PAN Germany
Pestizid Aktions-Netzwerk e.V.

For the Consideration of

Biodiversity in Plant

Protection Legislation

zwitschern zart nahrung
bunt hafer falter luzerne
biene dinkel wohlfühlen
erde leben storchwiese
VIELFALT VERSUS PESTIZIDE
Pestizid Aktions-Netzwerk e.V.

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Contents

The progressive loss of biological diversity

Biological diversity consists of three elements: the diversity of species, genetic diversity within individual plant and animal species, and the diversity of habitats. These three aspects of biological diversity are closely connected and mutually influence one another. This diversity is threatened.

For a long time, biological diversity was taken for granted. The realisation that biodiversity is a common good that must be safeguarded, that it is a finite good and that its protection requires great efforts, first materialized among experts and has now become generally accepted. This realisation manifested at international level in 1992, in Rio de Janeiro, at the Earth Summit (UN Conference on Environment and Development), when the "Convention on Biological Diversity" (CBD) was adopted. There are 190 contractual partners, and by 2008, 168 states as well as the European Union, had signed the agreement. The states that have signed the agreement pledge, according to international law, to preserve biological diversity. The CDB contains three aims of overriding importance; the preservation of biological diversity, its sustainable use, and access and benefit sharing. The Conference of the Parties takes place every two years. In May 2008 Germany was host to the 9th Conference of the Parties (COP). The international community's aim to stop the loss of biological diversity can only be achieved if concerted efforts are made on an international, national and regional level and all areas of policy-making are involved. No matter if it's about the loss of crop species or the reduction of the area of ancient forests, human beings are responsible, either directly or indirectly, for most of the causes of the loss of biological diversity. Time is running out, as the depletion is taking place at great speed: the present estimated rate of extinction is 100 to 1000 times greater than under natural conditions. Between 1970 and 2000, the species richness fell by 40% worldwide. According to the "Red List of Threatened Species" published in 2006 by the International Union for the Conservation of Nature (IUCN), 15,500 species are greatly endangered, including 23% of all mammals1. Complete ecosystems, such as the tropical rain forests, which constitute one of the "Hot Spots" of biological diversity, are threatened.

Loss of species in Germany

62% of all amphibians and reptile species are placed on the Red List as endangered or threatened by extinction .

30% of our indigenous ferns and flowering plants are threatened.

40% of our wild animals are threatened.

70% of our ecosystems are threatened.

Considering that our knowledge of biological diversity is still very limited, these figures are all the more alarming. Of the estimated 10 to 100 million species on the planet, only 1.8 million species are "known". Many of these "known species" only have a scientific name. Nothing is known about the characteristics of these species, their mutual interaction with other species and about their position in ecosystems. Only 40,000 species have been studied to determine the extent of their endangerment.2, 3 In view of these facts, the extent of the challenge of protecting biological diversity and its sustainable use, becomes apparent.

Humans take what they need from nature: food, raw materials, and medicine. Nature supplies the human race with clean water and provides us with services, such as the filter function of the ground or the recreational function of the Ecosystems. The insidious loss of biological diversity becomes apparent later in technological societies than in societies that live directly from nature, where there is no possibility of compensating technologically for the losses resulting from damage to natural regulatory systems. For example, when fish stocks are exhausted due to over-fishing, the fishermen, their families and whole village communities suffer from hunger. People in industrial nations only notice the dramatic change due to rising prices, but they have the choice of buying other foods.

