Danish Pesticide Use Reduction Programme

- to Benefit the Environment and the Health

PAN Europe

Pesticides Action Network Europe

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Why Pesticide Use Reduction?

This booklet summarises the experiences over 20 years in Denmark in reducing pesticide hazards and use. PAN Europe believes that the Danish experience is highly relevant for other European countries and we are disseminating this information in the context of the forthcoming EU Thematic Strategy for a sustainable use of pesticides.

Pesticide use reduction was introduced in Denmark in 1986 by the first governmental Pesticide Action Plan. It was prompted by a major increase in the use of pesticides and a serious decline in farmland wildlife in the beginning of the 1980's. The wild plant diversity in farmland, for example, decreased by 60% from 1970 to 1990, and the catch of partridges fell by 70% from 1970 to 1985.

The main reasons for pesticide use reduction are:

- to protect consumers and land workers against health risks and harmful effects resulting from the use of pesticides and from ingestion of pesticides through food and drinking water
- to protect the environment against harmful effects from pesticides, both direct and indirect, in farmland, water courses and affected natural habitats.

The first Pesticide Action Plan 1986-1997

As it is not possible to specify an environmentally acceptable level for pesticide consumption because both the long term health and environmental effects are unknown, the goal is to reduce the consumption of pesticides as much as possible.
In the first Plan it was decided that total pesticide consumption was to be reduced by 25% by 1992 and by 50% by 1997, and that consumption was to be steered towards less harmful agents.

The reduction was to be achieved partly through advisory activities for farmers and partly through intensified research on ways of reducing pesticide consumption. However, during the first years of this plan the use of pesticides continued to increase, partly because the advisory activities were not effective in persuading farmers to reduce use. The 1992 target of 25% reduction was not achieved, in fact, there was an increase in use of 2%. New initiatives were therefore needed.

The first Plan included initiatives to improve farmer knowledge and skills in correct application of pesticides and good maintenance of spray equipment. From 1993 commercial users of pesticides have been required to hold spraying certificates. These require a course of 2 weeks (74 hours) on spraying, environment and health issues. For farmers established before 1. January 1991 a 12 hour spraying course was sufficient.

From 1994, farmers who cultivate over 10 ha have been required to keep spraying logbooks, in which they enter the products used, doses and crops for individual fields.

From 1994, spraying equipment has been subject to spot checks. Between 300 and 500 of the approximately 45,000 spray machines are tested annually. Yet 70-80 % of those tested still fail to satisfy the requirements. The government don't have some minimum demands to the spraying equipment. A strengthening in this area is under preparation.

Other measures to influence farmer decision-making included the introduction of a pesticide tax, detailed in page 11.

Lessons from the first Plan - rethinking the programme

In 1997, the Environmental Protection Agency presented a progress report on the action plan, which showed that the aim of tightening the approval scheme and of halving pesticide consumption, as measured by kg active ingredient sold, had been achieved. Pesticides most harmful to health and the environment had been banned as a result of revising the approval scheme.

However, the aim of a 50% reduction in the Treatment Frequency Index (TFI - explained at page 7), a measure of the intensity of pesticide application, had not been achieved, since the reduction had only been by 8% (from 2.67 to 2.45 TFI). Figures 1 and 2 show the trends in sales tonnage and TFI from 1986-2003.

Figure 1: Pesticide use in Denmark from 1986 to 2003 in tonnes of active ingredients

