Semaine pour les alternatives aux pesticides

Alternatives to Pesticides Week

INTEGRATED PRODUCTION

Making change possible

Pesticide Action Network Europe
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Dear reader,

In this booklet you will see the posters which Pesticide Action Network Europe exhibited, in partnership with MDRGF, at the European Economic and Social Committee in Brussels from the 25-31 March to celebrate the Week for Alternatives to Pesticides.

PAN Europe has traditionally focused on getting harmful pesticides banned. This is still essential as many governments' pesticide evaluation lags behind product development by many years and Europe's pesticide approval process has yet to tackle new concerns like endocrine disruption and increased sensitivity by children and foetuses. We have also seen that the latest generation of pesticides being sold by chemical companies is not appreciably safer for the environment or our health. So replacing old pesticides with new won't do much to reduce risks. PAN Europe is therefore stressing that better agricultural practices and management are the best way of ensuring sustainability and high food quality.

Organic agricultural production is the best available practice, but we recognise that integrated production (IP) is often the most realistic short-term option for mainstream farmers. Prolonged lobbying by PAN-Europe and others has put IP on the political agenda as the alternative to high-input agriculture and IP has been adopted as mandatory for all European farmers from 2014. But this major policy success will only benefit the environment and human health if it is successfully implemented. Many players are busy 'greenwashing' pesticide-intensive practices by passing them off as IP. But IP is a holistic approach, a step towards fully sustainable agriculture, beginning with prevention, embracing biological control, and only allowing chemicals as a last resort if non-chemical methods fail.

Our main focus over the next four years is on making IP a success in Europe. PAN Europe and our members in EU countries are forming a major coalition of pro-change groups like IOBC, an international body promoting IP, and IBMA, which promotes biological control, and proactive EU countries including Denmark. We are also identifying tools for change like rewarding the best-performing IP-farmers with Common Agricultural Policy money, realising an independent extension service, and minimum IP regulation.

PAN Europe sees the new policy as an opportunity to change current agricultural practices with their harmful environmental, climatic and health consequences, into a multi-functional IP process providing top-quality food without chemical risks, and preserving biodiversity, the climate and the environment.

I hope you will find the posters of interest.

Kind regards,
Hans Muilerman

President for the Brussels office
Pesticide Action Network Europe

European Economic and Social Committee

Named after our two spotted ladybirds, **Adalia** is a Belgian non-profit association created in 2001 after a successful campaign named 'ladybirds instead of pesticides'. This year we are coordinating, for the third time, the 'Alternatives to pesticides week' campaign, which is supported by the Wallonian Ministry of Environment. www.adalia.be
Our goal is to encourage gardeners, professionals and officials to reduce their consumption of pesticides, particularly those which pollute our natural resources and threaten human health. To do this we tell them about the dangers of using chemical pesticides and advise them on using efficient alternatives.

L'ASBL **Adalia**, du nom latin de la coccinelle à deux points, est une association créée en 2001 suite au succès qu'a rencontré la campagne «Des coccinelles plutôt que des pesticides» menée par le Groupement d'Arboriculteurs pratiquant en Wallonie les techniques de la production intégrée (G.A.W.I. asbl).
Notre objectif est d'encourager les jardiniers, les professionnels et les fonctionnaires à réduire leur consommation de pesticides, en particulier ceux qui polluent nos ressources naturelles et menacent la santé humaine. Pour ce faire, nous leur parlons des dangers de l'utilisation des pesticides chimiques et leur conseillons sur l'utilisation de solutions de remplacement efficaces.

CARI is the bee research and information centre. Based in the Belgian region of Wallonia, it attempts to better respond to the problems faced by bee-keepers in providing a range of appropriate services: information, the periodical 'Abeilles & Cie', training, laboratory analysis of honey, a bee-keeping library, and applied research.

Le **CARI** est le centre apicole de recherche et d'information. Situé en Wallonie, il tente de répondre au mieux aux problèmes auxquels sont confrontés les apiculteurs en leur offrant une série de services adaptés: information, revue Abeilles & Cie, formations, laboratoire d'analyse de miels, bibliothèque apicole, recherche appliquée.

The **Mouvement pour les Droits et le Respect des Générations Futures** (Movement for the Rights and Respect of Future Generations), **MDRGF,** is a non-profit association created in 1996 by François Veillerette, author of «Pesticides : révélations sur un scandale français», and Georges Toutain, engineer in agronomy. Informing on matters linked with chemical pollutions, in particular pesticides, the MDRGF denounces the negative consequences of industrial agriculture and promotes true alternatives solutions such as biological agriculture or integrated production.

Le **Mouvement pour les Droits et le Respect des Générations Futures** - **MDRGF** est une association sans but lucratif créée en 1996 par François Veillerette, auteur de « Pesticides révélations sur un scandale Français » et Georges Toutain, intégénieur agronome. En informant sur les questions liées aux pollutions chimiques, en particulier les pesticides, le MDRGF dénonce les conséquences négatives de l'agriculture industrielle et fait la promotion de véritables solutions alternatives telles que l'agriculture biologique ou la production intégrée.

Pesticides Action Network Europe (PAN Europe) is a network of NGO campaign organisations working to minimise negative effects and replace the use of harmful chemicals with ecologically sound alternatives. Our network brings together consumer, public health, and environmental organisations, trades unions, women's groups and farmer associations from across 19 European countries. We work to reduce where possible eliminate dependency on chemical pesticides and to support safe sustainable pest control methods

Pesticides Action Network Europe est un réseau d'ONG qui travaillent ensemble pour minimiser l'impact négatif de l'usage des pesticides chimiques et promouvoir les alternatives viables. Notre réseau comporte des associations de consommateur, de santé publique, des organisations environnementalistes, des syndicats, des groupes de femmes et des associations d'agriculteurs venus de 19 pays européens. Notre rôle est de réduire, quand cela est possible, la dépendance aux pesticides chimiques et d'encourager les alternatives viables aux pesticides.

ALTERNATIVES TO PESTICIDES WEEK

Launched in 2006,

Alternatives to Pesticides Week this year celebrates its fourth anniversary. This event, initiated by ACAP (Citizens' Action for Alternatives to Pesticides), a network of French NGOs, and coordinated by MDRGF (Movement for the Rights and Respect for Future Generations), reminds us that it is both urgent and feasible to dispense with pesticides on farms, in the garden or at home.

Thus, in Europe and elsewhere, hundreds of associations, communities, businesses and other groups are putting on lectures, debates, exhibitions, film screenings, performances and tours of gardens and farms, to raise awareness of the dangers posed by pesticides and to present alternative options.

All these activities demonstrate that the issues and environmental and health risks associated with pesticide use are unacceptable and that alternatives to chemical treatments exist and are viable.

