# PAN Europe

***Pesticides Action Network Europe***

# Pesticide taxes- national examples and key ingredients

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The Commission Communication *Towards a Thematic Strategy for the Sustainable Use of Pesticides* considered the introduction of special levies on Plant Protection Products (PPPs) as a means to encourage the use of low-input or pesticide-free farming particularly by application of a financial instrument. Although the Commission now rejects a harmonised EU level tax, it leaves space for the introduction of different tax schemes in order to fulfil different environmental and health concerns in different Member States.

Some Member States have already introduced specific levies, while others are planning to do so. Introduction of an environmental levy or tax would raise awareness of the detrimental effects of pesticides and could serve to finance national plans for the reduction of pesticide dependency. This briefing gives examples of taxes already introduced in Norway and two EU countries, Denmark and Sweden and provides key ingredients for successful incorporation of pesticide taxation for pesticide use and risk reduction goals.

## *The context of pesticide reduction programmes*

Three Scandinavian countries have undertaken pesticide reduction programmes in the last two decades, Norway starting in 1985, Sweden in 1986 and Denmark in 1987. These started with crude reduction targets in terms of simple use or volume percentages, and have since been revised and refined, with Denmark taking the approach of reducing intensity of pesticide treatment, using the Treatment Frequency Index (TFI) to measure progress. Norway and Sweden have favoured instead a risk reduction approach, compiling risk indicators for human health and environment. A detailed overview of these three programmes and a similar programme in the Netherlands has been compiled by PAN Europe, covering progress up till end of 2003 (1).

These programmes encompass a very wide range of measures, ranging from regulatory actions under which pesticides are authorised for use, fiscal tools, legal restrictions on usage to farmer training and advice, research on alternatives and a suite of voluntary measures. For example, Sweden withdrew 80 out of the 180 active ingredients authorised for use nationally during a rigorous review of its regulatory system during 1990-1994. A total of 54 different measures was reported by the four countries studied, with Sweden instigating 40 measures, and 34 undertaken by Denmark and Sweden. All pesticide reduction programmes incorporated some form of pesticide taxation, with the exception of the Netherlands.

Achievements in reduction in pesticide usage, as measured by gross volume of active ingredient, by the late 1990s, was around 47% for Denmark, 54% for Norway and 67% for Sweden. However, these volume reductions cannot be attributed solely to the government programmes as the pesticide market evolved over a similar period, with sales of newer pesticides active at very low doses (g *per* ha, rather than kg *per* ha for many of the cheaper, older products). As these newer pesticides are biologically active at very small concentrations, a reduction in gross volume used at national level does not equate to a corresponding reduction in risk to health or environment. The Scandinavian countries therefore revised their programme targets to use more sophisticated measures of risk or intensity.

Sweden estimates risk to human health was reduced by 77% between 1997-2001, and environmental risk by 63% over the same period, the third phase of its programme. Norwegian risk indicators show a reduction of 33% and 37% for health and environment respectively, during 1998-2002, exceeding the 25% reduction target of its second phase. Denmark reduced pesticide treatment intensity from a TFI of 2.45 to 2.04 during 2000-2002, narrowly missing its target of bringing the TFI below 2.0. The third phase

of the Danish pesticide action plan aims for a further TFI reduction to 1.7 between 2004-09, although the Danish Ecological Council has criticised the plan for lacking ambition, claiming that this level represents economically optimal use, while TFI could be reduced to 1.4 by 2008, without changes in cropping or serious economic loss (2).

## *Essential elements of pesticide reduction programmes*

We surveyed officials in the four countries to get their views on the most important components of their national programmes, which do vary considerably. Three clear factors for success unanimously identified by the three Scandinavian countries were:

- High level awareness among different ministries on the need for use/risk reduction;
- Extensive advisory service to reach farmers;
- Stricter criteria for authorising pesticides.

Other factors ranked as either a very strong or a definite influence on successful implementation of the programmes were:

- Setting of quantifiable targets;
- Active stakeholder participation in national plan development;
- Good participation of farmers;
- Mandatory requirements (*e.g.* farm-level record-keeping, certification of users).

Denmark and Norway ranked pesticide taxation as a definite influence factor, while Sweden ranked it a small influence only.

Common factors contributing to difficulties in implementing the reduction programme were less obvious. Denmark ranked highest a lack of uptake/interest/cooperation among the farming community, also noted in Sweden. Sweden ranked as definite difficulties: lack of resources for agricultural research and extension; lack of independent information provision to farmers; adverse economic results associated with reduced use of plant protection products. Norway highlighted adverse economic results too, and a lack of high-level political commitment to pesticide reduction.