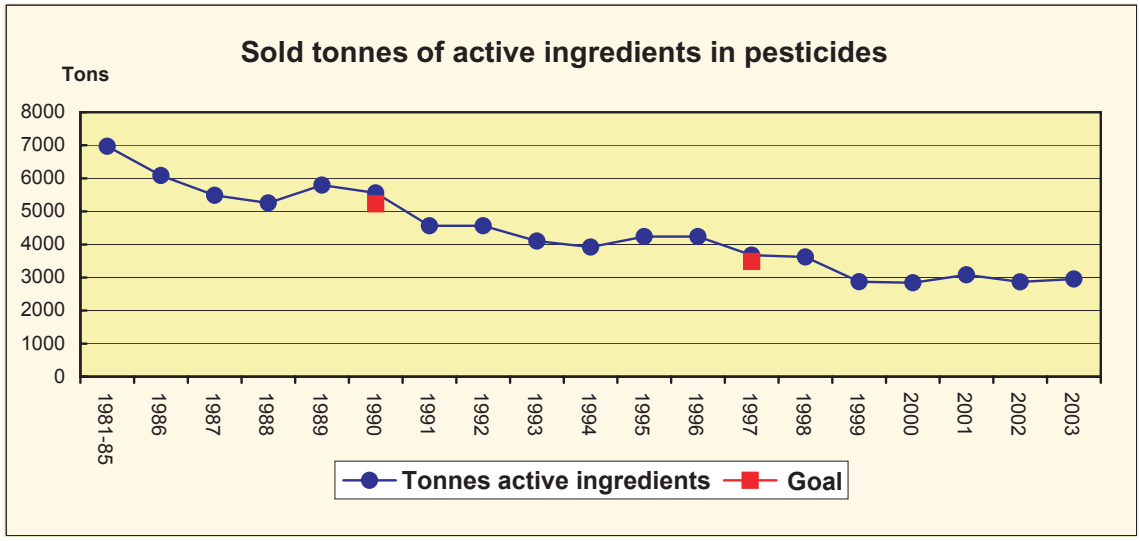
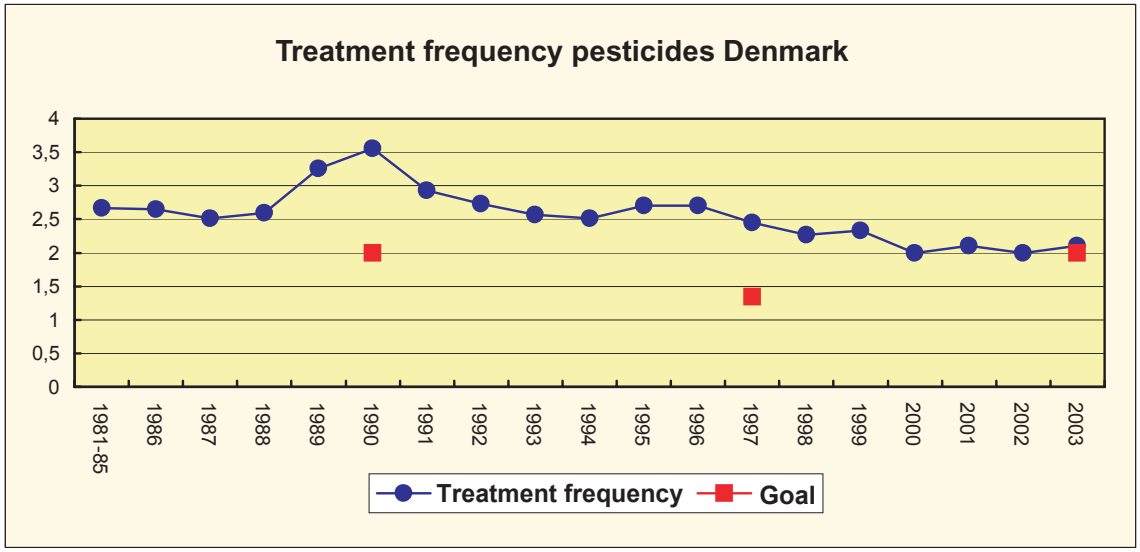


Figure 2: Pesticide use in Denmark from 1986 to 2003 in treatment frequency index



To address this problem, the Danish Parliament decided to commission an independent expert study (the Bichel Committee) to evaluate the consequences of different reduction scenarios for phasing out the use of pesticides in Denmark. The Committee published its report in 1999[1], and its recommendations were used to develop the second Pesticide Action Plan 2000-2003. The committee recommended a three-pronged strategy for reducing pesticide use, namely a general reduction of pesticide use, a reduction of exposure of biotopes, and increased organic conversion. Significant conversion of Danish farms to organic methods has been funded by the government and supported by consumers.