INTEGRATED PRODUCTION

Working with nature

Outdoor farming interferes with many values such as environmental and ecological quality, landscape, biodiversity, and greenhouse gas emissions. Modern farming has to juggle all these potentially conflicting interests, while cost-effectively producing high-quality food, feedstuffs and resources. Integrated production is the agro-ecological answer to these challenges.

Integrated production is based on agro-ecological principles, optimising natural resource use, smart integration of various techniques, and reducing external input, while producing high-quality output with as little environmental and ecological impact as possible.

An integral approach. Integrated production requires an integral approach to total farming systems which favour various elements: crop rotation, fertilising, crop protection, soil tillage and ecological infrastructure management. To meet the objectives in one aspect of farming (eg optimal quality, minimum loss) the other aspects should be optimally managed. Many of these technologies and practices have multiple functions. So adopting them requires simultaneous changes in several areas of the farming system.

The key elements in integrated production:

> Crop rotation: Proper crop rotation is the basis for optimal soil fertility management and crop protection. Under economic stress, most crop rotation on European farms is sub-optimal

> Integrated nutrient management: An integral approach optimising nutrient cycles in the farming system, balancing input and output of phosphorus and potassium, maintaining good all-round soil fertility (biological, physical and chemical), cutting erosion and run-off, and minimising external nitrogen input. Nutrient loss is counteracted by appropriate crop rotation, cover crop use, and appropriate soil tillage systems

> Integrated crop protection (ICP): is based on prevention, and good use of all other farming methods to minimise occurrence and potential damage by pests, diseases and weeds. ICP combines biological, physical and chemical methods in sustainable strategies with minimal environmental and ecological impact

> Soil tillage: Soil tillage systems must support optimal crop production, maintain soil fertility and contribute to preventing pests, disease and weeds. Soil tillage is important in relation to water conservation, erosion and nutrient run-off. These are potentially conflicting objectives. In an integrated system, soil tillage should address these issues

> Ecological infrastucture management: Good ecological infrastructure on farms is the basis for developing andmaintaining high biodiversity. The infrastructure should enable the flow of flora and fauna. The effectiveness in terms of control of pests and disease by natural enemies is dependent on the size and shape of the fields in relation to the green 'veins' running through the fields and countryside. Management requires designing, establishing and naturally maintaining the ecological infrastructure

INTEGRATED CROP PROTECTION (ICP)

Integrated crop protection (ICP)

All aspects of farming may affect the occurrence of pests, disease and weeds. Crop rotation, fertilisation, soil tillage, managing natural elements and ecological infrastructures and crop management, can all influence the occurrence of and potential damage of pests, disease and weeds. If we improve our methods in these areas using agro-ecological principles, we can decrease our use of crop protection in the form of active intervention.

Integrated crop protection combines biological, physical and chemical control methods into sustainable crop protection strategies which reduce the impact on the environment

Prevention is the key to ICP. This includes using sound agro-ecological methods for crop rotation, fertilisation, soil tillage and managing agro-ecological infrastructures for conservation bio-control. Prevention applied to crop management means focusing on cultivar choice, the sowing or planting date, crop density, and fertilisation.

Whenever possible, control of pests, disease and weeds must be based on the assessment of occurrence and potential damage which are available in decision support systems (DSS) or warning systems. Control itself should favour using mechanical, physical, biological and chemical methods in a feasible and cost-effective approach. Two issues are key where chemicals are used. First, chemicals should be carefully selected on the basis of their agronomic and environmental/ecological properties. Second, use should itself be kept to a minimum and optimised by using low-dose techniques, seed or plant treatments, row applications, optimal spraying technique and good knowledge on weather efficacy interaction.

Throughout Europe, ICP has proved to innovate crop protection approaches and produce good results in terms of control and a substantial decline in the use and impact of agrochemicals.

Footnote: IPM is integrated pest management, a concept known worldwide known, which integrates biological and chemical methods. ICP takes it a step further by making crop protection an integral approach in the overall farming system.


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BIO DIVERSITY

Biodiversity is vital: Reducing pesticide dependency

Pesticides have a major effect on biological diversity. They can have short-term toxic effects on exposed organisms, and long-term effects can result from changes to habitats and the food chain.

What is biodiversity?

Biodiversity is our life. Biological diversity spans the immense range of ecosystems, species and individuals.

Why is biodiversity important?

Charles Darwin and Alfred Wallace recognised the importance of biodiversity for ecosystems, suggesting that a diverse mix of crop plants is more productive than monoculture. Recent studies confirm that an intact, diverse community generally performs better than one which has lost species.

How pesticides influence biodiversity

Pesticides harm all creatures. Insecticides, rodenticides and fungicides and the more toxic herbicides all threaten wildlife. Some pesticides directly poison species, causing major population decline. Other pesticides accumulate in the food chain. Non-targeted predatory mammals (eg dogs and foxes) and raptors often suffer 'secondary poisoning' by eating poisoned mice. Pesticides can also decimate weeds and insects which are important food sources. Despite decades of European policy banning harmful pesticides, their damaging effects on wild plants and animals persist. To restore biodiversity and create opportunities to grow crops using biodiversity-based ecosystem services (eg biological pest control), there must be a Europe-wide shift to minimal-pesticide farming.


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We need a biodiversity rescue plan

The UN Convention on Biological Diversity requires EU countries to set targets for biodiversity conservation. The 2010 objectives to halt further biodiversity loss need a new rescue plan for 2020, with clear targets, deadlines and stringent monitoring.

Among other things, this means strictly enforcing new regulations on the authorisation of plant protection products, tough national implementation of the new directive on the sustainable use of pesticides, and the post-2013 reform of the Common Agricultural Policy.

The key target here must be for farmers to apply sustainable agricultural practices (integrated production). Farmers must also be obliged to sign a contract which stipulates the preventive measures they will take to discourage pests and, more generally, how they will protect human health, the environment, and biodiversity, and what special measures they will take to combat climate change.

CLIMATE CHANGE AND AGRICULTURE

Agriculture is a major contributor to climate change. According to the International Panel on Climate Change it accounts for up to 12% of all man-made greenhouse gas emissions

How does agriculture contribute to climate change?

Synthetic nitrogen fertiliser is the biggest contributor to climate change in agriculture owing to the potent greenhouse gas N2O (nitrous oxide). Methane from cows and sheep is the second largest source. An even greater agriculture-related source is land conversion.

Can agriculture help reduce climate change?

Yes. We must halt land conversion and forest destruction. Our consumption must be cut to relieve pressure on newly-converted land. Meat consumption must be slashed and first generation biofuel production shelved.

Mitigating climate change in agriculture

Reducing our reliance on synthetic fertilisers in European farming and replacing them with animal manure, compost, green cover crops and more legumes in crop rotation would also help reduce our reliance on pesticides. Increasing the soil's organic matter from natural sources increases the number of beneficial micro-organisms, which helps crops cope better with disease-causing organisms. Excessive use of synthetic fertilisers often produces lush crop foliage which attracts more pests and diseases, leading farmers to apply more insecticides and fungicides.

