PAN
Germany

Moving towards Pesticide Reduction

...realising Best Agricultural Practice in Central and Eastern Europe

Hamburg, 2004

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Pesticide Action Network (PAN)

Founded in 1982, the Pesticide Action Network is an international coalition of over 600 citizens 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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List of Acronyms

ai	active ingredient
APS	Assured Produce Scheme
BAP	Best Agricultural Practice
CAC	Codex Alimentarius Commission
CAP	Common Agricultural Policy
CEEC	Central and Eastern European Countries
EC	European Commission
EISA	European Initiative for Sustainable Development in Agriculture
EPPO	European and Mediterranean Plant Protection Organization
EU	European Union
EUREP	The Euro-Retailer Produce Working Group
FAL	German Federal Agricultural Research Centre
FAO	Food and Agriculture Organisation of the UNO
GAP	Good Agricultural Practice
GEF	Global Environment Facility
GFP	Good Farming Practice
GPP	Good Plant Protection Practice
ICM	Integrated Crop Management
IEEP	Institute for European Environmental Policy
IFS	Integrated Farming Systems
IFOAM	International Federation of Organic Agriculture Movements
IOBC	International Organisation for Biological and Integrated Control of Noxious Animals and Plants
IPM	Integrated Pest Management
MS	Member State
NGO	Non-governmental organisation
RDR	Rural Development Regulation
SAPARD	Special Assistance Programmes for Agricultural and Rural Development
TF	Treatment Frequency
UNDP	United Nations Development Programme

1 Introduction

The political change in Central and Eastern European (CEE) countries 15 years ago had a deep impact on agriculture. The centrally planned economy broke down and market economy developed. State collective farms and industry collapsed and were privatised. In the transition period the agricultural production declined extremely and use of input dropped significantly.

In some countries for example Romania and Bulgaria privatisation of agricultural land and high un-employment in the cities led to a migration from the cities to the countryside. Millions of small farms were established and their semi-subsistent economies relieved state budgets and prevented starvation and hunger on a larger scale. In some countries the situation is different. In Poland for example land stayed in private hands during the communist period, but small scale farming still dominates. In the Czech Republic 76% of the agricultural land is now cultivated by farmers with holdings over 500 ha.

PAN Germanys' Publications:
This brochure is part of PAN Germanys' Project on NGO capacity building on Central and Eastern European Countries (CEEC).
A series of publications about pesticides in ***Hungary, Poland, Slovenia*** *and the* ***Czech Republic*** *were published in 2003.*
These four publications focus on the evaluation of authorised pesticides regarding their human and environmental toxicity.
More information on pesticide regulation in the European Union and a critical review can be found in PAN Germanys' ***Pesticide Action Handbook****, which is also available in Russian and Polish.*
Separate publications on the ***PIC*** *and* ***POPs Convention*** *were published by PAN Germany in English, German, and Russian. All publications are available at:*
www.pan-germany.org

Many of the small farmers in CEE countries are not professional farmers, during communist times they often had jobs not related to agriculture, and many of them are aged. Insufficient education and little environmental awareness lead to many 'bad agricultural practices'. Even if pesticide use per ha is low compared to Western European countries, the impact on health and environment may be higher. Improper use and trade in illegal, often unlabelled pesticides endangers the well being of farmers and their natural environment. Data on the scale of illegal trade are not available and data on residues in food, soil and water are often not available to make an adequate judgement.

The EU accession this year and 2007 will again have a deep impact on agriculture in CEE countries. Agricultural production is likely to be intensified with negative consequences on the environment and rural development. However, the current EU CAP reform, especially the requirements of state advisory service, cross compliance and more funds for rural development and organic agriculture, present a good chance to change 'bad agricultural practices' into good and best practices.

Whilst EU accession also offers an opportunity for sustainable agriculture to some countries in the CEE region it still requires political vision and commitment. Knowledge about the policy instruments available under the CAP, the flaws and gaps of EU pesticide policy and 'western' agricultural concepts is needed to avoid a further shift to industrial farming. NGOs have the power to influence national and European policy and to press decision makers to move towards pesticide reduction and sustainable agriculture.

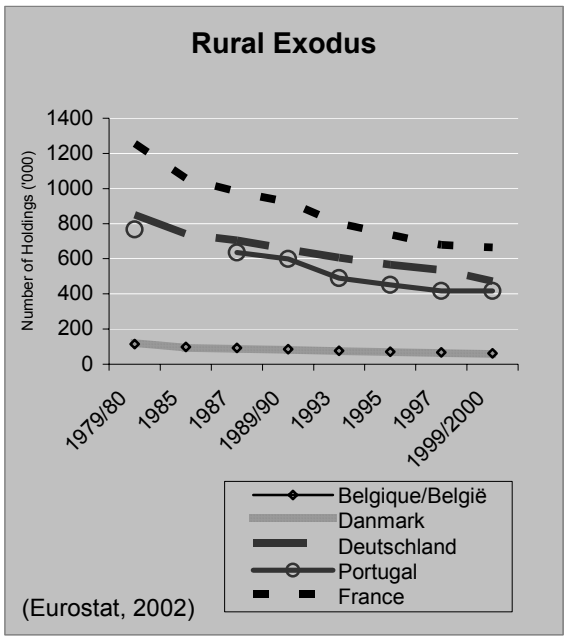
Pesticide Action Network (PAN) therefore strives to strengthen the capacity of CEE NGOs through information outreach on pesticide policy and policy instruments. This brochure, however is not limited to future EU Member States, most of the mentioned concepts and political requirements are applicable in all CEE countries.

The brochure presents an overview on different concepts such as Good Agricultural Practice and Integrated Crop Management, which have been developed to make conventional farming more sustainable. In order to move farmers away from ‘bad practices’ to good and best practices, the concept of Best Agricultural Practice as a vision towards pesticide reduction and sustainable agriculture is introduced.

Organic agriculture as an alternative production system is illustrated and the need for more conversion is stressed.

2 Conventional Agriculture

Conventional farming in common European understanding means high-input (industrialised) agriculture focusing on high yields, productivity and profits. Intensification, specialisation and concentration are the concepts to achieve profitability. This has resulted in environmental problems such as pollution of water by nutrients and pesticides and loss of habitat and associated biodiversity, but also in socio-economic consequences such as 'rural exodus' (Pouliquen, 2001) and dramatically decreasing producer prices. The right box shows the decrease of the number of farms in 5 Western European countries since 1979/80 (Eurostat, 2002).



Conventional farming understood in this way developed on a large scale after 1945 in Europe and the USA and with the so called Green Revolution in the 70's in the South.

Negative side-effects of conventional agriculture lead to the emergence of new concepts and policy instruments in this system, such as: Good Agricultural Practice (GAP), Good Farming Practice (GFP), Cross-Compliance, Good Plant Protection Practice, Integrated Agriculture, Integrated Production (IP), Integrated Farming Systems, Integrated Crop Management (ICM) and Integrated Pest Management (IPM). For all these concepts, scientists, non-profit organisations but also commercial organisations and retailers have published a large number of definitions and guidelines. Some of these concepts can be used interchangeably, some build a framework for another concept.