In the second Plan the target was to reach a treatment frequency of less than 2.0 before 2003 and establish 20,000 ha of pesticide-free zones along targeted waters and lakes.

By 2002 the treatment frequency had decreased to 2.04 and 8,000 ha pesticide free zones had been set up along targeted waters and lakes.

In the third Pesticide Action Plan 2004-2009 the target is a treatment frequency of less than 1.7 by 2009, promotion of pesticide-free cultivation and 25,000 ha pesticide-free zones along water courses and lakes. This plan includes fruits and vegetables for first time.

Results and achievements of the Action Plans

In Denmark pesticide use has been reduced from a treatment frequency of 3.1 in 1990-93 to 2.1 in 2001-2003, but Danish investigations[2] have shown that it can be reduced further to 1.4 without significant economic losses neither to the farmers nor the society.

Water pollution

Since 1998 pesticides or their metabolites (breakdown products) have been detected in more than 50% of sampled shallow (0-20 m below ground surface) groundwater abstraction wells. During the period 1998-2003, the annual percentage of wells with concentrations exceeding the limit value 0.1 microgram/litre, declined from 10% to 5%. By reducing the treated area, number of applications and pesticide dose rate, contamination of groundwater can be reduced significantly.

Owing to long hydrological cycle of groundwater the last 10 years of regulating both approved and banned pesticides have yet not worked through to demonstrable results in groundwater. The Geological Survey of Denmark and Greenland concluded that a continuing reassessment of the pesticides approved today means that groundwater quality will improve significantly. Most of the pesticides used today will probably not pollute groundwater above 0.1 microgram/litre, while some may well

be withdrawn from authorisation as a result of the early warning system, which is a field based Danish pesticide leaching assessment program. Today very few approved pesticides are found in wells. In 2003, banned pesticides were found in 25% and approved pesticides in only 6% of water-works boring controls.

Food residues

In 2003 pesticide residues was found in 45% of Danish produced fruits and in 79% of imported fruits of the same type. Only 7% of Danish produced vegetables contained residues but 42% of imported vegetables of the same type contained these. These figures show, that public awareness on pesticide residues has had a significant effect on the use of pesticides in foods.

Biodiversity

In organic fields the biodiversity of wild plants is found to be 100% higher than in conventional fields and the amount of birds are significantly higher. A Danish study[3] on the effects of reduced pesticide use on flora and fauna in agricultural fields shows that half and quarter doses of herbicides and insecticides gives an increased number of wild plant (weed) species, increased proportion of flowering species and increased abundance of insects and birds. Use of half the dose only creates negligible, if any, agricultural problems, especially if supplementary control of particular weed patches is carried out.

Pesticides are often found in aquatic ecosystems. The Bichel report concluded that pesticide use reduction reduces the probability of pesticide effects on biodiversity. A 50% reduction in pesticide treatment frequency index will reduce the probability of pesticide effects on crustaceans in typical Danish ponds from 55% to 25%.

Benefits and costs

The results of the pesticide action plans is not only a decrease in the use of pesticides, but also higher farmer awareness of the pesticide problems, much fewer pesticide residues in Danish fruits and vegetables than in imported, banning of harmful pesticides, stronger use restrictions than in other European countries, better farmer knowledge about the effects of pesticides on the environment and better protection of the groundwater than in other European countries.

The costs of implementing the Danish pesticide action programmes are difficult to calculate. There is no evidence of costs of banning pesticides. The costs of implementing organic farming is not only covering pesticide use reduction but also better animal welfare, less use of fertilisers and food additives etc.

The Danish agricultural extension service has estimated that programme activities advising farmers have reduced pesticide use by 0.75 counted as treatment frequency index, corresponding to national cost savings of about 60 million euros per year. Though the lower pesticide use reduces total yield, a significant part of the savings end up in farmers' pockets.