Agriculture: A source of car fuel?

Growing fuel crops on fertile land does not help mitigate climate change. Climate gases released during production and the indirect change of land-use outweigh any benefits. This is true of most of the current 'first generation' fuels from food crops

Agriculture and animal products

A non-vegetarian diet requires 2.9 times more water, 2.5 times more primary energy, 13 times more fertiliser, and 1.4 times more pesticides than a vegetarian diet.

What must we do?

- **Crop management**
  Agriculture should be transformed to integrated production (and ultimately organic farming), abandoning high-input agriculture, rejecting our current dependency on synthetic agrochemicals. The transition can deliver climate-neutral agriculture, producing high-quality food and feed.
- **Climate change adaptation**
  Adapting to climate change requires a robust agricultural system which can deal with changes in climate and pests. Integrated production is a hardy system which deploys preventive measures and is the best way to prepare for adaptation to climate change.
- **Animal products**
  If everybody had one meat and milk-free day each week, we would save 100m hectares of land and some 1 gigatonnes of CO2-equivalent and the related climate change gases. Wealthier countries should lead the way given their huge meat consumption, but other countries including Brazil and China should strive for lower meat consumption. The substitution of soy beans from Latin America with leguminous crops (eg beans, peas) in Europe also contributes greatly to reducing climate change and forest destruction. The CH4 production of ruminants can also be reduced by modifying feed.

FOOD CONTAMINATION

Food contamination caused by pesticides

In September 2008, the maximum legal level of pesticides allowed in food sold in the EU dramatically increased in several countries, as national food standards across the EU were harmonised to respect Regulation (EC) 396/2005 on maximum residue levels (MRLs) in food.

In 2005, the European Parliament and Council passed this Regulation which stipulated that new MRLs "should be set at the lowest achievable level consistent with good agricultural practice". However, as it considered each pesticide, the Commission chose to apply the limit in force in the country with the worst safety limit as the new EU standard.

Greenpeace and Global 2000 jointly published a study in August 2008 which showed that several hundred residue limits under the new law are unsafe, according to the EU's own standards. In particular, children's health might now be at risk from eating apples, pears, grapes, tomatoes and peppers.

What is more, this raised level is also not assessed on combination effects of pesticide residues so could in many cases be very risky. The hard-to-understand Regulation 396/2005, following pressure from the European Parliament, does state that the new MRLs should take account of cumulative and synergistic effects, when assessment methods are available. Although such knowhow exists, it was not used to help set the new MRLs.

Analysing 'cumulative and synergistic' effects is not confined to how poisonous a pesticide is. The process also takes account of the number of pesticides people to which people are simultaneously exposed. But risk assessments and decisions under the current system are not based on any such comprehensive scientific point of view.

This is a problem, especially for children, who are particularly vulnerable during the first stage of their lives, and especially in the womb. Endocrine-disrupting chemicals are a worry because they can cause harm even in small doses. Chemicals which hamper a child's development are also a major concern. Their side effects in later life may include problems with memory, learning, and motility, and attention deficit hyperactivity disorder.

CHILDREN AND PESTICIDES

Why are children more vulnerable to pesticides than adults?

We should not see children as smaller versions of adults. Their bodies are still developing and they cannot get rid of toxic substances as efficiently as adults.

Children absorb more pesticides from the fruit and cereals they eat.

They often play on land where pesticides or herbicides have been used and are more likely to put their hands in their mouth.

Children breathe more than adults so they absorb more pesticides.

How do pesticides harm children's health?

- Increasing the risk of asthma
- Contributing to rising childhood cancer rates
- Contributing to learning disabilities which affect one in six children
- Potentially contributing to birth defects of baby boys' sexual organs

A recent survey on pesticide use in British schools from the Health and Environment Alliance's (HEAL) 'Sick of Pesticides' campaign found that children may be exposed to pesticides, including possible cancer-causing chemicals, which carry major negative health impacts. The results show it is high time to make schools and other areas where children spend time 'pesticide-free' areas.

The Health and Environment Alliance (HEAL) raises awareness of how environmental protection improves people's health, and works to promote health through strengthening European policies. HEAL is a diverse network of over 60 citizens', patients', health professionals', women's and environmental groups. www.env-health.org and www.pesticidescancer.eu

IP AND THE CAP

Integrated production: The backbone of the new Common Agricultural Policy

SUSTAINABLE PRACTICES			
Crop	Banned practice	Mandatory practice	Voluntary practice covering among others
Cucumber	Use of synthetic insecticides	Use of mildew-resistant varieties	Use of biological control against fungi pests
Apple	Use of upward-spraying equipment	Use of pheromones against fruitmoth	
Potatoes	Use of late blight -vulnerable varieties	Potato growing rotation minimum1 in 3 years in same field Use of decision-supporting systems for late blight	
Strawberries	Phytopthora/verticillium/ mildew-vulnerable varieties	Use of decision-supporting systems for Botrytis	Use of biological control against spider mite

Today's agricultural practices contribute to several persistent environmental problems such as climate change, water contamination and biodiversity scarcity and loss. It is time for the European farming model to provide solutions instead of problems.

The post-2013 Common Agricultural Policy (CAP) reform needs to see transition towards sustainable agricultural practices so as to keep our soil, water, plants, animals, and ourselves, healthy.

The best way to do this is by encouraging more natural agro-ecosystems. Integrated production systems, starting with integrated pest management (IPM) should become the priority for conventional farmers, to encourage a 'prevention first' approach of which defines prohibited, mandatory and voluntary practices for each crop. These preventive measures go hand-in-hand with soil conservation measures and the reduction of chemical fertiliser use of. These ensure that the system becomes less vulnerable to pests, diseases, and extreme weather.

Given that EU farmers are not paid to comply with EU law, they should not be compensated for avoiding banned practices as from 2014. From that date, and if possible earlier, all farmers should be required to draft a strategic management plan (and IP contract) if they wish to receive CAP funding, containing clear preventive plans for which agricultural practices they aim to follow to increase resilience and prevent pest infestation.
To launch sustainable agriculture in the EU as a mainstream activity, the post-2013 CAP must be based on crop-specific EU guidelines, identifying basic agronomic techniques which land managers must apply to receive a flat-rate payment ('1st pillar support' in CAP terms), including elements to prevent pests from appearing, a crop rotation system, cultivar choice, sustainable soil management to maintain and improve soil fertility, and the re-establishment of ecological compensation areas.

Trailblazers, if they wish, should be encouraged morally, technically and financially to be even more ambitious. This kind of initiative includes further preventive measures, using non-chemical alternatives in pest management, and using pesticides only as a last resort, though the rural development programme.