## *Pesticide taxation systems*

Sweden was the first Scandinavian country to tax pesticides, in 1985, and it remains the simplest system. The Swedish tax is an environmental levy of 20 SEK (2 Euros) per kg active substance, which has been raised to 30 SEK (1st January 2004).

Denmark first introduced taxation in 1992, with a slightly more sophisticated system based on price. Currently it is 54% of retail price (excluding VAT) for insecticides and 33% for herbicides, growth regulators and fungicides. The Danes do not have a banding system within pesticide group or any correlation with hazard or risk but the higher tax on insecticides is related to the general lower price per hectare of this group, so the taxation is a very rough approximation to a tax on application intensity. This is in line with their emphasis on treatment frequency in their recent action plans.

Norway first introduced taxation of agricultural pesticides in 1988. The original system was based on a percentage of the import value of the pesticides. This was changed to a system banded by health and environmental properties in 1999, as a follow-up to their national risk reduction action plan for pesticides (1998-2002) with its emphasis on risk indicators, assessed via a series of scores for intrinsic hazard and exposure. The change to a banded tax system reflects the Norwegian desire to reduce the use of pesticides, especially those with the highest potential risk to human health and the environment. They hope the higher tax on higher risk pesticides will make the farmers choose more health and environmentally friendly alternatives, or at least review the economic thresholds for pesticide treatment. The three current tax classes for pesticides for professional use in Norway have the following factors: 1 – 4 – 8. A basic tax of Norwegian Kroner (NOK) 20 *per* hectare is given (about 2.4 €). To calculate the tax *per* hectare for each product, the basic tax is multiplied with the tax class factor. A pesticide in tax class 2 (low health and environmental risk) will have a tax of NOK 20 *per* hectare (20 x 1 = 20). A pesticide in tax class 4 (high health and environmental risk) will have a tax of NOK 160 per hectare (20 x 8 = 160). If the standard area dose (SAD) of the examples are 750 ml/hectare, the tax per litre will thus be NOK 26.7 (20 x 1 x 1000/750) and 213,3 (20 x 8 x 1000/750), respectively. Seed treatment pesticides have a factor of

0.5. Concentrated hobby products (*i.e.* for amateur use) have a factor of 50 and ready to use hobby products have a factor of 150. Norway also raises a standard levy of NOK 16 per hectare for all pesticides sold, which goes to cover the costs of testing, control and the registration process.

In each country the tax is paid directly by the agrochemical distributor. In Norway, this means it is paid by the importer (or by the manufacturer for the few products produced nationally).

## *Impact of taxation in the context of pesticide reduction*

In Denmark Treatment Frequency has been reduced from 2.67 in 1981-85 to 2.10 in 2001-2003 (21% decrease). Impacts in terms of quantitative reduction in water pollution are difficult, if not impossible to make. Most pesticides found in Danish groundwater today are, in fact, active ingredients now banned or with restricted use. However, glyphosate has been found in groundwater in clay soils, and farmers are advised not to spray closer than 25 meters from their water drillings. Danish government and NGO colleagues view taxation as a contributor to pesticide use reduction, estimated to have reduced the use of pesticides by 5%.

In contrast, Swedish officials believe their taxation has had minimal or zero impact on the amount of pesticide used. Data on pesticide use in Sweden show no overall decrease in the volume of pesticides used over the period 1991-2002 (3), but farmers increased their purchases of low-dose pesticides, *i.e.* those that are biologically active at very low concentrations *per* hectare. When analysed in terms of the number of doses sold, official data shows a definite increase since 1995, in other words, no reduction in the intensity of pesticide use. However, the Swedish Farmers Federation argue that pesticide load on the environment has decreased, from analysis of pesticide levels in one river studied which decreased significantly from 1995 (4). The reason they attribute to this reduction is the concerted effort made by the SFF and others in farmer advice and training in that region, which led to changes in farmers' practice.

In Norway since the mid-1980s, there has been a steady decrease in the use of pesticides (measured as tonnes of active ingredients) to about 50%. The implementation of the new banded tax system in 1999 and a further tax increase in 2000 led to a massive stockpiling of pesticides in 1998 and partially in 1999, in anticipation of the taxes to be imposed! The imports in 2000 and 2001 were correspondingly lower. Because of these large variations, Norwegian officials say it is too soon to see a clear trend in the amounts imported and in the risk indicators.

It should be noted that it is extremely difficult to separate out impact of taxation on pesticide use patterns from other factors influencing farmers' purchase and use decisions, either those forming part of a pesticide reduction programme or those linked to broader agricultural or market trends.