The following sections describe in more detail some of the methods used to achieve pesticide reduction and activities in the 3rd Action Plan.[4]

How to Measure Pesticide Use and Risk

In most countries pesticide use is measured in tonnes of active ingredients and/or in value. But it does not give a good picture of the environmental impacts or trends in pesticide use because pesticides are used at very different dose rates and the prices are very different.

In Denmark the Treatment Frequency Index (TFI) is used as the most important indicator for the spraying intensity and the environmental load.

The treatment frequency index expresses the average number of times an agricultural plot can be treated with the recommended dose, based on the quantities sold.

A treatment frequency index of 2,0 thus means that the sale of pesticides corresponds to spraying all the conventional farmland twice at recommended dose rate of pesticides sold in the year concerned.

The advantage of this parameter as a measure of use reduction is that it also takes account of modern lower dose pesticides, which are much more biologically potent than older chemicals. It is assumed to reflect the direct effect on target organisms as well as the indirect impact on ecosystems, which results from changes in the quantities and qualities of species in the food chains. The Bichel Committee considered treatment frequency index the best indicator of pesticide environmental burden.

Experience in Denmark has shown a good correlation between treatment frequency index and effects in the aquatic environment, populations size of farmland birds and diversity of flora and fauna in the agricultural fields. Moreover the treatment frequency index mode of calculation is rather simple and transparent.[5]

An OECD project on aquatic and terrestrial indicators demonstrates, for example, that trends in treatment frequency index and load indices for Danish data (volumes weighted with toxicity for algae, daphnia, waterfleas, fish, birds and earthworms) coincide in 7-8 of the 9 years analysed.

A relation between Treatment Frequency and biodiversity in the agro-ecosystem has been demonstrated.[3] Because treatment frequency index is based on a standard dose that relates to the biologically active field dose it is assumed to reflect the direct effect on target organisms as well as the indirect impact on ecosystems, which results from changes in the quantities and species found in the food chain. Treatment frequency index can thus be regarded as an indicator for biodiversity in the terrestrial compartment.

The treatment frequency index cannot be used to track changes in the intrinsic hazard properties. Other simple indicators are available for that purpose. But it is not possible to give a unambiguous image of the harmfulness of the pesticides by one indicator, because their harmfulness is different to spray operators, consumers, mammals, fish, bees, water insects, wild plants and groundwater. The adverse effect depends too on the dose, the spraying equipment, weather and the spray operator. To track trends in risks towards specific aquatic or terrestrial organisms a risk indicator for that purpose should be used. They can bring valuable information on changes in risk over time but do not address impacts on biodiversity.

The treatment frequency index should therefore be supplemented by indicators for a long list of risks, e.g. acute toxicity and long-term effects to humans, acute toxicity to other mammals, to water insects, bees and fish.

Reduction of these risks is a part of the approval scheme for each pesticide, and in Denmark the authorities have taken these risks in consideration by prescribing protection zones, reduced doses or reduced scope of application. This would be possible to a much greater extent, if the substitution principle was implemented, so a pesticide could be banned, if there was a less harmful pesticide or a non-chemical alternative available and able to control pests as effectively.

Methods: Extension Service and Plant Protection Groups

Advisory activities with farmers are an important element of the Pesticide Action Plans. According to the plans, information should deal with the correct use of pesticides, the feasibility of limiting use through changes in crop rotation, choice of seed varieties, mechanical and biological control, assessment of needs and improved spraying techniques. Great weight is attached to basing advice on financial as well as environmental considerations.

By far the greater part of advisory activities is carried out under the auspices of farmers' organisations. The Danish Environmental Protection Agency has supported a number of advisory, information and research projects, which have been implemented partly by the farmers' organisations.

20,000 farmers subscribe to weekly newsletters from the Danish Agricultural Advisory Service, a service belonging to and funded by farmer organisations. The newsletters discuss spray products, preventive measures against insects, damage thresholds and the use of reduced doses. Information is also given on field tours for farmers. The Danish Agricultural Advisory Service estimated in 1997 that the average dose of fungicides applied by their members was about 35% of the pesticide label recommended dose, in contrast to 90% in 1987.