With the concept of "ecosystem services", an attempt is being made to estimate the economic value of biological diversity. It has been calculated that globally, eco-systems provide important services to the value of about 26 trillion euros a year. This sum is far greater than the annual world gross social product.[4] Despite this impressive figure, there can be no purely economic evaluation of natural systems. Biological diversity has an intrinsic value. However, as biological diversity cannot defend itself, attempts are being made by way of agreements, contracts and action plans at international, European and national level, to counteract the loss of biological diversity. In Germany, in 2008, – after 10 years of preparation – the National Biodiversity Strategy and Action Plan was published.[5] One of the concrete visions named in the plan is the aim to secure and increase the population of the majority of species (in particular of wild species) which typically live on agricultural land, by 2015. The surface area of agricultural biotope (high-quality grassland, traditional orchards) suitable to nature conservation should increase by at least 10% in comparison with 2005. By 2010, the proportion of semi-natural landscape elements (e.g. hedges, balks, field woods, small water courses) should reach at least 5%. At present, it is around 2.5% on average. This target seems difficult to achieve in view of the increasing conversion of fallow and grassland into areas for the cultivation of intensive renewable resources for the energy and fuel industry.

At European level measures have also been initiated to protect biodiversity. The European Parliament passed an action plan in May 2007 containing concrete measures to stem the loss of biodiversity by 2010. The parliamentarians considered it important to not only quickly broaden protection measures, but also to integrate these measures into other fields of policy-making, in order to achieve coherency in the protection of biodiversity in the whole legislative framework. The text of the resolution specifies five determining factors that are largely responsible for the loss of biological diversity.[6] Intensive agricultural production methods are one of the determining factors.

A future without diversity?

Worldwide there are:

1,800,000	scientifically defined plant and animal species
30,000	known edible plant species
7,000	of these have been cultivated
150	species are used for nourishment and clothing
30	species account for 95% of plant food sources
10	species are cultivated and form the basis of global food sources

What shall we live off tomorrow?

A Note on Agrobiodiversity

Agriculture has a substantial influence on biological diversity, if only due to the large land use: over half of the land surface in Germany is used for agricultural purposes, about 70% of which is arable land and 30% grassland. Therefore, protection of biological diversity also means protection of agrobiodiversity. The Food and Agriculture Organization of the United Nations (FAO) defines agricultural biodiversity as the diversity of the directly used and usable living organisms which are used by human beings. This includes crops, (including their wild types), forest plants, domestic animals, animals for hunting and other useful wild animals, fish and other aquatic living creatures, useful micro-organisms and other lower organisms.[7] Other definitions are wider and include all resources within arable, forest, pasture and aquatic ecosystems.[8]

The loss of biodiversity is particularly apparent in the sector of agrobiodiversity. The international community relies more and more on fewer species of crops to provide for basic needs, and within these species the genetic spectrum is becoming increasingly limited. Now, experts have come up with the term “genetic erosion” for the loss of genetic diversity within species. This applies particularly to cultivated species such as wheat, rice, or maize.

Of the thousands of different varieties that humans have cultivated in history, only a handful remains today. Agrobiodiversity also decreases with the falling number of cultivated field crops. Agricultural technology, the green revolution, the increasing market domination of a few multi-national seed companies, the industrial processing of agricultural goods and global trade with its standardisations, are driving forces in the standardisation of cultivated crops and culture species.

The impact of pesticides on biological diversity

Various determinants play an important role in agriculture with regard to biological diversity, as shown in Table 1. It is often difficult to separate the individual aspects and their effects on biological diversity from one another. The choice of crop, the type of crop rotation and the use of fertilizers and pesticides co-determine which plants and animals survive and establish themselves on agricultural land, which are displaced or harmed, and whether natural regulatory systems are disrupted or supported. Pesticides allow the type of agriculture that contributes to the loss of biological diversity. Special attention must therefore be paid to coherency between the protection of biodiversity and pesticide legislation (Chapter 3).