Figure 1 illustrates the relationship between Integrated Farming Systems (IFS) and Integrated Pest Management (IPM).

Integrated Agriculture, Integrated Production (IP), Integrated Farming Systems (IFS) can be used interchangeably, they represent a whole farm approach, where each individual enterprise is integrated with the others to produce benefits through their mutual interactions (Agra CEAS

Figure 1: Components of Integrated Farming Systems (Agra CEAS Consulting, 2002)

Consulting, 2002). Integrated Crop Management (ICM) and Integrated Pest Management (IPM) are components of Integrated Farming Systems (IFS).

The concepts Good Agricultural Practice (GAP), Good Farming Practice and Good Plant Protection Practice (GPP) can theoretically include IFS, ICM and IPM, but there is no common or legally binding definition for these concepts. The next chapters describes some of these concepts and show some examples.

2.1 Good Agricultural Practice (GAP)

In a broader definition, GAP applies recommendations and available knowledge to addressing environmental, economic and social sustainability for on-farm production and post-production processes, resulting in safe and healthy food and non-food agricultural products (FAO, 2004).

Usually, a GAP concept refers to objectives. The Food and Agriculture Organisation of the UNO defined, for example, a Good Agricultural Practice (GAP) in the use of pesticides. This includes the officially recommended or nationally authorized uses of pesticides under actual conditions necessary for effective and reliable pest control. It encompasses a range of levels of pesticide applications up to the highest authorized use, applied in a manner which leaves a residue which is the smallest amount practicable (FAO, 2003). This ‘smallest amount practicable’ - the pesticide residue left in a treated commodity after GAP is the base for the calculation of the daily pesticide intake and eventually for the establishment of *maximum residue levels* (MRL).

The GAP definition of the FAO could also be called ‘Current Agricultural Practice’ because it just represents national legislation. In cases where extremely toxic pesticides in high application rates are nationally authorised, their use is, according to the FAO still Good Agricultural Practice. Bad legislation which may endanger farm workers or the environment is therefore not reflected in the FAO GAP concept.

However, the FAO just started a consultation process of reviewing existing GAP models and new GAP policy recommendations are to be expected (FAO, 2004).

On EU level GAP has not been defined for the use of pesticides, but it is the basis for the calculation of maximum residue levels (MRL). In addition, the EU requires that pesticide must be used properly. ‘Proper use’ includes, according to the EU the application of GAP (in this respect Good Plant Protection Practice), but the EU fails to deliver a definition and legislation to make this definition binding.

How codes of GAP could work for the protection of the environment is shown by the EU Nitrate Directive 91/676/EEC. The directive requires that Member States define codes of Good Agricultural Practice for the use of fertilizers based upon certain provisions as defined in Annex II, and requires a programme for implementation of the prescribed codes. (EC, 1991a).

A more precise definition of a Good Agricultural Practice (GAP) in the use of pesticides has been developed by the European and Mediterranean Plant Protection Organization (EPPO). EPPO is an intergovernmental organisation embodied by national plant protection agencies. The GAP developed by EPPO is called Good Plant Protection Practice (GPP) and contains generic principles (see box) as well as crop specific guidelines for some 30 crops in the European and Mediterranean region. *"EPPO guidelines on good plant protection practice (GPP) are intended to be used by National Plant Protection Organizations, in their capacity as authorities responsible for regulation of, and advisory services related to, the use of plant protection products"* (EPPO, 2000). EPPO is therefore the main body in influencing national GPP guidelines.

EPPO General GPP Principles comprise:

1. Crop factors and cultural control
2. Local pest spectrum and thresholds for action
3. Conditions of registered use of plant protection products
4. Choice of active ingredients
5. Choice of dosage
6. Number, timing and frequency of applications
7. Equipment and methods of application
8. Biological means of control
9. Identified side-effects
10. Resistance
11. Safety
12. Training and documentation

For each major crop of the EPPO region, the guidelines cover methods for controlling pests, pathogens and weeds. For each, details are given on biology and development, appropriate control strategies are described, and examples of active substances which can be used for chemical control are mentioned (EPPO, 2000).

As a body of governmental organisations it is not surprising that EPPO is not very critical towards the use of chemicals as long as they are registered. EPPO does recommend usage of extremely toxic pesticides and considers use of herbicides and growth regulators as normal.

However, the approach to describe pests, pathogens and weeds for all major crops and to suggest basic non-chemical strategies embarges large potential for pesticide use reduction.

Commercial GAP

There is increasing interest shown by farmers, the food industry and food retailers in EU Member States to establish their own GAP or "on-farm quality assurance schemes" that offer consumers the assurance of food products having been grown with reduced or minimal pesticide inputs.

The Euro-Retailer Produce Working Group (EUREP) for example has developed a set of standards and procedures for inspecting and certifying fruit and vegetable farmers who follow EUREP Good Agricultural Practice (GAP).

The EUREPGAP initiative is a set of normative documents suitable to be accredited to international certification laws. Representatives from around the globe and all stages of the food chain have been involved in the development of these documents and it has produced a robust, challenging protocol which focuses the producer on the key issues that need to be addressed during the pre-farm-gate stage. For EUREP GAP *"is a means of incorporating Integrated Pest Management (IPM) and Integrated Crop Management (ICM) practices into the framework of commercial agricultural production. Adoption of IPM/ICM is regarded by EUREP members as essential for the long-term improvement and sustainability of agricultural production."* (EUREPGAP, 2001)

Assured Produce Scheme (APS) a UK fruit and vegetable marketing organisation for some 3.600 farmers (ca. 211.000 ha) is EUREP GAP member and developed besides the generic protocol, which is similar to EPPO, crop specific guidelines for GAP, including pest and disease specific IPM/ICM measures (APS, 2003a, 2003b). Crop specific codes of GAP are, however, not required by EUREP (EUREP, 2004).

Besides the concept of Good Agricultural Practice, there is also the concept of 'Good Farming Practice' (GFP).

2.2 Good Farming Practice (GFP)

The term Good Farming Practice (GFP) emerged first with the implementation of the agri-environment Regulation No 2078/92EC after the MacSharry reform of the European Common Agricultural Policy (CAP) in 1992.

Good Farming Practice, according to the EC, '*comprises observance of regulatory standards and an exercise of care which a reasonable farmer would employ'* (EC, 1998).

'...as a minimum, farmers should respect general requirements as regards environmental care without specific payment. This means that all farmers should follow compulsory laws in relation to pesticide use, to fertiliser application, water use and where appropriate, national or regional guidelines on good farming practice' (EC, 2000a).

The EU Rural Development Regulation (RDR) in 1999 defines GFP as *'the standard of farming which a reasonable farmer would follow in the region concerned'* (EU, 2002a).

These definitions sound rather meaningless, similar to the FAO definition of GAP as a definition for 'current agricultural practice', but in fact, GFP is quite important in the European CAP. Table 1 shows possible components of GFP.