The CAP will retain its current form, but the underlying philosophy will evolve away from a system which focused on giving farmers income support, into one where farmers are paid to provide public goods. A CAP which encourages sustainable agricultural practice which are better at protecting soil, water, biodiversity and our health is the best solution for society and our farmers. The latter will have clearer objectives greater stability, and a more resilient production system.

CAP AND NCAs

How the common agricultural policy can support integrated production

Agri-environmental measures form part of the Common Agricultural Policy's (CAP) rural development programme and are designed to encourage farmers to protect and enhance their farms' environment. It pays farmers in return for a service : delivering agri-environmental commitments which involve more than just good farming practice.

Generally, the agri-environmental scheme follows at least one of two objectives : reducing the environmental risks associated with modern farming, and preserving nature and cultivated landscapes.

To help reduce environmental risks, several member states stipulate the reduction of fertiliser and pesticide use as part of the 'integrated farming' approach, which must be combined with crop rotation. It is open to question to what extent this is seriously applied at present.

To restore Europe's biodiversity and create opportunities for crop production using biodiversity-based ecosystem services like biological pest control, there must be a pan-European shift to farming with minimal pesticides use over large areas.

The EU has recently taken action by means of Directive 2009/128/EC on the sustainable use of pesticides which obliges EU farmers to apply integrated pest management as from 2014. The first step must be for member states to begin adjusting their rural development programmes to offer the necessary technical support in the form of advisory systems, training, and access to biological conrol agents. Some EU countrieshave already begun. For example, the Flemish Agency for Agriculture and Fisheries, has recently launched a new agri-environment measure: 'confusion technique in apple and pear growing'(pheromone technology) against the codling moth in the pipfruit sector.

To be eligible for these grants, fruit farmers must use the confusion technique for five years over an area of at least 1hectare. The growers receive an annual payment of 250 per hectare received if they apply this technique.

The next step must be to oblige member states to develop incentives to farmers to help them practice integrated pest management as from 2014.

MAIZE AND MONOCULTURE

Monoculture means growing the same crop in the same field year after year. It is widely used in industrial agriculture, because it allows large harvests and needs minimal labour. But it has its drawbacks. Since all plants in a monoculture are genetically similar, diseases spread faster. So monoculture requires more pesticide-intensive cultivation. And over time, beneficial organisms disappear. Monoculture intensifies biodiversity loss. But solutions are waiting to be put into practice.

Water erosion

Maize leaves the soil without cover for long periods. Water run-off and soil can erosion occur.

Leaching nutrition

Maize needs a lot of nutrition. High fertiliser use increases the risk of nutrients being leached into water sources.

Change of humus content

Repeatedly cultivating maize produces heavy humus loss. But humus is key to sustainable agriculture and livelihood for millions of soil organisms.

Solution:

- **Integrating maize into crop rotation with other crops to prevent soil erosion and leaching, to conserve healthy soil structure**
- **Grow catch crops to prevent leaching**
- **Integrate legumes (which fix nitrogen) in crop rotation to reduce fertiliser input. Helps environment and climate**

Increased pest pressure and sensivity to disease

Diseases and pest pressure spread faster in monoculture than in other agricultural systems. Crop-specific pests and diseases have time to adopt and grow strong and can easily spread year–on-year. One such hard-to-control pests is the western corn rootworm. There is one generation a year. It overwinters at egg stage in the soil and the larvae feed on corn roots in early summer, severely damaging the crop. This invasive pest is a major concern in Europe.

Pesticides against pests

Intensive maize growing ignores any preventive measures. Seeds are treated with pesticides and pests are fought with pesticides.

Damage to bees and other wildlife

Pesticide-treated maize seed causes massive bee death throughout Europe. In 2008 some11,500 bee colonies were poisoned and the bees died after maize was treated with the bee-toxic pesticide Clothianidin was sown.

Solution:

- **Stop using bee-toxic pesticides**
- **Crop rotation to prevent western corn rootworm and other pests and diseases**
  Crop rotation: the key to healthy soil, pure water, lively bees and good harvests

A good example

For integrated pest management to succeed, we must reduce pesticide dependency, conserve soil , protect plant health and conservation and enrich biological diversity. IPM must set clear minimum requirements:

- **Limit percentage of surface area per crop**
- **Minimum of four crops grown in rotation**
- **Minimum agricultural surface (≥ 7%) must be devoted to areas of ecological compensation**
- **Achieve balanced manure. Nitrogen and phosphorus input must not exceed 10% of needs**
- **Don't apply bee-toxic pesticides**
- **Ban cultivation of GM crops**

MAKING EUROPE'S POTATOES MORE SUSTAINABLE

How integrated production can help

Integrated production is a holistic concept which offers a means of making farming sustainable. This would deliver improvements in the quality of the soil, water, air, climate, human health and biodiverdsity.

The idea is to take a step-by-step approach to convert farmers to more natural practices , gradually encouraging less use of synthetic inputs (pesticides and fertilisers), developing their skills and agronomic capacity, the whole process supported by an independent advisory service. The latter is especially important in the more advanced reaches of integrated production (IP).

Intensive potato production in Belgium, France and the Netherlands in large fields is currently experiencing difficulty. Over-narrow crop rotations encourage soil pests, vulnerable potato varieties are prey to late blight, and overuse of fertilisers and pesticides can create problems for people and biodiversity.

Using a range of IP practices reduces the problems with potato growing, while delivering benefits like cleaner water and air and a lower risk from chemicals. Although the ultimate goal of IP is a holistic system, the concept is designed to be applied step-by-step. Even the initial steps may vary. The 'preventive' ones merit the greatest attention because they really change crop-growing and should always form part of IP practice.

Here's one example of how an IP strategy for potatoes might be applied:

1. **Create wide crop rotation and aim to grow potatoes only once every four years**
2. **Use only late blight-resistant potato varieties**
3. **To further prevent late blight use plant-strengtheners like basalt or sulphur**
4. **Another way to discourage late blight is to plant crops further apart**
5. **To treat late blight use a decision-supporting system to minimise treatment**
6. **Only treat Rhizoctonia on the basis of analysis (damage threshold)**
7. **Apply fertilisers prudently in the season and only along potato rows**
8. **Be tolerant of weeds and only use only mechanical weeding**
9. **Dedicate 5% of fields to biodiversity by not planting crops or applying chemicals**
10. **Only use chemicals as a last resort and only those which do not harm beneficial organisms**

ARABLE CROPS

Arable crops: The first rung on the IP ladder

Targets in the pest lifecycle	Technical solutions available – rotation scale
Limit the presence of pests in crops	Diversify species in rotation to disrupt parasites: taking account of recurrence time and possible precedents
Limit the presence of disease in crops	Diversify species in rotation to disrupt parasites: taking account of recurrence the time of return and possible precedents
Limit weed specialisation and reduce seed bank	Diversify species in rotation for weed despecialisation
Reduce pest stock in plot	Establish 1 year in 3 fallow period to allow for tillage
Introduce nitrogen	Introduce at least one legume into rotation
Maintaining soil organic matter rate	Plant grain crop at least 1 year in 3 cultures grain and plough in straw
Trapping soil nitrogen in winter	Follow legumes with nitrogen-hungry winter crops, or intermediate crop
Maintain soil chemical fertility	Alternate phosphorus and potassium-hungry crops with less demanding crops

Arable farmers who wish to practise integrated crop management should not be allowed to use genetically-modified crops as they do not provide a sustainable solution to pests, disease or weeds. Herbicide-resistant crops, in particular, are likely to increase herbicide use in the long run.