The Danish EPA has supported the development of "PC-plant protection", which is a computer-based tool that can give guidance to farmers and advisers on the need for insect and fungus control, choice of products and doses. The use of crop varieties, which are resistant to fungal diseases has become far more widespread.

Plant-production advisers have also established a network to which they make weekly reports on occurrences of fungal and insect attacks on different crops. This network is used to assist in assessing the need for spraying and the occurrences of fungal attacks is published on the web and in "Farmer Weekly".

The Danish EPA has also supported the establishment of plant protection groups, which consist of 8 to 10 farmers and an agricultural adviser. More than 95 of these plant protection groups were set up by 2001, meeting in the field several times each season to discuss topics such as herbicide selection and dosage and mechanical control options. These groups have had a major effect on farmers' choice and dosing of pesticides.[6]

The Danish model for extension service means that pesticide consumption in Denmark in arable crops is now lower than in other European countries.

Danish National Field Trials have documented that such low consumption is economical for farmers and that the farmer income will increase by lowering TFI further from 2.1 in 2003 to 1.7.

Table 1: An example showing Treatment Frequency Index (TFI), costs and net yield in Denmark, Germany, Sweden and UK in winter wheat.

	TFI	Pesticide price Euros/ha	Number of treatments	Yield Hkg/ha	Net yield Euros/ha
Denmark 1	0.85	40	2	84.1	740
Denmark 2	0.85	40	2	85.1	720
Germany	6.27	250	4	88,2	530
Sweden	1.58	75	2	88.6	751
UK	3.55	130	4	90.7	650

Source: Danish Agricultural Advisory Service 2000

Methods: On-farm Record-keeping and Crop-specific Goals

Since 1994, farmers who have more than 10 ha have been required to keep spraying logbooks. This information is kept at the farm and not passed on to the authorities. The spraying logbooks serve to sharpen farmers' awareness of their pesticide consumption and therefore motivate them to reduce the overuse.

Since 2000, the national agricultural advisory service has set targets for pesticide usage in the different crops to ensure that farmers can meet the targets for pesticide reduction set out in the pesticide action plans. The targets are used as a control instrument at farm level and to make the reduction possibilities visible for farmers. In this way farmers can see if they are using more or less pesticide than the target, and where reductions are possible.

Every year around 3,000 farmers are making voluntary action plans to reduce their pesticide use. In both 2000, 2001 and 2003 these farmers have more than met the target for the Treatment Frequency Index as seen in figure 3.

Table 2: Total Treatment Frequency Index for pesticides in 1994 and targets for some crops at farm level for 2002 and 2009

Treatment frequency Index	Weeds		Fungus		Pests		Growth regulators		Total		
	2002	2009	2002	2009	2002	2009	2002	2009	1994	2002	2009
Winter wheat	1.20	0.95	0.75	0.65	0.25	0.15	0.10	0.00	*3.20*	2.30	1.75
Spring barley	0.70	0.70	0,4	0.35	0.30	0.25	0.00	0.00	*1.80*	1,4	1.30
Winter rape	0.80	0.60	0.15	0.15	0.60	0.80	0.00	0.00	*2.50*	1.55	1.55
Potatoes for consume	2.00	1.60	5.50	5.00	0.35	0.50	0.00	0.00	*6.60*	7.85	7.10
Maize	1.10	1.00	0.00	0.00	0.10	0.05	0.00	0.00	*1.30*	1.20	1.05
Grass in rotation	0.03	0.03	0.00	0.00	0.05	0.05	0.00	0.00	*0.08*	0.08	0.08
Coach grass control	0.30	0.25	0.00	0.00	0.00	0.00	0.00	0.00	*0.20*	0.30	0.25
Average treatment index for all crops	1.28	1.08	0.50	0.46	0.26	0.22	0.05	0.01	*2.51*	2.09	1.77