Table 1:Components of GFP

Level	Legal basis	Usual i.e. common Good Farming Practice in addition to legislation
EU	EU environmental, agricultural, food legislation (Nitrate Directive, Pesticide Authorization Directive, Directives on Food Residues, Waste, Water Framework Directive etc.)	
National	Environmental, agricultural, food legislation (Plant Protection Acts, Water Protection Acts, Nature Protection Acts etc.)	Catalogue of criteria (Codes of Good Plant Protection Practice, Good Manure Management, Buffer Zones)
Regional	Additional regional legislation e.g. in Federal States, Departments	Regional guidelines
Local	Additional local legislation (Conservation Regulation, Water Protection Zones, Habitat Protection)	Local definitions (IPM in orchard and wine areas like Tirol, Altes Land, Hamburg, Burgundy, etc.)

The Good Farming Practice concept is incorporated in the 'second pillar' of CAP, the Rural Development Regulation 1257/1999, as well as in the special assistance programmes for agricultural and rural development (SAPARD) in Romania and Bulgaria. It serves as a reference level and a base-line for support in agri-environment programmes under the rural development regulation. Member States are obliged to establish *verifiable standards* for

control of compliance with GFP in agri-environment plans and for support of less favored areas (LFA). These standards have to represent at least compliance with general mandatory environmental requirements (EU, 1999a). This means that agri-environment programmes must go beyond GFP and Member States must define and standardise GFP individually before starting a programme in a certain region. It is also up to the Member States to control compliance with their GFP and they are required to check at least 5% of the farms, which receive support.

Currently, there is no single document presenting an overview of national GFP requirements and areas with different degrees of GFP in the 15+10 EU countries. However, the German Federal Agricultural Research Centre (FAL) and the Institute for European Environmental Policy (IEEP) compiled a number of examples for GFP in accession countries (see box).

Rural development policy will be strengthened by 2005 in order to promote a healthier environment, quality produce and animal welfare, and to help farmers to meet EU production standards (EC, 2003a).

Bulgarian GFP is mainly on water pollution, soil fertility and designated conservation sites. Some examples of verifiable standards include the prohibition of storing or disposing of pesticides within 20 metres of a river bank, stream, lake, water reservoir or seashore; and, the prohibition of any construction of cattle sheds or manure storage within 20 metres of a river bank, stream, lake, water reservoir or seashore.

Polish GFP covers a total of 30 requirements and obligations. Approximately five per cent of all Polish farmers currently comply with these GFP (IEEP, 2003).

Czech GFP (shortened) is

- to comply with legislation dealing with natural resources
- not to plant broad-row crops like maize, beets or potatoes on very steep slopes. Contour cultivations and transport should be undertaken.
- not to plough turn grassland into arable land in zones of higher water infiltration and slopes.
- to cut grasslands on agricultural land at least once a year and meadows, where two cuts are usual, twice a year (FAL, 2003).

2.3 Cross Compliance

Agri-environment programmes are good tools to achieve regional environmental improvements and to change practices of individual farmers, but they only reach farmers, who participate. The concept of ‘cross compliance’ has the potential to influence farming practices of all farmers who receive CAP payments.

In the future, CAP payments to farmers will be linked to the respect of environmental, food safety, animal and plant health and animal welfare standards, as well as the requirement to keep all farmland in good agricultural and environmental condition (EC, 2003b). Article 3 of Regulation 1783/2003 EC, which lays down common rules for direct support schemes, states:

'A farmer receiving direct payments shall respect the statutory management requirements referred to in Annex III, according to the timetable fixed in that Annex, and the good agricultural and environmental condition established under Article 5.

2. The competent national authority shall provide the farmer with the list of statutory management requirements and good agricultural and environmental condition to be respected.'

The 'statutory management requirements', which are defined in Annex III, refer to 18 EC Directives which are meant to protect the environment and to ensure public health and animal welfare. Council regulation 91/414 EC on the authorization of pesticides is included in this list, but the Water Framework Directive (2000/60 EC), the Drinking Water Directive (98/83EC) and none of Directives setting MRLs for pesticide residues in food are mentioned (EC, 2003c). However, the instrument of cross compliance is an enforcement tool. It ensures that farmers produce on the 'good', meaning legal, level but does not require that farmers go beyond this good level.

It is quite interesting that 'cross compliance' does not utilise the term 'Good Farming Practice' for the description of the 'statutory management requirements' and it seems there is no obvious reason to separate these terms. However, GFP minimum standards require compliance with existing regulation as cross compliance demands.

2.4 Integrated Farming (IF), Integrated Crop Management and Integrated Pest Management (ICM and IPM)

Integrated Crop Management as shown in Figure 1 is an integral part of Integrated Farming Systems (IFS), an approach that embraces the whole farm - animal and crop production. ICM, however equals IFS in cases where farms only produce crops. In this brochure IF, IFS, ICM will be used interchangeably while focusing on pesticides and on crop production.

Integrated Pest Management (IPM) can be an integral part of ICM, they are not equal by definition, because the one focuses on pests, while the other looks at all crops, but at farm level differences can disappear. Sophisticated IPM can be close to ICM and a farmer, who applies ICM is likely to be a good pest manager as well. In intensive farming systems without much crop rotation, such as wine and orchard systems, but also flower production and under-glass production IPM plays a greater role than ICM. Narrow crop rotation and limited agricultural area reduce the possiblities of ICM.

This, of course depends on the defintion and similar to GAP and GFP there is no single valid definition of ICM or IPM. Bajwa and Kogan (2004) compiled 29 different IPM definitions, which emerged in the time span 1990-1998 alone. Most of these definitions have a few points in common, they focus on pest control via pest prevention and integration of cultural, biological, chemical and/or technical measures respecting environmental sensitivity and utilising decision-making processes. However, IPM is an instrument for pest control, while ICM is a more holistic instrument, which also focuses on nutrient management and the entire agro-ecosystem.

According to the FAO (2003) Integrated Pest Management (IPM) means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep

pesticides and other interventions at levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.

A number of definitions also exists for ICM or IF. One of the most elaborated and progressive definitions has been developed by the International Organisation for Biological and Integrated Control of Noxious Animals and Plants (IOBC). For the IOBC integrated production *'is a farming system that produces high quality food and other products by using natural resources and regulating mechanisms to replace polluting inputs and to secure sustainable farming. Emphasis is placed on a holistic systems approach involving the entire farm as a basic unit, on the central role of agro-ecosystems, on balanced nutrient cycles and on the welfare of all species in animal husbandry. The preservation and improvement of soil fertility and of diversified environment are essential components. Biological, technical and chemical methods are balanced carefully taking into account the protection of the environment, profitability and social requirements.'*

Integration of natural resources and regulation mechanisms into farming activities to achieve *maximum replacement* of off-farm inputs is one of the key objectives in the concept.

In its crop-specific guideline the IOBC clearly prohibits some uses of pesticides as well as uses of some chemical classes. The guidelines for apple production for example state: *'Chemical soil sterilisation is not permitted. (…) The cultivar chosen must offer good prospects for economic success with minimal use of agrochemicals. For example Golden Delicious must not be planted on sites prone to russeting, nor Jonagold on sites unfavourable for fruit colouring and firmness. Cultivars resistant or tolerant to diseases and/or pests are preferred. Planting material should be sound and certified virus-free.'*

'*Overall bare soil management of orchards is not permitted (..) Where possible, in established cropping orchards with excessively vigorous growth the use of herbicides must not be permitted. (..), … a weed free strip should be maintained by mulching or covering the soil surface or by mechanical cultivation. Herbicides permitted in Integrated Fruit Production (…) may only be used to supplement such cultural weed control methods"* (IOBC, 2002).

