PAN Germany

From Law to Field

Pesticide Use Reduction in Agriculture - From Pesticide Residue Analyses to Action

(Executive Summary)

Hamburg, May 2002

Pesticide Action Network (PAN)

Founded in 1982, the Pesticide Action Network is an international coalition of over 400 citizen groups in more than 60 countries working to oppose the misuse of pesticides and to promote sustainable agriculture and ecologically sound pest management.
PAN Germany was established in 1984 as part of this global network and has continually been involved in initiatives to reduce the use of hazardous pesticides and to promote sustainable pest management systems on national, European and global level.

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From Law to Field
Pesticide Use Reduction in Agriculture - From Pesticide Residue Analyses to Action

This publication contains the Preface and the Executive Summary of the PAN Germany Study "From Law to Field: Pesticide Use Reduction in Agriculture - From Pesticide Residue Analyses to Action". The complete study is available on the PAN Germany website (www.pan-germany.org) under downloads.

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Preface

"One of the effects of intensive agricultural production in the Union is the pollution from plant protection products, which threatens groundwater, surface water, soil and air quality. These environmental problems appear to be more than local in nature, subsequently affecting a substantial number of EC Member States."

J. Currie (Director-General, European Commission, DG XI, 1998)[1]

Founded in 1982, the Pesticide Action Network (PAN) is an international coalition to oppose the misuse of pesticides and to promote sustainable agriculture and ecologically sound pest management. PAN Germany was established in 1984 as part of this global network and has continually been involved in initiatives to reduce the use of hazardous pesticides on national, European and global level. In co-operation with PAN UK, PAN Germany is facilitating organisation of PAN Europe. Thus, a focus of its activities has always been the European pesticide policy.

In 1993, the 5th Environmental Action Programme (EAP) was adopted by the EU Commission. One aim of this programme was to considerably reduce the use of agricultural pesticides by the year 2000. This objective has not been achieved. According to European pesticide market data, pesticide use in agriculture remains high. In 1998 for example, 322.000 tons of active ingredients for use in agriculture were sold in Europe. This was an increase of 13 % compared to 1995. More recent data on the pesticide market are not avail-

1 Opening speech by J.Currie, Director-General, European Commission, DG-XI, Environment Nuclear Safety and Civil Protection at the Second Workshop on a Framework for Sustainable Use of Plant Protection Products in the European Union, Brussels, Belgium 1998

able, although the 5th EAP intended to establish a system that provides detailed and up-to-date data.

Today, the consequences of a high input of pesticides into the environment cannot be ignored. As numerous monitoring programmes have shown, pesticide residues can be found in ground-, rain-, and surface water, soil, air, food, animal and human tissue worldwide. It is a common understanding, though, that pesticides do not belong in food, water and air and that wildlife and humans need to be protected from pesticide exposure.

The 6th EAP, which sets out major priorities and objectives for environment policy until 2010, acknowledges this serious and growing pesticide problem. It calls for a Code of Good Practice on pesticide use and the uptake of low input or pesticide free agriculture. However, there is no deadline for implementation before 2007 and no definition of the statutory framework of these objectives. Considering these drawbacks as well as the tremendous delays in implementing the 5th EAP, serious commitment of all EU Member States is necessary in order to meet the ambitious goals of the 6th EAP as soon as possible.

The PAN Germany project "From Law to Field - How to put pesticide use reduction into practice" strives to facilitate the aim of the 5th EAP and 6th EAP by data analyses, capacity building, public awareness raising and lobbying. The project is divided into two areas:

(1) The analysis of pesticide use in agriculture on the basis of residue data in order to develop crop specific measures for an effective pesticide reduction. The results are documented in this publication.

(2) Dissemination and discussion of the results of the first project area among expert groups, multiplicators, concerned actors and the public.

Executive Summary

The study "From Law to Field: Pesticide Use Reduction in Agriculture - From pesticide residue analyses to action", which was developed within the PAN Germany project "From Law to Field - How to put pesticide use reduction into practice", points out the importance of a crop specific approach and of the commitment of political and economic stakeholders as well as consumers for achieving a pesticide use reduction in Europe.

Since patterns and modes of pesticides use, as well as the profile of unwanted side effects of chemical plant protection, differ from country to country and even from place to place, this study concentrates only on German research and data. However, the study provides a framework for analyses and action applicable to other crops and countries in the EU.

In November 1998, the German Federal Ministry of Agricultural constitutionally defined principles for good plant protection practice. This definition is quite general, though, and does not include crop specific guidelines. Therefore the PAN Germany study worked out crop specific plant protection principles and additionally developed strategies for pesticide use reduction beyond the farm level. The study consists of a 3 parts:

(1) the documentation of pesticide residues in food and the environment (part 1: Residue Study)

(2) the evaluation of these pesticides residues regarding their impact on human health and the environment (part 2: Risk Study), which allows the selection of priority crops for further investigation

(3) the development of crop specific measures for pesticide use reduction for the priority crops apple and wheat (part 3: Apple and Wheat Case Studies)

Part 1: Residue Study

This study documents German pesticide residue data for surface water, groundwater and 17 vegetable food items of German origin, covering the period of 1997 through 2001. Since pesticide use data organised by crop and active ingredient are unavailable in Germany, these residue data were used as a reflection of the current plant protection practice.