In terms of revenue raised, Norway's pesticide tax raises about NOK 60 million (7.2million euro) a year. About one third of this is directly routed back through the reduction programme. Denmark does not provide numerical figures but 75% of tax revenue goes back to farmers in lower land taxes and the rest is used in pesticide use reduction programmes and in research into pesticide effects. In recent years some parts of the Swedish tax revenues have been used to finance farmer-driven research related to risk reduction.

## *Farmer advice, perceptions and changes in pesticide practice*

Danish officials and NGOs highlight the importance of independent and credible advice for farmers on pesticide reduction and pest, disease and weed management by the Danish Agricultural Advisory Service (DAAS). The cost is not quantified, because it is an integral part of the advisory service, an independent organisation almost 100 years old, which is paid for by the farmers and accountable to them. DAAS, as part of the pesticide action plan, has set up innovative farmer training and mentoring groups (5) to assist farmers to develop pesticide reduction plans at farm level and to use the TFI system as a planning and monitoring guide for progress in reducing their consumption of herbicides, fungicides and insecticides on specific arable crops (6). However, not all Danish farmers make use of this service and there are considerable challenges for the new phase of the plan (7).

Farmer advice and training in Norway includes mandatory training of farmers, development of IPM guidelines and warning services for specific plant pests and diseases. There has also been an information campaign on health effects of pesticides.

Swedish farmers are required to attend a 3 day training course and there is a voluntary programme for testing of spray equipment. Advisory services include forecasting and warning services, demonstration trials, information on how to reduce dosage rate, supported by research on needs-based crop protection, spray techniques and organic methods.

## *Farmer reactions*

Danish NGOs report that their farmers generally accept pesticide taxation, although they don't love it! A key element in persuading acceptance has been the clearly visible return of 75% directly to farmers in the form of lower land tax and transparency in the remainder, which funds action plan programme activities and research. The Danish Agricultural Advisory Service has worked hard to demonstrate with concrete figures from on-farm trials the cost savings achieved via use reduction in specific crops, to convince farmers that using the higher levels of pesticides applied by farmers in Germany, UK, and to a lesser extent in Sweden, will not bring them economic benefits.

In Sweden, the reduction programme has the full support of the Swedish Farmers Federation, to which 80% of farmers are affiliated. A spokesperson for the SFF explained that understanding farmers' perceptions is crucial in order to counteract misperceptions or incorrect information, for example, widely-believed myths that no Swedish farmer has ever been killed by pesticide poisoning, or that any pesticide authorised for use by the Swedish regulators is completely safe (8).

Norwegian farmers have had mandatory certification in pesticide use since 1997, which must be refreshed every ten years although farmers can choose to attend refresher courses before then. Inspection of spray equipment became compulsory in 2001, for a five year period, and pesticide log books in 1999. Since 2000, the training programme on good plant protection practice has been intensified and now includes further information on biology and agronomy, pesticides and alternatives, spray techniques, Integrated Pest Management guidelines, threshold values and organic methods. Both Norway and Sweden use the term "environmental levy" instead of tax. Clear hypothecation of at least part of the revenue is viewed by Norwegian officials as very important for stimulating farmers to change their attitude and practice to more environmentally friendly methods. In 2002, 2.5 million euro equivalent was reimbursed indirectly to Norwegian farmers via risk reduction programme activities. The farmers associations have been part of the action plan working group that initiated the work on a levy system banded by health and environmental risk. The farmers seem to agree with the principle that higher risk pesticides should have higher taxes than low risk pesticides.

## *Economic impacts*

70% of Norwegian farmers surveyed said that the new tax system has led to higher costs. This is a result of the fact that the total tax level has been increased at the same time as the implementation of the banded system. About 40% of farmers surveyed said that the banded tax system had made them use pesticides that are less harmful for human health and the environment. Looking at the area treated by pesticides in the different tax classes, there appears to be a reduction in tax class 3 and 4 (medium and high environmental impact) and an increase in tax class 2 (low), but it is too soon to draw safe conclusions.

Danish government and NGOs, however, are adamant that their tax system has only reduced use of pesticides, with zero or only very low negative economic consequences for farmers. Changes in practice are use of reduced doses and notably less calendar spraying. Economic analysis in 2003 studied current crop and pesticide prices and records of around 2,000 farmers' application of pesticides during 1999-2003. The research confirmed the intentions of the pesticide action plan to reduce farmers' costs, estimating that Danish farmers will gain an overall benefit of around 13 euros per ha if they further reduce their application frequency from a TFI of 2.0 to 1.7, a reduction of 15% (9). With 2.5 million ha under arable crops in Denmark, this is equivalent to a total of 30 million euros saved in direct costs of farmers.

