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Towards pesticide reduction policies

Three European countries (the Netherlands, Denmark and Sweden) have instituted comprehensive pesticide reduction policies. This article looks at their experiences in identifying what a pesticide reduction policy is, how it should be developed and who should be involved. It builds on work done by The Pesticides Trust for WWF (WWF International 1992 and Pesticides Trust 1992).

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Since the mid-1940s, pesticides have been a major part of the chemical technology used in modern, intensive agriculture in Europe. Although this has contributed to increased agricultural production, there has been a price to pay for 'cheap' food. Intensive pesticide use has contributed to:

- impoverishment of biodiversity, from direct poisonings, and also from species and habitat loss
- increasing levels of pesticide residues in surface, ground, and sea waters
- risks to human health through direct or occupational exposure, and through indirect exposure from residues in food and water
- atmospheric pollution by air-borne pesticides and long-range transport of pesticides including damage to the ozone layer
- long-term effects on soil micro-organisms and crop health by pesticide residues
- accelerating development of resistance to pesticides by the adaptation of pest populations.

Over the years, agriculture has become dependent upon chemical solutions.

Sustainable use

What is the point of reducing pesticide use? If it can be reduced with minimal reduction in crop yields, risks to health and the environment can be reduced, sustainability promoted and lower input costs will protect profit margins. FAO's policy on sustainable agriculture and rural development (SARD) is beginning to focus on these issues.

Some of these ideas were considered in a recent US report on alternative agriculture, which looked at 14 farms managed with an efficient combination of alternative and conventional practices (US National Research Council, 1989). The report concluded that 'well-managed alternative farming systems nearly always use less synthetic chemical pesticides, fertilizers, and antibiotics per unit of production than comparable conventional farms. Reduced use of these inputs lowers production costs and lessens agriculture's potential for adverse environmental and health effects without necessarily decreasing (and in some cases increasing) per acre crop yields and the productivity of livestock management systems'.

Quantifying benefits

In looking at the benefits of pesticide reductions, one has to look at all present costs related to pesticide use, such as human pesticide poisonings, reduction of fish and wildlife populations, livestock losses, destruction of susceptible crops and natural vegetation, honeybee losses, destruction of natural predators, evolved pest resistance, and the creation of secondary pest problems. A US study looked at

public health and environmental costs and benefits (Pimentel et al., 1991). These were compared with the agricultural benefits and costs of reducing pesticide use by substituting currently available IPM, low-input, and alternative pest control strategies for current pesticide control strategies. The study concluded that it may well be possible to reduce the use of pesticides by 50% at an extra cost of approximately USD 1 billion. But these added costs for non-chemical alternatives to pesticides would be offset by the reduced environmental and public health costs.

Examples of Reduction Programmes

A number of agricultural nations are now experimenting with reduction programmes. Denmark developed a plan in 1985 to reduce the use of pesticides by 50% before 1997. In Sweden, a programme was put forward in 1988 to reduce pesticide use by 50% in 5 years. The Netherlands has developed the most comprehensive, sector-by-sector policy in an attempt to reduce its usage of pesticides by half of 1990 levels by the year 2000.

The Dutch usage of pesticides is far greater than anywhere else in Europe. About 60% of Dutch agricultural income is earned by exports. Flower, bulb, and vegetable production is high, particularly in glasshouses. Agriculture is characterised by very small farms, using chemically intensive production methods. The use of pesticides in the Netherlands follows a different pattern from that in Sweden or Denmark or the UK. Farmers in the Netherlands use on average 20 kg/ha of active ingredients every year, which compares with 12 kg/ha for Belgium, and 4

Flower production in Dutch greenhouses.

kg/ha for Germany and the UK. The Dutch reduction programme was prompted by unacceptably high levels of pesticide residues in air and water.

What are the lessons that can be learnt from the three programmes? Four key issues emerge: the need for comprehensiveness, for clarifying the reduction concept, for setting targets, and above all for a good consultation process with all parties involved.