Some Member States defined ICM/IF based upon the IOBC, for example Austria, Belgium and Spain. Other Member States such as Germany, France, Italy and Luxembourg base their ICM/IF definition on the definition by EISA (Agri CEAS Consulting, 2002). EISA stands for the European Initiative for Sustainable Development in Agriculture. An ambitious name, but looking behind the scene reveals that EISA is primarily an organisation of industrial farming representatives and the agro-chemical industry. The EISA Codex of Integrated Farming (EISA, 2001) is therefore rather general and regarding crop protection it does not go beyond EPPOs Good Plant Protection Practice, actually it looks very much like a copy of the German recommendations on Good Professional Practice in Plant Protection (BELF, 1998). Thus crop specific guidelines have not been developed by EISA.

A thorough analysis of ICM in the European Union was conducted for the European Commission in 2002. The analysis looked at the environmental and economic impact of 10 ICM schemes in comparison to conventional systems. Regarding pesticides, reduced leaching into water could be proved as well as reductions in use. Pesticide residues in soil were reduced and positive effects on biodiversity observed. The economic impact was

difficult to evaluate. The variable production costs were, due to reduced inputs, lower, but in some cases other costs, namely for management, increased. The evaluation of the yields showed that yields under ICM tend to be lower than in conventional systems, but further development may deliver yields comparable to conventional production. In opposition to organic farming a premium price for certified ICM products is not available and lower yields are not compensated. However, ICM can achieve similar profitability to conventional farming, but more research needs to be done.

The monetary external costs of ICM were not compared with those occuring from conventional farming, but due to better environmental performance, external costs related to ICM are probably lower.

The next table shows that ICM schemes are/were not relevant in most of the MS. An EU average of 2.7% (time-span 1995-1998) is just 0.7% more than the average organic area in 1998 (Foster and Lampkin, 2000). However, the interpretation of these numbers needs some caution. The numbers represent certified ICM farmers and exclude farmers who may apply ICM, but who are not certified.

Table 2: Estimates of agricultural land under commercial ICM in EU Member States (1995-1998) [1]

	Area of ICM (hectares)	Total utilised agricultural area (hectares)	ICM as proportion of total utilised agricultural area
Austria	608,097	3,423,000	17.8%
Belgium	7,140	1,382,000	0.5%
Denmark	637,100	2,764,000	23.0%
Finland	14,390	2,150,000	0.7%
France	133,000	30,169,000	0.4%
Germany	225,070	17,327,000	1.3%
Greece	268	3,465,000	0.0%
Ireland	19,187	4,434,000	0.4%
Italy	159,381	15,256,000	1.0%
Luxembourg	n/a	127,000	n/a
Netherlands	29,970	1,848,000	1.6%
Portugal	57,969	3,942,000	1.5%
Spain	38,507	29,377,000	0.1%
Sweden	157,138	3,109,000	5.1%
UK	1,554,203	15,858,000	9.8%
EU-15	**3,641,420**	**134,631,000**	**2.7%**

(Agra CEAS Consulting, 2002)

The table illustrates that Austria, Denmark and the UK are the countries with largest area under ICM production. In Austria the large orchard region South Tirol has a long IPM tradition and support from the Austrian agri-environment programme ÖPUL lead to a further increase of ICM.

With implementation of the rural development regulation 1257/1999EC the areas of ICM probably increased Europe-wide, but even when one considers that the average area has doubled or tripled by now, the percentage is still very small in most countries.

[1] There is a great variety of different ICM standards and these numbers should be considered indicative.

3 Organic Agriculture

While the concepts GAP, GFP, IPM and ICM are some kind of risk management in conventional agriculture, organic farming is a true alternative. Since the early years of the 20th century alternative methods of agricultural production have been developed, mainly in Northern Europe. There have been three important movements coming from three countries: Biodynamic agriculture appeared in Germany, Organic farming, which originated in England and Biological agriculture, which was developed in Switzerland. Despite some differences in emphasis, the common feature of all these movements, is to stress the essential link between farming and nature, and to promote respect for natural equilibrium. They distance themselves from the interventionist approach to farming, which maximises yields through the use of various kinds of synthetic products (EC, 2000b).

What is organic farming?

Organic farming differs from other farming systems in a number of ways. It favours renewable resources and recycling, returning to the soil the nutrients found in waste products. Where livestock is concerned, meat and poultry production is regulated with particular concern for animal welfare and by using natural foodstuffs. Organic farming respects the environment's own systems for controlling pests and disease in raising crops and livestock and avoids the use of synthetic pesticides, herbicides, chemical fertilisers, growth hormones, antibiotics or gene manipulation. Instead, organic farmers use a range of techniques that help sustain ecosystems and reduce pollution. (EU, DG Agriculture Website)

Organic agriculture[2], however is not *no-input* farming, farmers, who do not use synthetic products are not *per se* organic farmers. Organic farming is furthermore a knowledge-based management system. The Codex Alimentarius Commission (CAC) of the FAO defines: *'Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, cultural, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system'* (CAC, 2001).

Historically, organic agriculture played a minor role in Europe until the late 1980s, but environmental problems and food scandals originating in conventional agriculture lead to a policy support of organic farming, in particular in the context of agri-environmental and rural development measures.

Organic farming is supported by policy because it is recognised as delivering environmental and other benefits to society that are not, or only partly, paid for through the normal price of food. It is also supported as an infant industry, which expands the consumers choice and allows the industry to develop to a point at which it is able to be independent and compete in established markets and make a positive contribution to rural development.

The financial support differs substantially from country to country. Conversion grant aid in the year 2000 was 180 Euro (average) in Germany, 440 Euro in Finland. It is expected that

[2] In this brochure the term organic agriculture or organic farming is also used for Biodynamic and Biological agriculture.

with the further implementation of the CAP reform (Agenda 2000) more support will be given to organic farming. With the Rural Development Regulation (RDR) it is possible to support organic farming with subsidies in various ways: agri-environment programmes, investment aid, marketing aid, and regional development and demonstration farms.

In recent years, organic farming has expanded rapidly to over 3,24% of agricultural land area (4.44 million ha on 142,348 holdings) in the EU at the end of 2001 (IFOAM, 2003).

While most countries have experienced periods of rapid growth followed by consolidation, the overall growth rate in Europe has been relatively constant at 20-25% per annum, with Germany and Central and Eastern European (CEE) countries creating centres of growth. On the basis of historical growth rates, organic farming could account for 10-20% of European agriculture by 2010, depending on developments in the economic, marketing, legislative and policy environment that has provided the basis for recent growth, particularly since the mid-1990s (Lampkin, 2002).

The next figure shows the percentage of agricultural land under organic production in 29 European countries according to a survey in February 2003 (IFOAM, 2003).