Arable farmers should be obliged to deploy various tools which can be used in the context of rotation, in the knowledge that other tools operate on a wider annual strategic level.Arable farmers who apply four of the measures will help strengthen natural pest control in their fields, reduce their reliance on chemical measures and should thus be entitled to receive a flat-rate Common Agricultural Policy payment as from 2014 (currently called '1st pillar' support).

Building a crop system begins on this scale, but must of course be supported by offering supplementary tools under the aegis of the rural development programme (current called '2nd pillar' support) allowing farmers to adopt a wider range of IPM techniques, so they can benefit from a holistic IP approach.

INTEGRATED APPLE PRODUCTION

Integrated production guidelines of the International Organisation of Biological Control (IOBC)

Step 1 – Prevention

> Use disease-resistant cultivars. Plant material must be virus-free

> Establish alleyways and strips maintained by mulching, covering the soil surface or mechanical cultivation, including allocated a maximum percentage of bare soil surface

> Conserve the orchard by managing at least 5% of the entire farm area (excluding forests) as ecological compensation areas, with zero pesticide or fertiliser input, to enhance biodiversity (eg bird nesting boxes and perches, refuges for predators, host plants for beneficials, resistant cultivar as pollinators)

> Establish habitats to build or maintain populations of insect pests' natural enemies (beneficials). Sow annual-flowering plants in fallow areas and borders, include shrubs to provide food and shelter when planting windbreaks

> Don't practise chemical soil sterilisation

> Don't apply herbicides, especially not residual products, in regular or high doses

> Don't use non-naturally occurring plant-growth regulators, organiochloride insecticides and toxic, water-polluting or very persistent herbicides anti-oxidants to control scale insects, etc

> Don't use synthetic, non-naturally-occurring anti-oxidants to control scale insects, etc

Step 2 – Monitoring

> Key insect pest incidence and populations must be regularly monitored, using traps where available, and the data used to inform pest-management decisions. Growers must use qualified advice on pest-forecasting and decision-making

> Thresholds must be exceeded before any synthetic insecticide treatment can be made and fungicide treatments justified by forecasting model, visual monitoring or prevention strategies

> Control, registration, and annual reporting to authorities on pests, disease and weeds, and pesticides used

Step 3 – Biological control

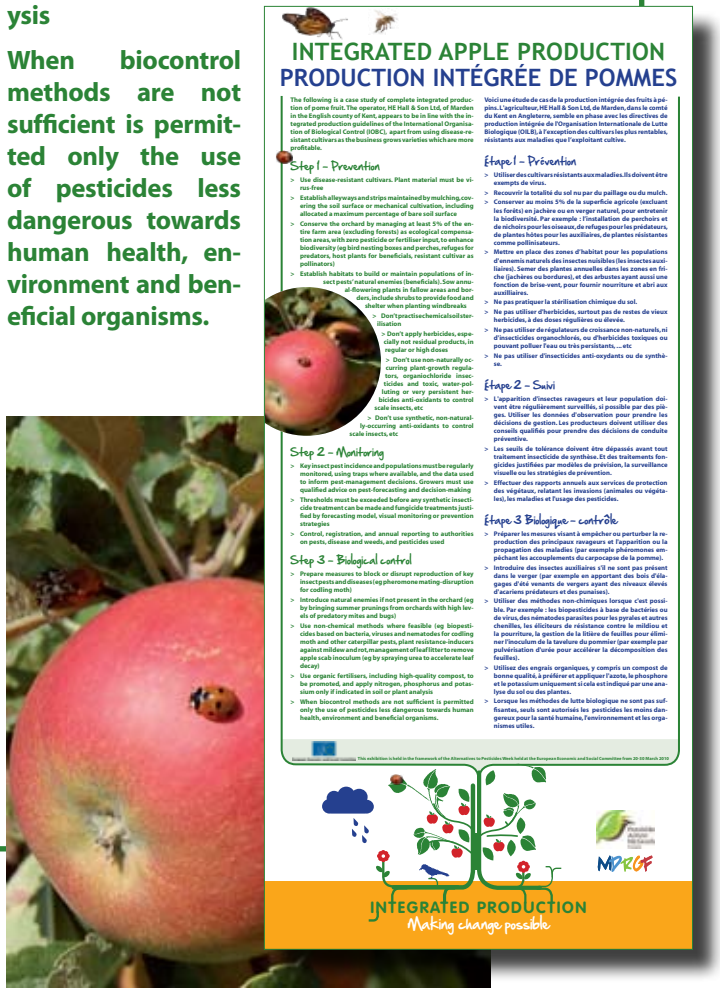
> Prepare measures to block or disrupt reproduction of key insect pests and diseases (eg pheromone mating-disruption for codling moth)

> Introduce natural enemies if not present in the orchard (eg by bringing summer prunings from orchards with high levels of predatory mites and bugs)

> Use non-chemical methods where feasible (eg biopesticides based on bacteria, viruses and nematodes for codling moth and other caterpillar pests, plant resistance-inducers against mildew and rot, management of leaf litter to remove apple scab inoculum (eg by spraying urea to accelerate leaf decay)

> Use organic fertilisers, including high-quality compost, to be promoted, and apply nitrogen, phosphorus and potassium only if indicated in soil or plant analysis

> When biocontrol methods are not sufficient is permitted only the use of pesticides less dangerous towards human health, environment and beneficial organisms.



ON THE TOP RUNG OF THE IP LADDER: APPLES

The following is a case study of complete integrated production of pome fruit. The operator, HE Hall & Son Ltd, of Marden in the English county of Kent, appears to be in line with the integrated production guidelines of the International Organisation of Biological Control (IOBC), apart from using disease-resistant cultivars as the business grows varieties which are more profitable.

On the top rung of the IP ladder

This small 124-hectare family farming business was established in 1896. Thirty hectares of apples, pears and plums are conventionally farmed, and the remainder farmed organically.

In the mid 1980s, Halls switched production to a fully integrated crop production (ICP) system. The field margins, hedgerows and waterways were enhanced, restored and managed to create the optimum habitat for predatory insects and chemical inputs were all evaluated for their environmental impact, price and efficacy.