The data document 119 different pesticide residues including 58 in food, 59 in surface water, and 61 in groundwater. 52 of these pesticides were used as herbicides, 44 as insecticides, 20 as fungicides and 4 are for other purposes.

Only 58 of the 119 active ingredients are still authorised for use in Germany and for 7 of these the authorisation will expire within the next years.

Part 2: Risk Study

Based upon the findings presented in the Residue Study, a qualitative assessment was carried out taking into account:

(a) the toxicological classification of the detected pesticide residues according to nationally and internationally recognised risk classifications as those of the World Health Organisation (WHO), the European Union (EU) and the U.S. Environmental Protection Agency (U.S. EPA)

(b) the area of land covered by the crops, on which the pesticides were used.

The study only considered the 51 detected active ingredients, which are still authorised in Germany throughout the next years. The toxicological classification led to the result that most pesticides, which were found as residues in food and/or water, are dangerous to human health and the environment.

A ranking within the list of the 51 pesticides showed that the five most dangerous residues were dimethoate, chlorpyrifos, cypermethrin, cyfluthrin and lambda-cyhalothrin.

The results of the ranking were linked to the crops, on which the pesticides were used. Celery and spinach had the most toxic residues on average, while apple and wheat contained the highest number of residues. Apples and wheat were chosen as case studies because the crops have a high number of residues associated with their cultivation, are grown on a large scale, and represent different production systems.

Part 3: Case Studies on Apples and Wheat

Part 3 deals with the two crops selected for more detailed investigations.

The case studies describe the methods of conventional, integrated and organic crop protection in apple and wheat cultivation. They then evaluate obstacles and potentials for a pesticide use reduction in these crops. These include not only plant protection and crop production measures, but also factors beyond the farm level like fruit marketing and consumption patterns.

Apples

The apple case study showed that the almost complete transition from the very pesticide intensive conventional methods towards Integrated Pest Management (IPM) techniques in German apple orchards resulted in a first reduction of pesticide use in Germany. However, IPM techniques are still characterised by a high amount of pesticides used and by the application of many different pesticides.

In contrast, organic apple production does not use any herbicides and applies only biological formulas against insects. But fungal diseases like apple scab demand for the intensive use of sulphur and copper preparations in organic apple orchards. Especially copper is problematic regarding its environmental impacts.

Therefore a further pesticide use reduction on IPM farms as well as on organic farms can only be expected if scab resistant or scab tolerant apple varieties are cultivated. On the one hand, there are newer varieties that have been bred to meet these criteria, on the other hand, there are many old, regional varieties that are particularly pest resistant under their local soil and climate conditions.

The transition towards the cultivation of these apple varieties will only take place if measures are implemented also beyond the farm level. Important protagonists are for example European politicians who set quality standards for the fruit trade and retailers as well as supermarkets who are constituting the demand chain. Through their daily consumption choices, consumers also have a strong influence on which apple varieties farmers produce.

Wheat

The wheat case study indicated that prospects for reducing pesticide use through changes in plant protection measures are far greater for wheat than for apple production. Although the German plant protection law stipulates since 1986, that IPM principles should be applied in agriculture, IPM techniques have not been widely implemented yet on wheat crops in Germany.

Pesticide use, though, could be reduced without risking economic losses by the application of simple preventative practices of the IPM system such as diverse crop rotation, changing the timing of seed sowing, reduced application of nitrogenous fertiliser or pesticide application only if certain damage levels are exceeded. This knowledge still needs to be disseminated to farmers and to extension services on a broader scale.

A transition from conventional wheat cultivation to the IPM system can prevent some pesticide applications, but the highest reduction potential is the transition towards organic wheat production because it does not use any synthetic pesticides.

At present, the area under organic wheat production is limited and must grow in order to show a marked reduction effect in pesticide use. Like for apple production, measures beyond the farm are necessary in order to support the transition towards organic wheat production in Germany. These are for example a financial support for conventional farmers who want to convert to organic farming and the development of market instruments to make organic wheat and its secondary products like eggs, milk and meat more attractive to consumers.

Conclusions and measures

This study showed that measures for a pesticide use reduction are only effective if they are

1. crop specific and

2. incorporate parties beyond the farm such as politicians, food retailers and consumers.

It demonstrated in particular that

- the potentials of the different plant protection methods (IPM or organic) for pesticide use reduction depend on the particular crop and that the crop specific measures vary considerably.
- pesticide residue data are not an appropriate basis to develop, monitor and evaluate crop specific pesticide use reduction strategies. Therefore a reporting system for crop and site-specific pesticide use data needs to be implemented.
- it is an important task to convince consumers that without a change in their consumption patterns both, a considerable pesticide use reduction and an increase in organic production will not take place.
- the commercial sector such as retailers, shopkeepers and supermarkets play a crucial role through their marketing patterns and advertisement.
- politicians should change the EU-fruit standards that put down e.g. exaggerated claims on fruit skin quality, which can only be met by intensive pesticide use. Additionally, national and international subsidies for organic production should be raised in order to lower the prices of organic products. This would also reflect the society's need for environmentally sound and sustainable agriculture.
- regardless of the production system and the crop, further research needs to be done on how to facilitate a development towards environmentally sound and cost efficient crop production in Europe.