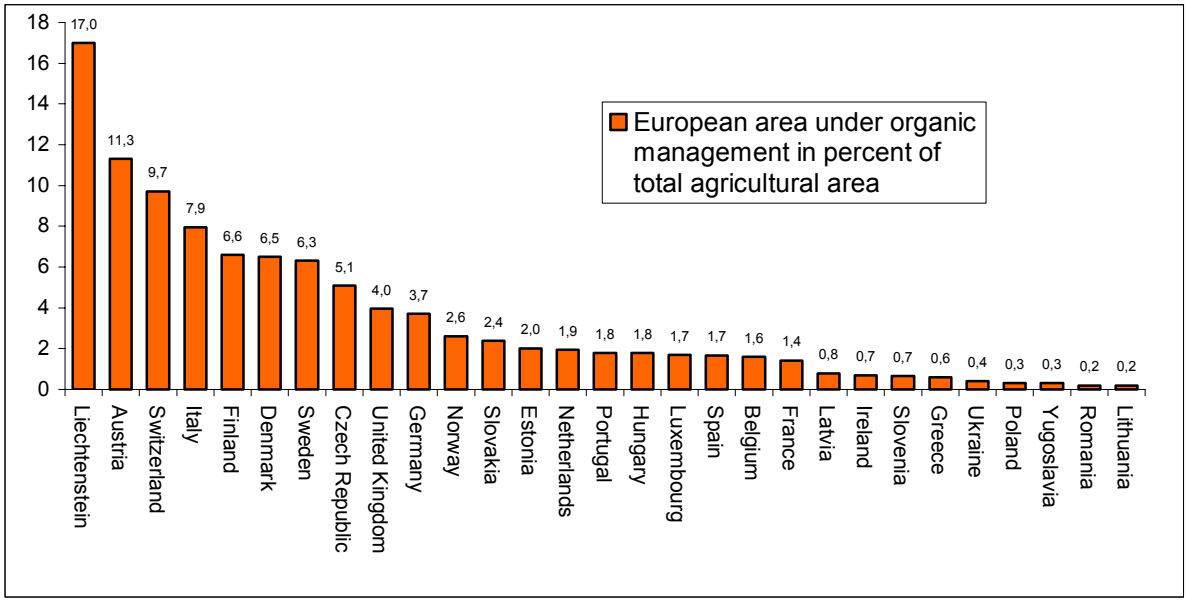


Figure 1: Area under organic production in European countries in 2003 (IFOAM, 2003)

The figure shows that there are big differences between the countries. In Liechtenstein and Austria organic farming exceeds the 10% line, while in most countries organic farming is still below the 2% line.

In order to receive a status as an organic farmer and thus premium prices, farmers have to be certified according to specific standards. Until the beginning of the 1990s private organisations developed standards for organic production, inspection and certification. Since then governments have taken over this task.

In the European Union Council regulation 2092/91EEC on organic production (EC, 1991) and 1804/99EEC regulate organic production and organically produced food.

On a global level the Codex Alimentarius Commission (CAC) defines the common international ground for governments. One of the most important non-governmental Organisations which defines standards and accredits certifiers globally is the International Federation of

Organic Agriculture Movements (IFOAM), the international umbrella organisation of organic agriculture organisations. IFOAM has about 750 members in about 100 countries.

The next table shows the comparison between IFOAM standards, CAC guidelines and EU Regulation.

Table 3: Comparison of different organic standards

Items	IFOAM Basic Standards 2002 (Part of the IFOAM Norms for Organic Production and Processing)	Codex Alimentarius Organic Guidelines 1999/2001	EU Regulation 2092/91 (and Amendments) and 1804/99 for Organically Produced Food
Scope	Food and non-food, including fish, textiles (new draft)	Mainly food	Food and non-food
Conversion	Farm or farm unit, minimum 1 year before harvest, perennials 2 years	Farm or farm unit, minimum 2 years before harvest, perennials 3 years	Farm or farm unit, minimum 2 years before harvest, perennials 3 years
Fertilisation	Comparable similar list, clear criteria list for new inputs	Comparable similar lists, exclusion of manure from factory farming	Comparable lists, only manure from extensive farming
Pest and disease control	Similar list	Similar list	Similar list
GMO products	Excluded	Excluded	Excluded
Animal husbandry	Rather detailed, developed as a framework for national organisations	Developed more as a framework for national bodies	Very detailed regulation, especially for poultry
Processing	Elaborated criteria list for new additives and processing aids, detailed list	Criteria list further developed, for animal products very restrictive list	Little developed criteria, no list for animal products yet
Labelling	Conversion label after 2nd year allowed. Mixed products with >95% organic: full labelling; 70% products: emphasis labelling; products with <70% only on the ingredients list	Conversion label after 2nd year allowed. Mixed products with >95% organic: full labelling; 70% products: labelling on the ingredients list, only allowed on a national level	Conversion label after 2nd year allowed. Mixed products with >95% organic: full labelling; 70% products: labelling on the ingredients list

(Source IFOAM, 2003)

The table shows that there are not so many differences between the 3 standards.

Use of pesticides is, with some exemptions, prohibited. In most organically grown crops pesticides are not used at all, a wide crop rotation and resistant varieties make the use of pesticides redundant. In perennial crops such as fruits and wines organic growers still depend on copper compounds to control fungus, which is, due to its high toxicity to aquatic organism and its accumulation in the soil, of environmental concern. However, since 2002 copper applications are restricted up to a total of 8kg per ha and year until 31.12.05 and then up to a total of 6 kg ha per year in the European Union.

4 Moving towards Pesticide Reduction

The previous chapters of this brochure described a number of concepts which have the capacity to reduce negative side-effects of conventional agriculture, and organic agriculture as an alternative production system. The purpose of the next chapters is to show problems associated with pesticide use, especially in CEE countries and necessary steps towards pesticide reduction.

Pesticide reduction means the reduction of adverse effects, risks and potential risk associated with the use of pesticides. It also means decreasing the level of chemical dependence. Farmers in Western Europe became more and more dependent on pesticides and they often complain that they are not able to produce certain crops without pesticides. Pesticide reduction should thus also aim to loosen the dependency chain.

Risk and dependency reduction is not necessarily achieved by a reduction of the volume (EC, 1999b). Copper compounds, for example, are used in high application rates to control fungus, but they play no role as food residues and they are considered to be non-toxic to human health. If a farmer shifts from copper to synthetic fungicides such as dithiocarbamates he will reduce the volume used, but the risks have risen. Dithiocarbamates, especially pesticides of the Maneb group are one of the pesticides most often detected in food (EC, 2001a, 2002b) and they are considered as possibly carcinogenic (U.S.EPA, 2000).

Why is pesticide reduction necessary?

