Evaluation fee refers to evaluation of new compounds.

² Price of Childion is given as an example of pricing of a typical commercial horticulture product over the period. Prices are distributor list prices. During the 1987-92 period, three statutory label changes for Childion have been implemented.

Direct registration costs, i.e., the PSD fees, are very high in the U.K. since the PSD mandate is to operate a policy of complete cost recovery. Table 2 gives examples of some of the fees charged and how they have increased over the period 1987 to 1994. A comparison with registration costs in other European states is given in Table 3. The U.K. has the highest costs for any European state and together with Denmark, is the only state to impose a levy on manufacturers sales. With direct costs of registration in the U.K. about 100 times more expensive than say France, it is perhaps not surprising that very few new products or new recommendations are introduced for horticultural crops.

In recognition of the problems of COPR, the PSD introduced the Off-Label Scheme. Essentially, it allows, at the users own risk, the use of registered products

Table 3. European registration costs compared—1992 (Value in £ 1992)¹.

	GB ²	F	D	DK	N	GR	P	CH	I	IRL
New registration	53,000	545	6180	0 ³	582	210	60	8455	455	910
Re-registration	0	545	1090	0	870	64	0	0	0	682
Annual renewal fee	0	0	0	45	0	0	365	0	0	90
Minor amendment	600	0	1090	0	290	64	18	0	455	90
Major amendment	2250	100	2270	0	0	0	0	0	455	180
Trials clearance	1550	1000	NA	0	0	2770	590	0	455	180
Other fees	0	0	2730	0	870	64	0	0	0	0
Levy %	1.85	0	0	3	0	0	0	0	0	0
Market value £m (home sales 1991)	416	1251	651	133	118	68	59	53	500	32
Total cost (£m) of Registration scheme	10.4	NA	NA	3.5	NA	NA	NA	NA	NA	6

¹ Notes: (1) New registration fee for the U.K. includes a sift fee of 4000.

(2) The most recent comparison of registration fees was issued by the European Commission in July 1992.

² GB=United Kingdom, F=France, D=Germany, DK=Denmark, N=The Netherlands, P=Portugal, CH=Switzerland, I=Italy, IRL=Ireland.

³ 0 = No fee applicable, NA = No information available sources BAA/ECPA.

on non-edible crops. It also allows the use of products registered for significant crops on botanically similar minor crops. Growers and growers organisations can also apply for specific off-label approvals provided that the necessary residue and efficacy data is generated and submitted.

While the Off-Label Scheme has been a lifeline to commercial horticulture and other minor markets, there are problems:

- The fee for a specific off-label registration has risen significantly since the scheme was introduced.
- The data requirements for specific off-label submissions have increased and are expensive to generate.
- The scheme is only valid for products registered for major crops. It does not help in the registration of new products.

Hopefully the Off-Label Scheme will be retained when the U.K. registration scheme is harmonised with the pan European registration scheme. Without the Off-Label Scheme, there would be serious consequences for U.K. producers of horticultural and minor crops. The horticultural industry must not miss the opportunity to fight for the retention or improvement of the Off-Label Scheme while European harmonisation is taking place.

OPPORTUNITIES BROUGHT ABOUT BY THE GREEN MOVEMENT

There have been some positive effects of the green movement on the crop protection industry:

- **Registration Protection.** Because of the cost and complexity of registering a product, once obtained the product and thus the manufacturer is protected, i.e., even when the product is out of patent a competitor cannot easily introduce an identical product.
- **Biological Control.** Research and development of biological-control products has been stimulated, thus products like pheromone traps for pests have been introduced and new products based on naturally occurring bacteria, fungi, etc., which affect specific weeds or pests, are likely to be introduced shortly. So-called natural predators and parasites, i.e., insects which are harmless to crops but which attack those insects which are crop pests, have become widely used, particularly in protected crops and new businesses have been created to produce and distribute these natural predators.
- **Integrated Pest Management (IPM).** Where naturally occurring beneficial insects are encouraged, a new lease of life has been given to some older insecticides which have a narrower spectrum of activity than some of the more modern insecticides.
- **New Formulations.** The banning of persistent insecticides like aldrin has encouraged the development of novel formulations of modern short-persistence insecticides so that the release of product is controlled and extended. SusCon Green (chlorpyrifos) for controlling vine weevil in growing media is a good example. Development of formulations which are easier and safer to handle than conventional liquids and powders has been encouraged, particularly by the legislation governing the safe handling of pesticides.
- **Application equipment.** Applicators which reduce drift and wastage of products have been developed in recent years whilst the closed fill systems, i.e., systems which allow a product to be added to a sprayer tank and sprayed without any direct contact with the product being necessary are becoming more viable.
- **New products.** Agriculture at least is still benefitting from a flow of new crop protection products. Many of these new products are characterised by being very active and thus are used at very low doses, often grams per hectare, and of being very specific in action. This trend of new products which better fit environmental requirements looks likely to continue.

CONCLUSIONS

The green movement has caused, by skillful lobbying and publicity, restriction and control of the crop protection industry through the regulations and directives that have been introduced. The accession of the Nordic states to the EU will probably add to the green pressure on Brussels. While in recent years, manufacturers, through their trade organisations, have helped to moderate the effects of the green movement and have achieved a better understanding by the general public and a less hysterical reaction to crop protection, much counter-lobbying and education will still be necessary. In the U.K., the slavish devotion by officialdom to the

directives emanating from Brussels, compared to the more relaxed and sympathetic approach of officialdom in countries such as France, together with the lack of any government subsidy of the U.K. registration scheme has had a particularly serious effect on the availability of crop protection products for minor crop areas including horticulture.

It is respectfully suggested that organisations such as the I.P.P.S., which have achieved a reputation for the encouragement of horticultural technology and the dissemination of this technology, should seek more understanding and take more note of the threats to the horticultural industry and become more politically active. Failure to do so could lead to the loss of essential products on the propagation bench like IBA and NAA.

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