Out went residual herbicides and cheap non-specific pesticides, to be replaced with products which left predatory insects (eg anthocorids and typhlodromus mites) to help fight difficult pests like the pear sucker and fruit tree spider mite.

The change in herbicide policy produced a flush of opportunistic annual weed species and a late summer bonanza for insect and seed-eating birds resulting in a significant increase in diversity and number. Initially, Halls struggled with the lighter touch of the ICP system, but the chemistry has become more sophisticated and insect predators more numerous. ICP is now the industry norm, and since 1997, producers have been audited annually under The Assured Produce Scheme. Halls' restoration work has produced a network of wildlife corridors throughout the farm and a haven for beneficial insects around production areas.
All expected bird species are visiting, resident or breeding in significant numbers.

The farm is an active member of Operation Bumblebee, and plantings of nectar rich plants have taken place across the farm to help revive the fortunes of this iconic species.

Key points

- **Eliminated use of all organophosphate pesticides**
- **No use of general insecticides**
- **No use of residual herbicides over last 15 years**
- **Use of pheromone traps to disrupt mating of codling moth**
- **Reduction in pesticide use has helped improve soil structure**
- **Clover planting in orchard rows helps increase habitat for beneficial insects and reduce nitrogen inputs**

DON'T LET PESTICIDES MAKE YOU SICK!

Studies increasingly point to links between the cancer epidemic and other illnesses, and exposure to certain chemicals, including pesticides. Exposure takes place at work and at home, through pesticide spraying in agriculture, parks, schools, or on house plants, and via pesticide residues in food and drink. Children are especially vulnerable and unborn children can be affected in the womb.

The Health and Environment Alliance (HEAL) launched the Sick of Pesticides Campaign with other organisations to highlight the adverse health effects of pesticides and to provide educational and advocacy tools for local health groups, schools and farmers. We are calling for pesticide-free zones and the immediate phasing out of the most harmful pesticides.

One recent activity is the creation of Europe's first network for people with health problems related to pesticides exposure with Mouvement pour le droit et le respect des generations futures (MDRGF) in France. Testimonies of those in the network can be found at www.victimes-pesticides.org. The network aims to share expertise and calls for a better protection.

In 2010, HEAL is expanding its activities from France and the UK to Belgium, the Netherlands and Hungary. Activities include contributing to the development of national pesticide action plans. Find out more at: www.pesticidescancer.eu.

The Health and Environment Alliance (HEAL) raises awareness of how environmental protection improves people's health, and works to promote health through strengthening European policies. HEAL is a diverse network of over 60 citizens', patients', health professionals', women's and environmental groups. www.env-health.org and www.pesticidescancer.eu.

Mouvement pour le Droit et le Respect des Générations Futures (MDRGF) aims to apply the 'principle of responsibility' in the agriculture context through citizenship action. For the past 15 years, it has been actively promoting agricultural practices which are free of pesticides and GMOs in order to protect the environment and prevent any form of pollution now and for future generations. Each year, MDRGF coordinates the "Week without pesticides" event, which is being held from 20-30 March 2010. www.mdrgf.org

BEE-FRIENDLY COMPETITION

Promoting best practice and raising awareness among farmers

The adoption of the EU directive on the sustainable use of pesticides means that EU farmers will be obliged to apply integrated pest management as from 2014.

PAN Europe wishes to mobilise farmers to begin using sustainable farming practices which can protect our health, the environment and biodiversity, and help combat climate change, starting by robustly practising integrated pest management.

We believe that one of the keys to success is encouraging trail-blazers. To support this goal, we are launching a competition to find the 'European IP Farmer of the Year'.

As 2010 is the United Nations' International Year of Biodiversity, we are focusing on the need for bee-friendly IP, in response to the recent phenomenon of large-scale bee deaths. Naturally, this matters economically to bee-keepers, but it also carries the risk of other serious consequences as many crops are pollinated by bees. We do not yet fully understand the causes of the syndrome, but they may include environmental change-related stresses, malnutrition and pesticide use.

Who can compete?

European farmers are invited to answer a short question- naire. If you are a farmer and are interested in taking part in this competition, please send an e-mail to henriette@pan-europe.info

Choosing the winner

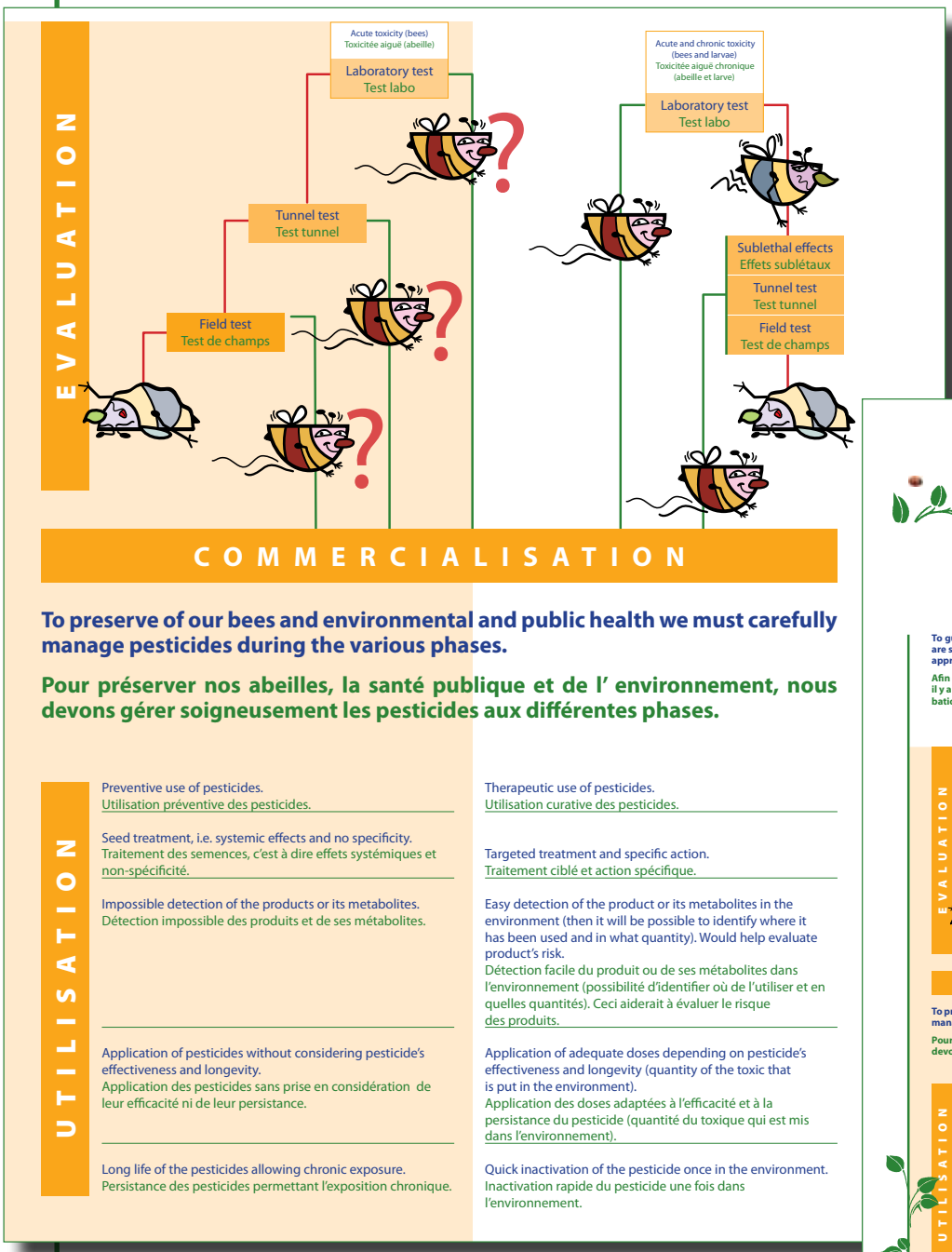
Our national members will select the best practitioners based on the survey's results. From the national winners' shortlist, a selection committee comprising PAN Europe-appointed independent experts, will choose the bee-friendly EU IP farmer of the year.