'We see evidence of the hundreds, if not thousands, of man-made chemicals, including pesticides, that persist in the environment and accumulate over time and we are only just beginning to understand the implications of this for our health. Low-level exposure to a complex of pollutants in air, water, food, consumer products and buildings may be contributing significantly to asthma, allergies, some types of cancer, neuro-toxicity and immune suppression. (…) Furthermore, we have a poor understanding of the effects of small quantities of pollutants that accumulate in our bodies as well as the way different contaminants interact with each other in our bodies (often referred to as the 'cocktail' effect). Furthermore, some of our existing standards have been established with the 'average' adult in mind without taking into account the need to protect particularly vulnerable groups in society such as children and elderly people. The situation demands that we give environment-health issues renewed attention.'
(EC, 2001b)

A reduction of the treatment frequency (TF), the number of applications at prescribed dose, is targeted in Danmark, while in Sweden and the Netherlands the reduction of environmental and/or health risks are targeted. The box below shows reduction targets and achieved reductions in four countries. The results show that in these four countries pesticide reduction has been working successfully for many years (PAN Europe, 2003a).

Country	Period	Reduction Target	Reductions achieved
Danmark	1987-1997	50% use/volume ai 50% TF (to 1.34) (baseline: 1981-1985)	47 % use/volume ai 8% TF (to 2.45)
	2000-2002	TF less than 2.0	TF 2,04 (59% use/volume ai)
	2004-2009	TF = 1,7	
Sweden	1986-1990	50 % use/volume ai (baseline: 1981-1985)	49 % use/volume ai
	1991-1996	75 % use/volume ai	64 % use/volume ai
	1997-2001	No use target, but further reduction in risks expressed by environmental and human health indicators	63 % for environmental risk indicator (2000) 77 % for human health risk indicator (2000).
The Netherlands	1990/91-2000	50% use/volume ai (baseline :1984-1988)	43% use/volume ai
	2004-2010	75% reduction in risks by 2005 and 95% by 2010, as expressed by an environmental load indicator (baseline : 1998)	
Norway	1985-1996	Reduce use as far as secure	54 % reduction in use
	1998-2002	25 % risk reduction	Norwegian risk indicators showed a 33 and 37 % reduction in health and environmental risks, respectively
	2004-2008 in preparation		

4.1 Bad Pesticide Practices in CEE Countries

In CEE countries, pesticide use is considered very low compared to Western European countries, so one could argue that pesticide reduction is not an issue for CEE countries. This is not true.

Statistics of national averages fail to deliver the real picture. There are low use and high use areas. In western Poland the average pesticide use is about 6kg/ha, which is the 2,2 kg above EU-15 average (Eurostat, 2002), in southern Poland pesticide use is about 1,5 kg per ha. The differences between low and high intensity areas is not made in most countries. Usage data are in general not reliable. In addition, illegal imports and use of unauthorized pesticides are major issues especially in Bulgaria, Romania an the Ukraine, such uses are not covered by official statistics.

It is true that many farmers do not use pesticides at all, because they cannot afford them, but farmers who apply pesticides often do not handle them properly. A report conducted for the UNDP/GEF Danube Regional Project looked at the pesticide use in 11 Eastern

European Danube countries[3] and found a number 'bad pesticide practices' in this region (GFA Terra/Avalon, 2003a).

- The **uncontrolled and illegal trade in pesticide products** leading to the use of banned pesticides (e.g. DDT) by farmers is reported to be a problem in many countries – although this is a sensitive issue that is difficult to verify. There is particular concern that certain countries lacking an effective pesticide control system (e.g. Ukraine) are gaining a reputation as a "dumping market" for obsolete and illegal products.
- **Poor storage of pesticides**, including old pesticide stores, continues to be a problem in many countries. In the Ukraine there are some 20.000 tons of obsolete pesticides still in storage often under bad conditions posing a serious threat to human health and the environment (e.g. infiltration into groundwater). In Bulgaria, 35% of the pesticide storehouses are reported to be in bad condition. In Moldova some 6.000 tonnes of obsolete pesticides are reported to be in storage on former State and Collective farms, including single stores containing up to 4 tonnes.
- **Use of pesticides in excess of recommended rates** – in particular, the over-application of maize with the herbicide Atrazine (up to 2-3 times the recommended rate) is consistently reported as a serious problem. In many cases, over-application is due to lack of knowledge/training and the tendency to apply larger amounts in the belief that this will increase the effectiveness of the pesticide products.
- The **unauthorised use of pesticides on crops they are not registered for** (e.g. use of Lindane on vegetables) is reported as a common problem in most countries.
- The **cleaning of spraying equipment and disposal of unused pesticide**, pesticide containers and "spray tank washings" nearby to or even in water courses such as rivers and ponds.
- The **drift of pesticide spray to adjacent areas** due to the old spraying equipment used (most spraying equipment used in the region is now more than 15 years old), plus poor knowledge and lack of operator training (e.g. spraying in windy conditions).
- **Lack of knowledge** of and/or compliance with obligatory "buffer zones" for surface waters and other protected areas.
- The **poor timing of pesticide application** due to poor knowledge and lack of operator training leads to inefficient application and increased risk of pollution.

The examples above clearly show that pesticide use in CEE countries is associated with a number of serious problems and pesticide reduction needs to be addressed. In addition to the problems mentioned, EU accession will most likely lead to agricultural intensification, hence to an increased pesticide use.

[3] Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia & Herzegovina, Serbia & Montenegro, Bulgaria, Romania, Moldova, Ukraine

4.2 Best Agricultural Practice

The concept of Best Agricultural Practice (BAP) was originally introduced to CEEC representatives of 11 Danube countries at a UNDP/GEF workshop in Zagreb in October 2003 (GFA Terra/Avalon 2003b). The objective of developing a concept of 'best agricultural practice' in the Danube Regional Project was to support the design of new agricultural pollution control policies for the central and lower Danube countries – as well as encouraging compliance with existing and emerging national legislation – that will promote the greater integration of pollution control consideration into the day-to-day management of crops, animals and agricultural land. The BAP concept is therefore like GAP and GFP a concept to manage adverse effects and risks caused by conventional agriculture. But there are major differences. First of all, as the name indicates, Best Agricultural Practice eventually goes beyond Good Farming Practice and Good Agricultural Practice, which are often understood as 'current agricultural practice'. Secondly, while GAP and GFP are concepts focusing on rules, regulation and recommendations, BAP is a concept focusing on a *hierarchy of activities*. The BAP concept should be seen as a step-by-step approach from 'bad practices' to 'good practices' to 'best practices' in the local agronomic, environmental, social and economic context. Table 4 illustrates an example, where the BAP concept addresses the use of pesticides e.g. plant protection and where Bad, Good and Best practices are divided into 3 zones e.g. levels. The blue zone is the level of GAP and GFP. It should be one of the first priorities in CEEC that all farmers move from the red zone, representing bad agricultural practices into this blue zone. It might be not realistic that all farmers then would move to the green zone, representing the best agricultural practice. A household survey undertaken during the preparatory stages of the GEF-funded Agricultural Pollution Control Project for Romania revealed a widespread ignorance of notions such as 'pollution' or 'environment' due to the fact that the majority of the population in the project area is aged or uneducated (GFA Terra/Avalon, 2002). This might be a common situation in CEE countries and if these farmers implement GAP/GFP this would be a major achievement and possibly *their* best practice. On the other hand there are good educated commercial farmers, who would be well able to move up to the green level. When viewed like this, Best Agricultural Practice may vary significantly according to:

- the agronomic, environmental and socio-economic context in which the farmers are operating
- the availability of appropriate policy instruments for encouraging farmers to move up the hierarchy
- the availability of appropriate knowledge and other technical resources for supporting farmers to move up the hierarchy

The next chapters will focus on appropriate policy instruments for encouraging farmers to move from one level to another, as well as legal requirements on a national level.