Need for comprehensiveness

A reduction policy means that first of all it is necessary to have a comprehensive and clearly understood overall policy on pesticide use in agriculture and other sectors. It is not sufficient to regulate pesticides on a one-chemical-at-a-time-basis. The cost and benefits of pesticides should be judged in comparison with other non-chemical methods of pest control. This should be the basis for arriving at such policy. It is important that the decision making process separates the political and scientific decisions about pesticides.

There is more to reduction than reducing pesticide use. Any policy formulation should therefore clarify the reduction concept: what exactly is being reduced? The amount of pesticide used is generally given by the weight of active ingredient sold, or the volume of product used, but this overall figure needs to be qualified, as neither weight nor volume relate directly to toxicity, efficacy, or application frequency.

In the 1950s, a typical application of pesticide would require application at several kg/ha. Newer active ingredients are now more efficacious at a lower dose rate. The weight of active ingredient required to achieve the same level of pest control has dropped. Atrazine could be applied at 1-2 kg/ha, and the new generation of sulphonylurea herbicides, for example, can be applied at 5 gm/ha. Pesticides allowing lower application rates are by definition more biologically active; and because the smaller amounts still have a great effect on pests, their effect on health and the environment may also still be negative. They require even more care in use and disposal. In other words, even reducing the amount of active ingredient does not guarantee a reduction in health or environmental hazard.

Pesticide reduction means more than reducing the amount of active ingredient. The common theme of the policies includes:

- Reduction of dependence on chemical pest control. This aims to wean agriculture and horticulture off the pesticides treadmill and to promote non-chemical pest control.

- Reduction of risks to health and the environment. This aims to cut down the use of dangerous chemicals with adverse effects, by reducing doses, operator and consumer exposure, and application frequencies.
- Reduction of pesticide use. This aims to move forward from simply replacing one chemical with one set of problems, with another chemical that will lead to other problems, to try and reduce the incidence of resistance and residues.

All these themes in practice complement each other.

Setting targets

All three programmes have set clear reduction targets. These have been defined on the basis of a sector-by-sector review of existing pesticide usage and examination of all possibilities for reduction. This enabled setting priorities and targets for each sector. These targets play an essential role in the programmes because they represent realistic programme aims and are there to be monitored and evaluated.

A consultative process

Reduction policies need to be implemented by a wide range of parties, they need to be convinced that it can work. Parties include government departments and agencies, research and scientific institutes, farmers and farmers' organisations, industry, and NGOs - including environmental, consumer and other community groups. The programmes should therefore not simply be announced out of the blue to be foisted on an unwilling audience, but need to be developed through a broad range of consultations on the issues to be resolved.

In the Netherlands, the programme was based on studies made by 10 different

working parties across each agricultural production sector on the basis of which a plan with a package of measures was proposed. This plan represents the translation of the general reduction requirement into concrete policies, measures and quantitative targets. The Netherlands programme, which is the most ambitious, has focused attention on the problems, and its implementation will require cooperation of farmers, users, regulators, and extension services.

Two policy instruments

A variety of policy instruments can be used to achieve the implementation of reduction policies. Regulation and research and development are obviously the most important for any government. Although voluntary measures can go so far, it is only regulators who have the power at the end of the day to compel changes. Research and development is necessary, both by research institutes and industry as well as by farmers themselves to arrive at practical alternatives. Already reduction programmes in the countries mentioned have led to helpful experiments by the different parties on the benefits of low dose rates, reduced application frequencies, and alternatives to chemical pest control.

OUR VIEW

Without a positive commitment to a policy of reducing overall pesticide use, there is no incentive for government agencies, farmers, and advisors to develop alternatives. Leaving it all up to the farmer to use pesticides safely according to label instructions or to producers to develop safer pesticides is in no way a substitute for developing concrete and realistic policy goals. And of course, even developing adequate reduction policies will remain paper work only if their implementation is not carefully monitored and where necessary enforced.

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