Announcing the winner

The 2011 Bee Friendly IP Farmer will be announced during the March 2011 Alternatives to Pesticides Week.

PESTICIDES & BEES

To guarantee the harmlessness of a pesticide for bees and environment there are several phases to bear in mind : evaluationg the product's toxicity, product approval if no toxic effects are identifed and correct use in the fields.

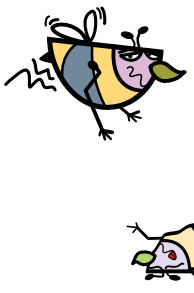


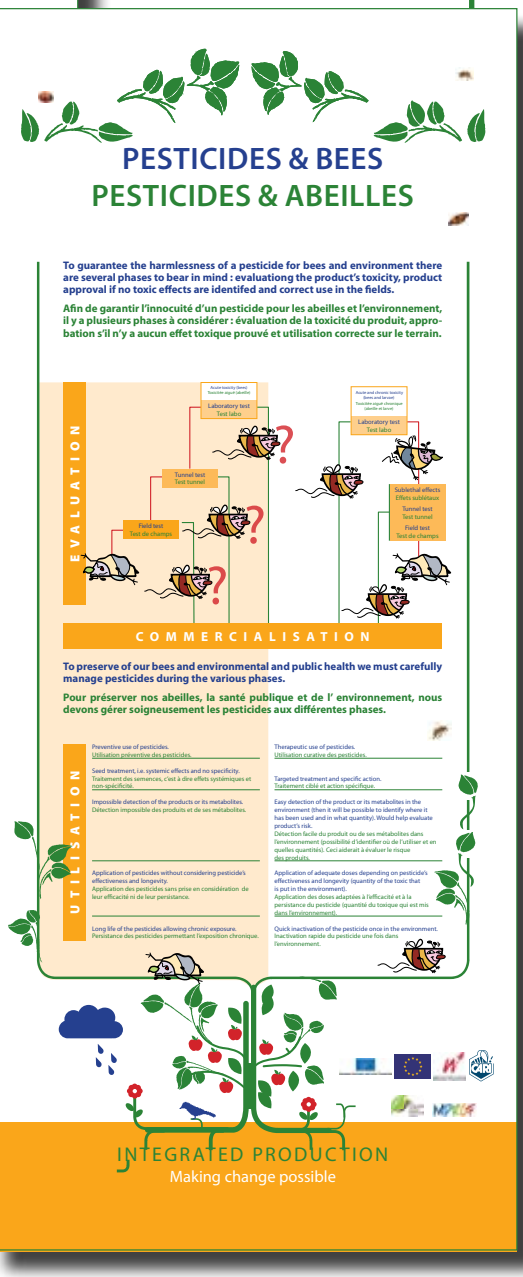
To preserve of our bees and environmental and public health we must carefully manage pesticides during the various phases.

Pour préserver nos abeilles, la santé publique et de l' environnement, nous devons gérer soigneusement les pesticides aux différentes phases.

UTILISATION

Preventive use of pesticides. Utilisation préventive des pesticides.	Therapeutic use of pesticides. Utilisation curative des pesticides.
Seed treatment, i.e. systemic effects and no specificity. Traitement des semences, c'est à dire effets systémiques et non-spécificité.	Targeted treatment and specific action. Traitement ciblé et action spécifique.
Impossible detection of the products or its metabolites. Détection impossible des produits et de ses métabolites.	Easy detection of the product or its metabolites in the environment (then it will be possible to identify where it has been used and in what quantity). Would help evaluate product's risk. Détection facile du produit ou de ses métabolites dans l'environnement (possibilité d'identifier où de l'utiliser et en quelles quantités). Ceci aiderait à évaluer le risque des produits.
Application of pesticides without considering pesticide's effectiveness and longevity. Application des pesticides sans prise en considération de leur efficacité ni de leur persistance.	Application of adequate doses depending on pesticide's effectiveness and longevity (quantity of the toxic that is put in the environment). Application des doses adaptées à l'efficacité et à la persistance du pesticide (quantité du toxique qui est mis dans l'environnement).
Long life of the pesticides allowing chronic exposure. Persistance des pesticides permettant l'exposition chronique.	Quick inactivation of the pesticide once in the environment. Inactivation rapide du pesticide une fois dans l'environnement.





BEE IN THE ENVIRONMENT

The large foraging area covered by bees not only provides a wide variety of nutrients, but also allows an extended exposure to whatever substance existing in the environment. In this foraging area, a bee colony collect 10.000.000 samples per day (10.000 foragers - 10 flights - 100 uptakes per flight)

Air

Pollutants suspended in the air in molecule form or as dust, can get attached to the surface of the bee's body and either affect it directly or be carried back to the hive.

Pollen and nectar

Bees need a lot of water I.a. for rearing the brood, which is collected from exudates from young plants, morning dew or superficial water (lakes, ponds, etc). Unfortunately, residues of chemicals can be found in all these sources of water whenever seed and soil treatments with chemicals are carried out.