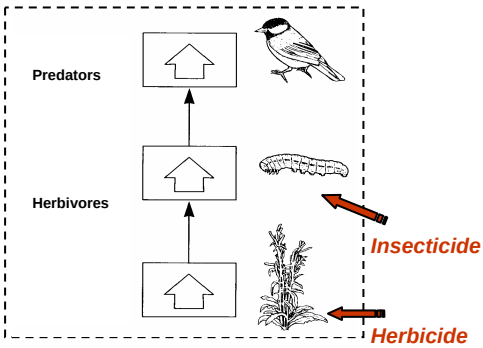
The use of pesticides affects biological diversity in three ways. Firstly, pesticides enable certain methods of cultivation that would otherwise be almost impossible without their use, such as monocultures, tight crop rotation or the cultivation of crops that are hardly adapted to the site. Secondly, pesticides can damage organisms directly, for example aquatic coenosis, if they enter surface water. Thirdly, they indirectly affect habitats, as the use of pesticides deteriorates the quantity and quality of food sources for wild animals, or in the long-term, causes a shift in the composition of species in ecosystems.

Table 1: Influences of agriculture on biodiversity	
Determining factors	**Characteristics**
Cultivation Methods of *w*orking the soil, fertilizing, harvest techniques	Tillage or non-tillage practices, mulch sowing, direct sowing, with or without pesticide use; fertilizer type (chemical, mineral, organic); harvesting with or without pesticide use, with or without, e.g. straw removal (type, intensity, frequency, time)
Cultivated crops Crop rotation, choice of type and variety	Number of rotating crops; alteration between summer/winter crops, leaf /stem crops. Variety: traditional, regional, or hybrid types
Structure Size and form of cropland, contact with landscape components	Presence of free strips on the borders of arable land, hedge banks, hedges, trees, groups of trees and bushes, waters etc., as space for exchange, retreats, food sources and habitats, and breeding grounds for living creatures.
Genetic engineering Herbicide resistant plants, insecticide plants, terminator technology	Active substance gap (risk of resistances), species crossing (uncontrollable transfer of manipulated genetic information to formerly unaltered cultivated and wild plants)

Every year, about 35,000 tons of pesticide active ingredients are used in Germany, mainly on arable land, in orchards and for growing vegetables. Farmers use pesticides to protect agricultural products from competition (grasses and weeds), fungi, pests and disease. Only a few studies have been carried out on the negative effects of pesticides on biological diversity on open land. Within the framework of pesticide registration, the direct effects of individual active ingredients on so-called „representative organisms“ are examined by the authorities concerned. Conclusions are drawn from laboratory results as to how active ingredients act on the environment. Registered pesticides can still, however, prove to be harmful to certain biocoenosis or non-target organisms, despite thorough inspection and compliance with the rules of usage. Two examples follow.

Broadband herbicides and insecticides contribute to a significant reduction in the food sources for birds and small mammals in agricultural ecosystems. Studies on the populations and breeding rate of the titmouse, as a representative of other predators, show the indirect effects of pesticides. The reason for this is that the titmouse searches for food on sprayed areas far longer than on untreated areas. Their mortality rate is greater on sprayed ground than on untreated areas, and the breeding rate is significantly lower. The repeated use of pesticides during the breeding season is particularly problematic.[9] These results have been confirmed by more recent studies that showed positive results after the conversion from conventional to organic farming, not only on avifauna but also on arthropods, spiders, earthworms and other organisms.[10]

Indirect effects of pesticides on avifauna



Bottom-up Modell by White on the control of trophic levels in terrestrial biocoenoses. According to K. Martin (2001): Biologie der Biozönosen. S. 224. Springer Verlag.

Apart from the indirect effects, the direct harmful effects of pesticides on non-target organisms have been confirmed. Open land and laboratory studies in Mecklenburg-Western Pomerania (Germany) documented the direct negative influence of pesticides on amphibians (on the fire-bellied toad and the moor frog).[11] Despite observance of the rule stipulating a 20 metre distance from waters, as laid down in the rules of good agricultural practice for pesticide use, environmentally relevant concentrations of Isoproturon and Cypermethrin were found in the surface waters of agricultural landscapes and in the spawn and larva found there. Isoproturon is a widely used phenylurea herbicide used on grasses and field weeds in corn cultivation. Cypermethrin is a widely used insecticide of the synthetic pyrethroid group that is used against biting and sucking insects in agriculture and forestry. These pesticides caused morphologic alterations and behavioural abnormalities in the larva of amphibians, such as bent tail-ends, oedema and curved spines. They also caused a decrease in the breeding rate, shortened the period of metamorphosis, and had adverse effects on growth.