Table 4:Illustration of Bad, Good and Best Plant Protection Practice, necessary policy interventions and examples of relevant policy tools

		Typical Management Practices (e.g. pesticide management)	Necessary Policy Intervention	Examples of Relevant Policy Tools
"Green Zone – Best Plant Protection Practice" Higher level of environmental management practice that delivers greater environmental benefit, but usually at greater "cost" to the farmer		Change to Integrated Crop Management (ICM) Preparation of a pesticide reduction plan Investment in new storage facilities and drift reduced spray equipment	Incentives to go beyond minimum level of pest management practice	Agri-environment payments Capital grants for better technology Premium prices for quality products etc. Decision-making tools
"Blue Zone – Good Plant Protection Practice" Minimum level of environmental management practice that it is "reasonable" to expect a farmer to undertake as part of "usual" farm management and without expecting any form of compensation/financial assistance. This must include respect for environmental legislation, following advice from extension services, taking into account scientific and technical progress etc.	Increasing complexity requiring more information, greater management skills, better technology etc. and often greater costs for the farmer	Following the pesticide label instruction. Cleaning of containers and spraying equipment on the treated field. Use of registered and suitable pesticides Use of the correct application rate and frequency	Appropriate interventions for promoting minimum level of environmental management practice	Advisory services linked to progressive and well-funded R&D programmes Specialist extension techniques e.g. "local management groups" Decision-making tools "Cross-compliance" with government support payments
"Red Zone – Bad Plant Protection Practice" Unacceptable management practices that are commonly prohibited by law.		Cleaning spraying equipment in and near surface water "Wild" disposal of unused pesticides and containers Purchase and use of non-registered pesticides	Disincentives for dropping below minimum level of environmental management practice	Legislation – including improved enforcement Codes of Good Plant Protection Practice Financial penalties and other sanctions

4.3 From Bad to Good

Chapter 4.1 listed a number of 'bad practices' regarding pesticide use in CEE countries. There are a number of instruments available to make farmer change their practices. Negative incentives e.g. financial penalties are one option, but may not be the correct measure for semi-subsistence farmers who live on the poverty line. Positive incentives which are accompanied by agri-environment programmes require good farming as a base line, direct payments require compliance with legislation as well. Cross compliance and RDR funds are only tools for EU farmers - and for farmers, who already receive support and must fear loosing this support if they act illegally. Cross compliance and RDR funds are only useful to move farmers away from 'bad practices' if they strive to get CAP support.

However, on a national level there are a number of policy instruments, which are needed to move from bad to good practices:

Control of the use and distribution of pesticides – national governments must strive to stop illegal trade in pesticide. The authorities on the borders should receive training on the issue of illegal pesticide trade.

Legislation must enable authorities to impose high fines on sellers of illegal pesticide.

Extension services and farmers need to have access to information about the dangers of illegal and often unlabelled pesticides, thus public outreach is recommended. Simple and easy to understand information material on the dangers of improper and illegal pesticide use should be provided to all farmers.

Retail stores, extension services and other organisations working with farmers could serve as distributors of information material.

Development and Promotion of GAP/GFP and Codes of Good Plant Protection Practice – national government must continue to develop and promote codes of GAP/GFP and Codes of Good Plant Protection Practice. Good Plant Protection Practice needs to be a verifiable standard within GFP, rural development payments to farmers should only be made if farmers can prove their good practices.

Farmers' license - farmers, who apply pesticides need to have a license. In order to obtain and hold a license farmers must attend comprehensive training on:

- the safe handling of plant protection products and spraying equipment (cleaning, safety distances)
- disposal of unused pesticide and containers
- record keeping

The licenses should have an expiration date of 3 years. If farmers can prove that they attended a total of 48 hours training on ICM, preventive measure and non-chemical alternatives during the 3 years the license will be prolonged. Purchase of pesticides without a license should not be possible.

Replacement of old spraying equipment – governmental funds should be made available to replace old spraying equipment with modern spraying equipment.

Licensing and control of spraying equipment – legislation for the licensing and control of spraying equipment needs to be developed and implemented.

Disposal system for pesticide and containers – distributors and retailers need to be legally required to take back unused pesticides and empty containers. Unused pesticides and empty containers should be recycled in an environmentally friendly manner. Industry responsibility needs to be strengthened.

4.4 From Good to Best

There are a number of instruments by which farmers can move from good agricultural practices to best agricultural practices, such as training of farmers and advisors, agri-environment programmes funded under CAP, but also privately organised quality assurance systems with high requirements. A strict definition and implementation of ICM, a highly educated advisory service and promotion of low-input and pesticide free farming should be standards for Best Agricultural Practice:
Research and Implementation of Integrated Crop Management (ICM) and Integrated Pest Management Standards – governments need to support research in order to define ICM and IPM standards for all major crops especially maize, wheat, vine, fruit and vegetables to promote minimum use of pesticides. Methods applied in organic agriculture need to be reviewed for the transfer to conventional agriculture.

Plant protection is very specific to crop and region. The following guidelines for ICM standards build a framework for environmental protection and sustainable agriculture on farm level. National authorities, farm advisers, scientists and farmers must fill this frame in order to develop standards for all major field crops, vine, fruits and vegetables. The ICM standards must be orientated towards the avoidance of the use of chemical plant protection practices.

ICM standards for crops must include:

- a detailed description (lifecycle, habitus, time of occurrence, favourable conditions) of major pests, diseases and weeds, specific for regions and their natural predators,
- Diagnosis possibilities for major pests, diseases and weeds, specific for regions and their natural predators (light traps, yellow traps, coloured glue traps etc.)
- ecomonic threshold values
- possible preventive measures, basic strategies (reduced fertilising, tillage, delayed sowing etc.),
- biological means of control (support and/ or introduction of benefical insect, use of biological pesticides)
- chemical means of control, if necessary
- application time, frequency and equipment
- measures to manage resistence

ICM standards must be available to all farmers and they must be updated regularly. Fulfillment of ICM standards could be a condition for subsidy schemes to farmers.

Farm Adviser License – similar to the farmers, farm advisers should be required to possess a license limited to 3 years. In addition to training on the safe handling of pesticide products and handling and adjusting of application equipment, advisers should attend special training on ICM/IPM and practical measures to prevent and reduce pesticide use to obtain the license. Farm advisers must be required to up-date their knowledge regularly, in order to prolong the license.

For EU Member States a setting up of a farm advisory service is compulsory for Member States from 2007 (EC, 2003d).

Promotion of low-input and pesticide-free farming - Funds should be made available

- to farmers to convert to organic farming,
- to farmers, who convert arable land to permanent grassland especially in the environmentally sensitive areas.