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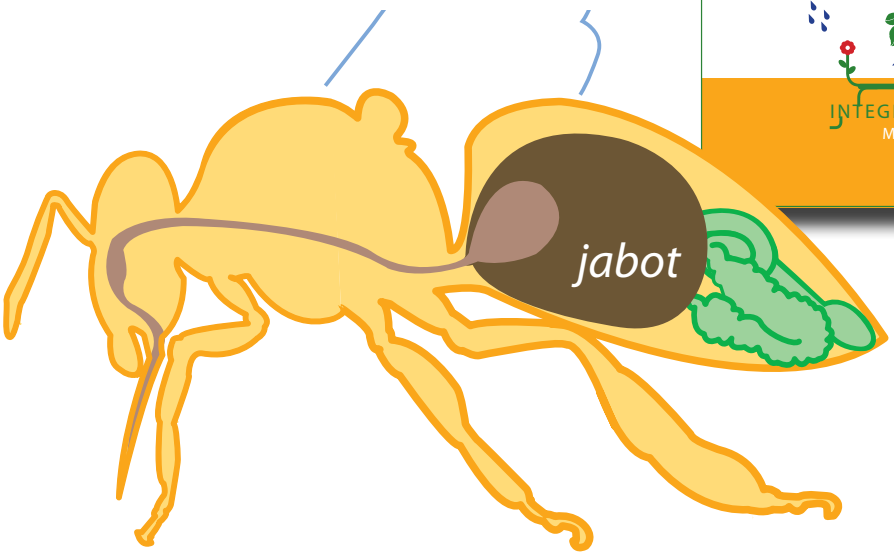

GMO AND BEES...?

The genetically modified plants occupy approximately 100 000 hectares in open fields in Europe, despite strong resistance from the population.
The current GM crops are predominantly two types : crops resistant to herbicides and crops carry a toxin character insecticide called Bt (Bacillus thuringiensis).
No direct effects of GMOs is currently described in the bee, although horizontal transfer of modified genes is possible (that means, when a bee is fed a food with genetically modified, the modified gene is found in microorganisms from its digestive flora).
Anyway the indirect effects on bees are real.

Pollen GMOs!

GMOs can pollute the products of the hive. Contamination of bee products. Note that beekeepers have no way of knowing whether the bees were busy, or not, a GM crop, the location of these cultures were not disclosed.

GM crop = honey bees prohibited area?

Bees forage in a radius of 3 Km, which means a distance of pollination up to 6 km. Therefore we cannot talk about the « safe areas » established by states between GM and conventional crops. Areas with GM crops are de facto or become short-term zones « bees not allowed ». Is this what we want?

Soybeans GM or bees?

In Argentina soybean production, GM's more than 90%, covers 19 million hectares, where herbicides are used heavily, destroying the flora. Beekeeping is declining gradually as the advance of soy, because the bees are still a source forage.

WHERE ARE THE BEES ?

The mysterious ailment called colony collapse disorder (CCD) has wiped out large numbers of the bees that pollinate a third of our crops the world over. Losses in USA were up to 40% in 2007. In the EU the losses vary from 5% to 30% in 2007-08. This phenomenon has also been called bee-declining syndrome, since it is characterised by a sudden vanishing of bees from well-replenished hives and a lack of worker bees to take care of the queen and the brood.

Pesticides

Depending on dosis, pesticides can alone cause mortalities; in conbination with other factors even lower doses are mortal.
Some of them disturb the immune system of the colonies.

Nutritional deficit

The nutritional impoverishment may come hand in hand with the lack of biodiversity of pollen and nectar or the lack of cultivation of plants interesting for honey production (like rape seed, sunflower, trifolium...).

Pathology

Like all the animals, bees are confronted to numerous pathologies. Most of them can only take place in thet weaken bees immune system conditions.

BEES & LANDSCAPE

Bees need a varied landscape in order to develop their colonies. Hedges, bushes, shrubbery, flower meadows contribute not only to give value to the landscape, but also determine their well-being.

Bees need a diverse environment, where crops are interspersed with hedges and rows of wood or grove, where there are wetlands and grassland can still flourish.
Apart from honeybees, these landscape elements also benefit wild bees. Unfortunately, the biodiversity of our landscape is deteriorating in wide regions. Therefore some species are declining, as well as beneficial insects, predators of crop pests, valuable auxiliary of the farmer.
Diversification of agricultural land also contributes to the landscape quality, which is enjoyed by animals or even hikers, but also and primarily to the farmers themselves who develop their life and activity there

Many agro-environmental measures exist that allow farmers to maintain or restore these landscape elements while maintaining the profitability of their operations.


GIREA


NATAGORA

BEES AND PULSES

Each year Europe imports some 30 million tonnes soybean meal. This huge reliance limits Europe's food autonomy and deprives its farmers of an « added-value » crop and an important contributor to crop rotation.
Devised to protect essential crop production in the infant European Union, the Common Agricultural Policy (CAP) has inadvertently made Europe dependent on imported protein crop products. This reliance has over the years been written into the international trade agreements, where our continent has committed to restricting natural and social consequences disastrous.
In main exporters of soybean like Brazil and Argentina the production of soybean is, accompanied by the destruction of rainforest

The forests and the pampas... and the farmers

The growth of soybean cultivation has destroyed tens of millions of hectares of rainforest and the pampas of South America. Cultivating protein crops in the EU would allow the conservation of such important environments for biodiversity.

This also resulted in the removal of hundreds of thousands of smaller agricultural farmers ni South-America. By cultivating proteins in European, our farmers will regain control of their feed ingredients and recover a value that is currently lost, at the same time that smaller farmers in Latin America might recover land to cultivate food crops.

Pulses : bees have everything to gain

These crops are in most of the cases very interesting for honey production, both in quality and quality. From one hectare of alfalfa up to 350 Kg of honey can be produced.

Less pesticide

Monoculture soybean is normally associated with an intense use of pesticide (200 million litters per year in Argentina). The recovery of food crops in producing countries and the introduction of pulses in crop rotation on the European side would help reducing the pesticide use in North and South.

The return of rotation

By importing tens of millions of tons of protein the nitrogen cycle is unbalanced resulting in pollution of groundwater by nitrates. Growing more pulses, which are excellent heads for rotation, enrich the soil with nitrogen, facilitating the soil work and breaking the cycle of pests, reducing input requirements.

HELPFUL GARDEN INSECTS

Many insects

(such as ladybirds, lacewings and hoverflies) are fierce predators of pests like aphids, mites, slugs, and mealy bugs.

They are attracted by flowers, native trees and shrubs, good provision of shelter, a diverse range of plant species, and the absence of chemical treatment.

Mammals and amphibians also form part of the arsenal which gardeners can count on to protect the garden from many pests.

Birds feed on caterpillars, diurnal and nocturnal raptors attack voles, and hedgehogs and shrews are always on the lookout for slugs.

HOW TO GARDEN WITHOUT USING PESTICIDES?

ADALIA is an association which aims to reduce pesticide use by telling people about:

> The problems pesticides pose to the environment and public health
> Existing pesticide-free solutions which allow efficient garden upkeep

Here are some simple ways to limit pesticide use:

Prevention, biological measures, trapping pests alternative ways of weeding, better garden management, using natural products, mechanical methods