

Pesticide reduction in Europe: a guide for our farming future?

By Els Wynen

Since the mid 1980s some European countries have embarked on government programs to decrease the use of pesticides in agriculture. Such programs started in Sweden in 1985, in Denmark in 1987 and in The Netherlands in the early 1990s. Similar schemes are in force in Canada, and the United States has also recently announced its intention to take that direction.

The schemes have been initiated by governments which are particularly concerned about environmental issues. And in the case of the European countries, the effect of pesticides on ground water quality has been important.

Do these schemes work, and if so how? And what can be the consequences of these overseas developments for Australian agriculture?

In summary, it can be said that in the process of implementing policies which also take into consideration the environment, farmers have discovered that decreasing the use of pesticides is not nearly as difficult as originally thought.

Sweden

There is little doubt that, especially in Sweden and Denmark, the decision to decrease the use of pesticides in agriculture was at least partly political. In the 1970s the general public expressed its concern at the presence of pesticides in ground water — an important resource used for drinking water.

In the late 1970s one of the political parties ran with the promise of reducing pesticide use in the elections of 1985. When it won, it then had to implement its promise and a pesticide reduction scheme was the result.

According to this plan the use of pesticides (as measured by the quantity of

Gyrojet pic from brochure
colour

The trend is towards low volume sprays and machines to apply them correctly.

active ingredients used) had to be down by 50 per cent in 1990 as compared to the average used from 1981-85. Another reduction of 50 per cent has been announced to be reached by 1996. This should bring the overall use in that year to 25 per cent of the average of the first half of the 1980s.

Denmark

Denmark started a similar program in 1986-87. Its target reduction was a 25 per cent decrease by 1990 (also as compared to 1981-85). In addition, another measure of pesticide reduction was introduced: the frequency index. This index basically measures the frequency of pesticide use counted in number of recommended doses per hectare.

The Netherlands

The situation in The Netherlands was somewhat different. Here again public and scientific concern for the environmental effects of pesticides was a major reason

why a plan for reduced pesticide use has been adopted.

The use of pesticides was considerable in The Netherlands. Approximately 21 kg per hectare of active ingredients were used per hectare in the early 1990s. In Sweden, the comparable figure was 1.3 kg, and in Denmark 2.6 kg per hectare. Just under half of this amount was used as soil sterilants in the potato and bulb growing sectors, but pesticide use was still considerable in other industries.

Apart from objections by the general public for environmental reasons, farmers started to note agronomic and marketing problems. Pesticide resistance and phytotoxicity (crops getting a setback from the pesticides used) were some of the agronomic problems.

Even so, farmers were not happy with the intentions of the Ministry to curtail pesticide use, and campaigned against it.

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The government decided that all those who were in some way involved with agricultural pesticide use (bureaucrats, farmers and chemical industry representatives) had resolve who was going to carry out the different aspects of the program. The agreement, called the 'Covenant', was signed in July 1993.

PESTICIDE QUALITY

All three countries not only restrict the quantities of pesticides to be used, but they also scrutinise the kinds of pesticides on the market. Different criteria are introduced to measure the appropriateness of the pesticides. The degree of persistence of the pesticide, and the leaching potential through the soil into water are now two more factors by which pesticides are judged.

Documentation about the risks to health and the environment have now become considerably more stringent. In addition, some criteria deal with the possibility to substitute pesticides. For example, registration may not be allowed if other means (chemical or non-chemical) exist which are less harmful to human health or to the environment. This is the case even if the pesticide could be allowable on the set criteria.

Long-term acceptance is also something of the past. For example, in Sweden all pesticides have to be reregistered every five years.

FARMERS' ACCEPTANCE

Farmers in all three countries were angry at the introduction of the schemes. But the results are such that resistance has decreased or dissipated completely. Sweden has found it relatively easy to reach the target, Denmark only marginally difficult and the first signs in The Netherlands seem encouraging.

A few factors have influenced these results, some of which have little to do with decreasing pesticides use in itself.

One of the reasons for the decrease in quantity of pesticides used is the change in types of pesticides in recent years. For example, some of the 'old' pesticides of which 1.5 kg per hectare active ingredient was used previously are now replaced with pesticides with similar results but needing only six grams of active ingredients per hectare. In Sweden the pesticide companies calculated that this change in technology contributed to approximately 16 per cent of the decrease in 1991.

But there has also been a decrease in pesticide use because of several factors, heavily influenced by research.

Two of these factors are the lower doses used per hectare and the development of computer models which allow farmers to take account of the risk that a pest or disease will occur in the near future.

In Sweden and Denmark, trials were done on the quantity of weedicides needed. In trials carried out in the 1970s, it was found that considerably lower rates (such as half) than those recommended killed a high proportion of the weeds. Combined with the crop receiving less of a setback, this resulted in similar or higher yields than with the full dose.

A similar picture occurred for the fungicides. The higher doses were recommended on the packages in order to cover all conditions in all years, while in most years they were not needed to get a good result.

One of the reasons for the decrease in quantity of pesticides used is the change in types of pesticides in recent years. Some of the 'old' pesticides have been replaced with products giving similar results at much lower rates of active ingredient.

Previously, farmers might have sprayed routinely even when the risk of pest or disease damage might be low. The models incorporate the climatic conditions (such as minimum and maximum temperatures and soil moisture) forecast. They also take into account other aspects such as the natural predators present. The total picture would then show the likelihood of the problem occurring in the near future. This would be accompanied with advice about spraying options.

IMPLICATIONS FOR AUSTRALIA

The implications of these developments for Australian farmers concern our competitiveness and our future markets.

Initially the farmers in the countries with the pesticide reduction schemes were upset about their introduction. But now that some time has elapsed they are starting to get used to the idea. Using lower rates and only spraying when the conditions warrant it, appeals as it means lower costs decreases with little reduction in

gross income.

Different conditions apply in Australia. So lower rates might not be an appropriate option — but it would be worthwhile considering.

Models which advise farmers on the optimum time to spray might be more appropriate in the more intensive industries rather than grain. But some have been developed for the grain industry.

Many other areas of research could lead to a reduction in pesticide use. Developing crop varieties resistant to diseases (or able to 'crowd out' weeds), mechanical weed control and biological pest control are a few.

Apart from research, extension activities are also important. In Denmark some farmers have formed groups in which each member maintains records of pesticide applications. At their meetings they would compare the pesticides used and the results.

It showed that applications varied widely between farmers. Recording actual use and talking about its effectiveness increased the awareness of the best application rates and times.

As many farmers in Australia are already members of groups like Landcare, these might be ideal venues to discuss these pesticide issues.

The other aspect of relevance to farmers is the future market for their produce. At present, only Sweden has actually banned some pesticides. In Denmark and The Netherlands decreasing the number of pesticides are long and drawn-out processes.

But there is little doubt that pesticide use is going to be more restricted in the future, certainly in these three European countries discussed. It might well influence policies in other areas, such as the European Community and North America. If so, this should have consequences for imports into those countries.

CONCLUSIONS

Agriculture in some of the European countries, and also in North America, is changing. Apart from being concerned solely with the productivity aspects of farming, the environment is also taken into consideration.

In the process of implementing policies which also take into consideration the environment, farmers have found that decreasing the use of pesticides is easier than originally thought, especially with the right research behind them. n