4.5 From Conventional to Organic

Conversion from conventional farming to organic production will lead to the highest reduction in risks associated with pesticide use. Most organic crops are grown without any pesticide applications and pesticides allowed in organic agriculture belong to the least toxic substances used in agriculture. Copper compounds are one exception, they are toxic to aquatic organisms and reduce soil biodiversity, therefore the application rate is currently limited to 8kg per ha and year.

Figure 2 shows that in some CEE countries, most notably the Czech Republic, Slovakia, Estonia and Hungary the area under organic production reached a similar or larger percentage that many Western European countries. Countries like Poland and Ukraine have a small percentage of the agricultural land under production, but regarding the total area they are in the Top 20 in Europe. In Bulgaria and Croatia organic farming plays no role so far (IFOAM, 2003).

The current non-use, thus low independence, of many farmers from agrochemicals in CEE countries presents a great chance for the conversion to organic agriculture. Cheaper labor costs are also an advantage in the competition with Western organic production.

The benefits of organic farming on rural development

Organic farming and integrated farming also represent real opportunities on several levels, contributing to vibrant rural economies through sustainable development. Indeed, new employment opportunities in farming, processing and related services are already evident in the growth of the organic sector. As well as the environmental advantages, these farming systems can bring significant benefits both to the economy and the social cohesion of rural areas. The availability of financial support and other incentives for farmers to convert to organic production is designed to help the sector grow still further and to support associated businesses throughout the food chain. (EU, DG Agriculture Website)

Almost all accession countries fully implemented regulations on organic production and certification bodies and labels are established. In the EU accession countries further growth of the organic sector can be expected in the next years due to financial support especially from RDR funds.

From 2004 to 2006 5,76 billion Euro are available for rural development in the new Member States (see Figure 2). This money should be used to strengthen the organic sector.

RDR funds can be used for investments in processing/marketing and marketing of quality agricultural products (EC 2003e).

Both sectors are reported to be the weakest in CEE but also in Western European countries.

In order to satisfy consumers, a wide range of good quality and processed food must be available. Food processing facilities have to comply with hygienic standards to ensure consumer safety and satisfaction. Most organic farmers in CEE countries sell fresh produce to local markets. Export plays, except in Hungary, a minor role. In order to get access to foreign markets, marketing research, product design and new processing equipment is needed. Information campaigns are needed to stabilise and expand the domestic market.

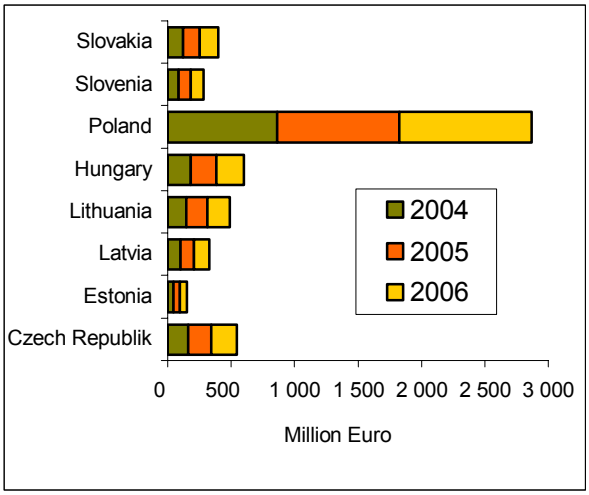


Figure 2: Budget for Rural Development in new Member States 2004-2006 (EC, 2004)

On the production side more information and training is needed, many agricultural universities do not offer courses in organic farming and state advisory services often have no capacity to advice farmers, who want to convert to organic agriculture.

5 Requirements on European Union Level

The last chapters looked at necessary changes in the national policies and requirements national governments need to fulfil, but in fact the policy in Brussels plays a major role. NGOs need to ask the European Parliament, the Council and the European Commission for change.

There is a directive for the authorisation of pesticides and there are directives regulating pesticide residues, but there is none regulating the use of pesticides so far. In order to fill this gap, PAN Europe suggested in 2002 a text for such a directive.

With this text PAN Europe (PAN Europe, 2003b) asks for European legislation to reduce the frequency of pesticide applications (treatment frequency) by 25% in 5 years and by 50% in 10 years. In detail, PAN Europe requires the following key elements to be included in European legislation:

- Mandatory reduction plans for all Member States with targets and timetables for use reduction and increased percentage of land in organic farming, including, for each Member State, a target for use reduction measured according to the treatment frequency index and a target for increased land in organic farming, within 10 years from a baseline year.
- Mandatory Community-wide targets and timetables for achieving reductions of use of pesticides, initially to be measured by frequency of application.
- National action plans setting forth how each Member State will achieve the progressive reductions of uses of pesticides according to the targets and timetables in the Directive and, in particular, for all areas under control of public authorities and for agricultural uses.

- National studies to determine the feasibility and consequences of various scenarios for the progressive reduction or phasing out the use of chemicals for pest control, and to serve as a basis for Member States to determine how they will achieve the mandatory targets.
- EU-wide and national measures to reduce dependency on chemicals for pest control, including mandatory application of integrated pest management (IPM) for non-agricultural pest control situations and of integrated crop management (ICM) on all cultivated land not yet in organic farming. The measures should include expanded financial support for research and extension on pest control practices that minimise and, where possible, eliminate the use of pesticides and for conversion to organic farming and low input agriculture.
- Integrated Pest Management (IPM) and Integrated Crop Management (ICM) (whose standards have to be accurately defined by each Member State) as a minimum for all EU non-agricultural and agricultural pesticide uses. Cross-compliance with ICM should be a condition for Common Agricultural Policy (CAP) subsidies. ICM systems are highly likely to reduce incidence of pesticide leaching and impacts of pesticides in soils and to have a positive impact on the biodiversity of non-cropped species including macrofauna. If ICM results in slightly reduced yields, the reduced costs can however lead to higher profitability.
- CAP should ensure that small and medium sized farmers reducing their use of pesticides do not face a reduction in income. CAP should also provide more support for agri-environmental measures, especially for organic farming.
- Full access to information on pesticides held by authorities, including information supporting specific regulatory decisions in due time to allow for response from the general public.
- The revision of Directive 91/414/EC must ensure that pesticide active ingredients, including persistent, bioacccumulative, CMRs (carcinogenic or mutagenic or toxic for reproduction) or EDs (endocrine disruptors) are excluded from marketing and use.
- Pesticides classified as priority hazardous substances under the Water Framework Directive 2000/60/EC should be excluded from Annex I of Directive 91/414EC.
- Mandatory training and certification of dealers and professional users of pesticides including farmers, according to minimum Community standards.
- Mandatory technical requirements for and regular inspection of pesticide application
- Equipment and storage facilities.
- Coordinated monitoring and data collection of the impacts of pesticide use on human health and the environment, including long-term research programmes.
- Coordinated systems for collecting information on production, import, export, sales, distribution and use of pesticides, including mandatory record keeping and reporting of all applications of pesticides including amounts used per crop.
- Bans on applications of pesticides by aeroplanes and in pesticide vulnerable zones
- Access to information and public participation in regulatory decision making on pesticides on a European and national level.

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