## *Difficulties encountered with pesticide taxation and recent modifications*

Denmark has not encountered real difficulties with their tax scheme but it has been criticised that as an *ad valorem* tax, it is lower on cheaper, older pesticides than on newer, more expensive ones. Likewise,

the tax is not related to pesticide hazards. A tax on Treatment Frequency has been considered, but it was impossible to implement because a specific pesticide is used at different dose rates in different crops. The former centre-left government planned in 2001 to raise the tax, but this was then cancelled by the new centre-right government. Under the latest action plan target to reduce TFI to 1.7 in 2009, the government said in 2003 that if this target is not reached by voluntary means, it will take other measures to reach it, for example via a higher tax.

Norway continues to revise its tax classification system. A further refined version of the banded tax system will be used from October 2004. The main objectives to achieve via the changes are:

- A more continuous tax scale. The new system will have three health and environmental classes (two in the old system), and 5 tax classes for the pesticides used professionally (3 in the old system);
- An environmental part that takes the sum of environmental load/risk into account (not just if one threshold value is exceeded). Each product is given environmental scores based on the following parameters: risk to earthworms, arthropods, birds and aquatic organisms; leaching potential; persistence; bioaccumulation potential; and formulation type. The sum of scores defines the environmental class;
- To differentiate seed treatment pesticides based on potential health risk;
- To make the tax system and the risk indicators more similar.

## *Taxation in the broader EU context*

PAN Europe demands in PURE (Pesticide Use Reduction in Europe) campaign include concrete targets and legally-binding measures for pesticide use reduction (10). Our demands also include financial support for implementation of Integrated Pest and Integrated Crop Management and other measures to reduce pesticide use. Part of this funding could be provided through a pesticides tax but we did not consider what form this should take.

In its reaction to the Commission Communication Towards a thematic strategy for the sustainable use of pesticides, the EU Economic and Social Committee considers a levy on pesticides a sensible way for funding measures to reduce environmental and health risks, although recommends the Commission to seek to ensure that non-EU countries introduce a similar levy in order to avoid distortion in the markets (11). On the other hand, the Council conclusions asked the Commission to "*consider the potential for economic instruments at all appropriate levels as one of the means to achieve sustainable use of pesticides*" (12). The European Parliament conclusions were far more challenging and called on the Commission to "…*develop a regulatory framework for taxes and/or levies on pesticides; the revenues raised should be used to support conversion to IPM, ICM and sustainable organic farming methods, education and training, to raise awareness and to finance research*" (13).

In the Extended Impact Assessment entitled "Assessing economic impacts of the specific measures to be part of the Thematic Strategy on the Sustainable Use of Pesticides", the option "*introduction of general use reduction target*" was eliminated on the basis of what PAN Europe considers a superficial and defective evaluation of the efficiency of the Danish reduction plan. The assessment focussed almost exclusively on the costs to farmers and other private sectors of pesticide reduction measures, with very scant mention of benefits to society in improved health and environment, or of possible economic benefits to farmers! Although severely criticised by PAN Europe, the report recognises that introduction of a tax might have good results for the enhanced protection of water by taxing particular pesticides that are found above the threshold limit in water resources.

Belgium started recently a Federal Programme for the Reduction of Pesticide Use in Agriculture and Biocides. The programme includes a tax on pesticides and biocides with the main purpose of financing the programme. Based on their impact on health and environment, the substances are attributed a certain category of danger. The total number of points depends on the category of danger multiplied by the quantity of the product sold the previous year and converted into a contribution. The total value (points x quantity) of all PPPs and biocides will take into consideration the total annual budget estimated for the programme worth 500,000 €. The Programme stipulated that a simulation made with data from 2003 sales should be submitted to the companies holding authorization permits by the end of 2004 in order to

calculate contributions (14). Until now, we have no information that this process has been completed. In general, the programme is yet to be implemented. Some meetings of the National Steering Committee have been held but there is no implementation of its conclusions or of any of the measures envisaged in the Federal Programme.

Germany's Federal Plan for Pesticide Reduction was approved in March 2005 but doesn't consider any form of taxation. The objectives are: reduction of risks associated with the application, reduction of the Application-Intensity of PPPs and reduction of the amount of food exceeding Maximum Residue Levels (MRLs) to less than 1%. The Federal Programme is conducted and supported by the Central Bureau (Reduction Programme Chemical Plant Protection) and the Federal Biological Research Centre for Agriculture and Forestry but there will be no additional funds for its execution. Another drawback is the fact that a key instrument in the Programme – to strengthen the advisory services – will be progressively handed to the pesticide industry. Therefore, we do not expect the Programme will lead to a change in the plant protection system and the implementation of the precautionary principle.