Source: Danish Agricultural Advisory Service

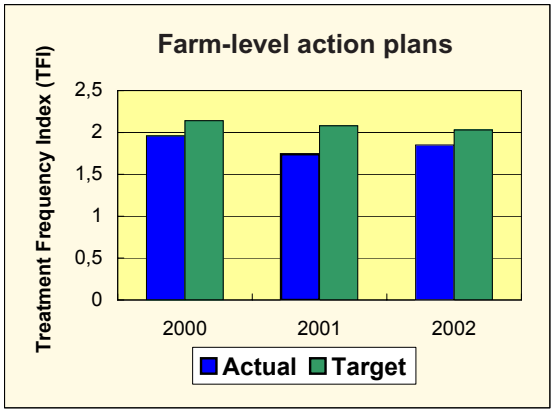


Figure 3: Farm-level action plans

Methods: Changes to the Pesticide Approval Scheme

The Pesticide Action Plan's goal of steering consumption towards less harmful products was made possible by law, so that it would no longer be possible to approve substances considered especially hazardous to health or especially harmful to the environment.

The Danish approval scheme for pesticides has been continuously tightened, and in the last few years, a number of agents considered to be dangerous to the environment and health have been banned.

209 pesticides (active ingredients) were reassessed in the beginning of the 1990's, of which only 78 were given renewed approval. The rest were either withdrawn, not asked for reassessment by the companies or rejected.

The "prohibition procedure" was made difficult by the pesticide companies at first, which appealed against all rejections, so it was possible for them to continue marketing pesticides that had been considered unacceptable by the Danish EPA.

In 1995 therefore, the government amended a new "prohibition procedure" so that all cases recommended for prohibition were submitted to external experts, but without the option for companies to question these experts. The Minister for Environment then makes the final decisions and the relevant active ingredients are then put on the list of pesticides banned or with restricted use.

Denmark has banned use in agriculture of a number of pesticides given recent EU-wide approval by the European Commission (included into Annex 1, the "positive" list of the EU pesticides authorisation directive 91/414). The EU-approved pesticides banned in Denmark are: esfenvalerate, isoproturon, deltamethrin, iprodion, maleinhydrazid, paraquat, propineb, thiabendazol and ziram. The Danish government has imposed tougher restrictions on the use of some other pesticides.

The Danish government has recently decided to support the Swedish government lawsuit against the European Commission inclusion of the highly toxic herbicide paraquat on the positive list of 91/414/EEC.

Transitional schemes

In connection with tightening up the prohibition procedure, the Danish government decided to permit the use of prohibited pesticides under certain special circumstances. For instance, the cultivation of small niche crops, where pests cannot be controlled without the use of a prohibited product and where pests would constitute a significant threat to yield or commerce. These schemes will normally only operate for up to three years and the organisations concerned are required to initiate testing of alternative methods of cultivation.

Methods: Pesticide Taxation

Up to 1996, fees were levied on the agrochemical industry, amounting to more than 3% of the wholesale turnover of pesticides. These charges financed the activities of the approval authorities, inspection and testing, research, information and training.

In 1996 the government introduced an ad valorem tax on pesticides instead of the 3% fee on wholesale turnover. The tax was increased in 1998 and pesticide retailers reduced their prices to counteract the effects of the tax. Though the tax in 1998 was increased from 37% to 54% of the wholesale price, the farmers price for insecticides was reduced by 6% from 1997 to 2003. As most of the proceeds of the tax are returned to the farmers, they therefore earned money by this tax increase.

Today the tax amounts to 34% of the wholesale price in the case of herbicides and fungicides and 54% in the case of insecticides. 13% of this tax finances the activities of the approval authorities and research, 3.5% the pesticide reduction plan and 83.5% is returned to farmers through funds which finances a number of agriculture related activities.

When the tax was introduced, the resultant reduction in pesticide consumption was estimated at 5%-10%. The tax both reduces the overuse of pesticides and makes other pest control measures more competitive, e.g. biological control and mechanical weed control.