The fitness of animals can also be adversely affected long after pesticides were applied; for example adult animals can be more susceptible to stress factors such as drought.[12] With regard to species such as the fire-bellied toad, these results are alarming. If measures are not taken as quickly as possible to protect it from the harmful effects of pesticides, this animal will soon no longer be found in our landscapes. At EU level, the fire-bellied toad is protected by the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive), where it is listed in Appendixes II and IV. Species that are listed in Appendix IV, such as the fire-bellied toad, are mainly found outside conservation areas. It is therefore necessary to extend protection measures beyond the borders of conservation areas which have to be introduced by the EU Member States. In Germany, the fire-bellied toad is listed in the Red List as a species “threatened by extinction” and according to the Federal Nature Protection Act it is to be treated as a “species requiring particular protection”. It is forbidden to catch, harm or kill these kind of species, or to remove or damage their nesting and breeding grounds, their habitats or places of natural retreat.[13]

The above example makes it evident, however, that despite the fact that plant protection regulations have been complied with, protected animals are still harmed or killed. It becomes apparent that the modulation of pesticide exposure used in the registration procedures for Isoproturon was not secure, suggesting that the protection of biodiversity is not yet sufficiently integrated in plant protection legislation. The question arises as to whether the required coherency between the requirements of biodiversity protection and the requirements of plant protection exists, and whether there are possible gaps that must be closed.

Biological diversity in plant protection legislation: political strategies and legislative approaches

Many laws and political agreements aim to protect species and biodiversity. They include international conventions such as the International Trade in Endangered Species of Wild Fauna and Flora (CITES), European directives such as the Habitats Directive, the Birds Directive or the Water Framework Directive, as well as German federal laws such as the Federal Nature Conservation Act. When the various laws are drafted, it must be ensured that they do not have opposite goals and that their aims do not hinder one another. Care must be taken to make legislation coherent, particularly in specialist laws such as the Plant Protection Act or the corresponding EU pesticide legislation. Here, the question arises as to how biodiversity, the subject of protection, is taken into consideration in present and future pesticide legislation.

The German Plant Protection Act

The use of plant protection products is regulated by the German Plant Protection Act. For a long time, the Plant Protection Act from 1986 was considered exemplary because, among other reasons, “the natural balance” (“Naturhaushalt”) was introduced as subject of protection.[14] In its judgement in January, 2006[15], the Court of Justice of the European Communities decided that the German Plant Protection Act does not take adequate account of particularly protected plants and animals, as it only called for pesticides not to be used “if the user must expect that their use in individual cases will have a harmful effect on human and animal health or on groundwater or have any other serious adverse effects, especially on the natural balance”. Germany was reprimanded by the ruling of the European Court of Justice and was obliged to make improvements, as the Habitats Directive 92/43/EEC from 1992 clearly expresses the clear and binding prohibition of harm to endangered, particularly vulnerable species. This directive not only prohibits any encroachment on these species but also any harm that may be inflicted on them.

The Plant Protection Act was revised in 2007. When the amended version came into force in March 2008, the approximation of the specialist law with the EU legislative norms of the Habitats Directive had taken about 14 years. In future, according to the amendments in § 6 of the Plant Protection Act, it is forbidden to harm, kill or remove particularly protected wild animals and plant species or their developed stages from their natural surroundings. Strictly protected animal species and European bird species may not be significantly disturbed (e.g. during the rearing of their young or during molting) and their habitats, breeding sites and resting places, must also not be damaged or destroyed.