In Italy, a flat tax of 0,5% was introduced in January 2000 (Law No 488/99) to all pesticides manufactured and sold with the following risks: R33 ("with risks of cumulative effects"), R40 ("limited evidence of carcinogenic effect", R45 ("may cause cancer") and R60 ("may impair fertility"). In the case of pesticide imports, a flat tax of 1% over the final price was introduced. The income raised by this levy is used to develop organic farming and quality products. Under the Ministry of Finance, the Italian Government created a "Fund for the development of organic farming and quality products" in order to finance the following measures under the national and regional programmes:

a) financing research and experimenting on low environmental impact agriculture;
b) supporting promotion and information campaigns on organic agriculture, regional products and PDO (Protected Designation of Origin);
c) producing, revising and publicising the code for good agricultural practise.

However, not all the income raised by the pesticide tax has been used; 5million EURO was allocated to the national plan for organic farming but this plan is still to be implemented.

## *Conclusions*

A 1999 study of general environmental taxation in European countries (15) looked at the Swedish, Danish and Norwegian pesticide taxes and concluded that they were too low to have much impact on farmer behaviour, but cautioned that raising the levels significantly could be politically difficult, might reduce farmers' income, disadvantage them competitively or encourage illegal purchase of pesticides in order to avoid taxation.

While it is true that a flat tax treats all active ingredients the same whether they cause high or low external costs from environmental and health damage, the impact of a banded system based on intrinsic hazard or on estimated environmental damage can be hard to predict if farmers shift from one product type to another. It may not necessarily bring about the desired changes if other factors also influence farmer decisions. A flat tax on volume is certainly not advisable as this merely encourages a shift from high to low volume products. There are many uncertainties about the long-term health and environmental effects of the newer highly-active pesticides used at very low dose, as well as other products still on the EU market (16). There may also be trade-offs to consider under a banded system- which should be prioritised, for example, avoidance of water contamination or penalising products containing suspected endocrine disruptors?

A flat tax on price is often criticised in that it may result in farmers shifting to cheaper but more hazardous products. In the Danish case, many of these older generation products had already been withdrawn from national markets and officials and NGOs agree that there is no evidence of a shift towards more hazardous products by Danish farmers. The importance of the national pesticide action plan and advisory support to farmers cannot be overemphasised in this context.

Another study on environmental taxes and charges in the EU (17) concludes that an important aspect of pesticide charges/taxes has been their capacity to raise revenue to support national programmes for pesticide reduction. This has clearly been important in Denmark and Sweden where some support has been channelled to organic farming. Both countries now have a significant organic agricultural sector. PAN Europe also defends that a tax on pesticides should be used in order to finance alternative pest

control systems less dependent on pesticides such as IPM/ICM and organic farming and is an important part of any national programme for pesticide reduction.

The key ingredients identified by PAN Europe for successful incorporation of pesticide taxation for use and risk reduction goals are:

- ✓ Clear and direct reimbursement of substantial tax revenue to farmers and/or advisory services;
- ✓ Importance of independent advice on means to reduce use and alternative strategies for managing pests, weeds and diseases;
- ✓ Clear demonstration of economic benefits at farm level of reducing use;
- ✓ Taxation complements a wide range of pesticide reduction measures, mandatory and voluntary, at farm and national levels;
- ✓ Progressive farmer associations need to be involved, with other stakeholders, in the planning stages of the tax system to ensure a minimum level of acceptance.

These issues of transparency; clear hypothecation of revenue; serious political commitment to an ambitious programme for reducing pesticide use and dependency; energetic promotion of independent advice for farmers; and convincing stakeholders, particularly farmers, of the economic benefits as well as the costs of such a programme, must be addressed in any discussion of introduction of a pesticide tax at the Member State level.

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This briefing is based on PAN Europe's survey work on pesticide reduction programmes in Denmark, Sweden, Norway and Netherlands (1) and responses to a separate questionnaire sent to collaborators in Denmark, Sweden and Norway. In Norway we would like to thank Erlend Spikkerud in the Pesticides Division of the Norwegian Food Safety Authority and in Sweden, Peter Bergkvist of the National Chemicals Inspectorate (KEMI) for information provided. Updates on the Danish situation were provided by Hans Nielsen (Danish Ecological Council and PAN Europe Board member). Information on the Belgian and German Federal Programmes was provided by PAN Europe Belgian, German and Italian members. Unless otherwise referenced, factual information presented in this report is from the above sources.

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