The tax has been criticised for being a tax on value because new and more expensive but less hazardous pesticides will therefore get a higher tax than old cheaper and more hazardous pesticides. A fixed tax on the recommended normal dose has been proposed instead, but some pesticides have different normal doses in different crops, so it has been given up.

The tax has been criticised for not being higher on the most hazardous pesticides. Denmark's strategy, however, has preferred to ban or restrict the use of the most hazardous pesticides via regulation and then to have a high tax on all pesticides to reduce their use.

By having a higher tax on insecticides than herbicides and fungicides the lower average price of insecticides should be counterbalanced.

Methods: Pesticide Free Farming and Buffer Zones

The Bichel-Committee recommended a general reduction of pesticide use, a reduction of the exposure of ecosystems and increased conversion to organic farming.

An increase in the acreage under organic production was both an element in the second Pesticide Action Plan and in the second Plan on the Aquatic Environment. The government had set a target of 230,000 ha organic acreage by the year 2003, but it was not reached. In 2003 around 170,000 ha or 7 % of the farmland was under organic production.

It is believed that increased research in organic food production would provide more knowledge and thus increase the possibilities of conversion to organic farming and promote a sustainable development of farming with respect to economic, ecological and social aspects.

Increased development work in organic food production could also increase demand for organic food products, thus improving marketing and thereby attracting more organic producers.

Pesticide free buffer zones

The Bichel-Committee considered that there was a need for additional protection for certain ecosystems and recommended the earliest possible establishment of a 10-12 m no-spray marginal zone around natural wetlands.

There are about 64,000 km of watercourses in Denmark, of which 25,000 km are targeted, and about 120,000 lakes over 100 m^2. With 10-m wide buffer zones along targeted watercourses and all lakes over 100 m^2, the total area of these buffer zones would be about 50,000 ha.

The government target of 20,000 ha buffer zones was not reached so the 3rd Pesticide Action Plan will focus on ways to implement an increased target of 25,000 ha buffer zones along targeted watercourses and lakes before 2009 by paying farmers a higher subsidy, if they place the set-aside areas here.

Pesticide Reduction in Public Areas and Private Gardens

In 1998 public authorities in Denmark agreed to phase out the use of pesticides on all public sector property by 2003, except areas with significant negative consequences on security or health of not using pesticides.

In 1995 a total of 29 tonnes of active ingredients were used on public areas. Of this, the local/district council share was 56%, the share of county councils 7% and that of the State 38%. Herbicides accounted for about 90% of total consumption. The aim of the agreement was to reduce the risks of nature impoverishment and ground water pollution.

Ground water pollution receives a lot of political attention in Denmark, because 99% of all potable water production is based on non-filtered ground water, and around 30% of the wells are polluted by pesticide residues.

Glyphosate herbicide is not approved in Denmark for use in built-up areas, in order to protect groundwater, and therefore flame treatment of weeds is often used.

From 1995 to 2002 the local/district councils have reduced pesticide use by 83%, the county councils by 80% and the State by 73%.

In 2002 92 of the 273 local/district councils and 6 of the 14 county councils didn't use pesticides at all.

1,4 million Euros has been used for information and research in development of alternative pest control methods in public areas.

The most commonly used alternatives are flame treatment and biological control.

Private gardens

Sales of pesticides to private gardens have varied considerably over the years. In 1985 consumption was about 30 tonnes active ingredients, if the moss control agent ferro-sulphate is ignored. By 1997 this was halved to about 15 tonnes. 11 tonnes was herbicides and 86% of this was glyphosate. Insecticides made up 4 tonnes, 70% of which was paraffin oil.

The government encourages the public to reduce pesticide use in gardens and wants the retailers voluntarily restrict the sale to private use in gardens to "ready-for-sale" products, i.e. those that do not need to be diluted. This has yet not succeeded, because few retailers are willing to do this voluntarily.

Responses from Farmers and other Stakeholders

The farmers were very much against the first Pesticide Action Plan from 1986, but the public opinion against pesticides was strong, so the farmers didn't succeed in stopping the plan.

In the following years the farmers pesticide use continued to increase, and therefore the government decided to strengthen the tools. The result was a decreasing pesticide consumption.

The Bichel-Committee and the scenario building process were extremely important in persuading the farming sector to rethink their position. The range of respected experts from different disciplines, the active involvement of the farming sector in evaluating possible future scenarios for different levels of pesticide reduction and the emphasis on financial savings to be made from reducing unnecessary use all contributed. The Bichel-report process and its recommendations led to a great change in the attitude to pesticide use reduction by farmers and pesticide retailers. From then on they supported pesticide use reduction by the wording "As little as possible - as much as necessary".

The conclusions in the Bichel-report were supported by all stakeholders, i.e. that the use of pesticides could be reduced by 30-40% in 5-10 years without significant economic losses for farmers or society in general.

Farmers and pesticide retailers therefore today support the pesticide action plans. They know that they can expect higher taxes or further pesticide use restrictions, if they don't meet the targets.

Danish environmental organisations have criticised the second and third Pesticide Action Plan for not being sufficiently ambitious. The Plans have not totally eliminated the overuse of pesticides in agriculture and have not motivated farmers to increase their use of non-chemical methods significantly. Neither have the plans gone far enough in reducing ecosystem exposure. No-spray marginal zones around wetlands should be established immediately by forcing the farmers to place their set-aside fields here.

PAN Europe Assessment of the Programme

Denmark has since the 1980's been a pioneer member state in the EU on pesticide use reduction. No other member state has developed such a holistic programme to reduce the use and risks posed by pesticides.

Key lessons from the Danish experience are that a successful programme should include:

- a high awareness among the civil society and politicians on the need for pesticide use and risk reduction
- setting of quantifiable targets and mandatory requirements, based on field trials and economic investigations
- active participation from both farmer organisations and farmers
- all stakeholders participate in the plan development
- existence of independent extension advisory service that can advise farmers on how to reduce pesticide dependency on a crop-specific basis

Main difficulties encountered in programme implementation include:

- insufficient knowledge among farmers about pesticide reduction possibilities and their attitude to weed control
- insufficient motivation among farmers to reduce pesticide use
- insufficient legislative and financial incentives for farmers to reduce pesticide use

To disseminate these Danish experiences to all member states PAN Europe in 2002 made a suggested text for a Directive on pesticides use reduction in Europe (PURE). The text can be found at www.pan-europe.info

Though Denmark has reduced the use of pesticides from a treatment frequency at 3.1 to 2.1 over a ten year period, new Danish investigations show[2] that the treatment frequency could be reduced to 1.4 without significant economic losses either to farmers or society. This means that there are still many farmers in Denmark who use far more pesticides than necessary.

PAN Europe therefore recommends the Danish government to strengthen the pesticide use reduction programme further.

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About PAN Europe

Pesticide Action Network (PAN) is a network of over 600 non-governmental organisations, institutions and individuals in over 60 countries worldwide, working to replace the use of hazardous pesticides with ecologically sound alternatives. PAN Europe is the regional centre in Europe of the Pesticide Action Network (PAN), was founded in 1987 and is facilitated jointly by PAN Germany and PAN UK. The PAN Europe network consists of consumer, public health and environmental organisations, trade unions, development and sustainable farming groups and farmer associations. We have over 50 partner organisations throughout Europe and over 200 organisations and individuals receive our newsletter. Our campaign for Pesticide Use Reduction in Europe (PURE) is supported by 91 organisations in 30 European countries.

PAN Europe's work aims to achieve policy change at European level for:

- more effective controls on pesticides to better protect human health and the environment
- concrete targets and timetables for pesticide use reduction
- promotion of safer and more sustainable management of pests, diseases and weeds
- more transparency and public participation in pesticide policy and decision-making

PAN Europe is the focal point for NGO advocacy and public participation in EU pesticide policy and our activities include: lobbying at Brussels level; disseminating information on pesticide problems, regulations and alternatives; organising workshops and conferences and facilitating dialogue for change between government, private sector and civil society stakeholders.

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