This is positive from the point of view of a more effective protection of biodiversity. However, the question remains as to how these regulations will be put into practice by farmers, what changes are necessary in agricultural advisory services and how authorities will control these statutory provisions. As a precaution, in their decision on the

amendment of the Plant Protection Act in February 2008, the State Agricultural Ministers have included the possibility of granting permission in exceptional circumstances. The criteria according to which these exceptions will be granted, is, as yet, unclear. It is expected that the implementation of the Habitats and the Birds Directive measures in the field of plant protection will take considerable time.

Council Directive 91/414/EEC concerning the placing of plant protection products on the market

Biodiversity would be best protected by prohibiting the use of pesticides that endanger biological diversity. Council Directive 91/414/EEC constitutes the legal foundation for the authorisation of active ingredients and the placing of plant protection products on the market. The European Commission hereby makes decisions on which active ingredients are permitted in commercial pesticide products. Based on this, the Plant Protection Act regulates product authorisation in Germany. Apart from the effectiveness of the pesticides, the official risk assessment evaluates how dangerous the pesticides are and what risk they present to humans and the environment. There are, hereby, no specific parameters for evaluating the effects of the pesticide on biodiversity. During the risk assessment, laboratory tests are carried out on a small series of so-called "representative organisms". The species and test procedures are, as a rule, determined by international and European guidelines. It is of little importance whether the tested species are found in the region where the pesticide is to be used or whether their sensitivity is similar to that of species found in that area. In the test the transferability and reproducibility of the results are the main considerations determining the choice of organisms and procedures. As yet, there is no testing strategy to evaluate the effects of pesticides on species requiring special protection. A further deficit of the official risk assessment is that, in general, each pesticide is evaluated individually, whereas in practice, tank loads of mixtures of various pesticides are used and different forms of contamination are found in the soil, waters and in living creatures. An examination of the possible cumulative effects on organisms and living communities is generally not carried out. Another problem is the lack of standard tests to assess endocrine disrupting effects of pesticides, although it has been proven that chemical substances, even in their lowest concentrations, can disrupt hormone function. The endocrine effects of the fungicide Vinclozolin or the antifouling TBT on animals and humans have been proven. Changes in the hormonal system lead to alterations of and damage to cell and organ development and harm the reproductive system. They can also lead to neurological impairments, behavioural changes, or to the development of cancer. In addition, in ecological systems disruptions of inter-species communication caused by pesticide and other synthetic chemicals appear to have considerable, previously underestimated, negative effects, which can potentially be far more harmful than the damage done to individual organisms. Examples of this are the disruption of the predator-prey interaction in aquatic systems, alterations in host relationships, and the symbiosis and alterations in pheromone-guided reproductive behaviour, whereby the male is no longer able to identify the female via its attractants.[16]

The German Programme for the Reduction of Chemical Plant Protection Products"

The German Programme for the Reduction of Chemical Plant Protection Products has been in force since the beginning of 2005.[17,18] With the aid of various measures, its aim is to restrict the use of chemical plant protection products to the so-called "minimum necessary", and to do this more severely than previously, in order to avoid the unneces-

sary use of pesticides. The indicator SYNOPS is used in the reduction programme to evaluate the environmental risk caused by pesticides. The risk model calculates the risk potential to terrestrial and aquatic organisms. User data, data from exposition models and from standard tests on representative organisms are linked. The model describes the possible risk to the natural balance but does not include any special assessment categories for the preservation of biological diversity.

In February 2008, after several years of revision, the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) presented a revised version of the reduction programme to the specialists in the field. In this version the term biological diversity appears for the first time, at least, in the introduction. The assumption is made that "fewer risks to the natural balance" can contribute to the preservation, or even to the promotion of biological diversity and that therefore, the reduction programme constitutes a fixed component in the National Strategy on Biological Diversity.[19] The results of trends observed in environmental monitoring serve as a new additional indicator. Monitoring data are drawn on, which had already been obtained during the implementation of the Water Framework Directive. The terrestrial sector is not mentioned and concrete targets for protecting biological diversity are not stated. This is also reflected in the package of measures, which does not include any measures on the protection of biological diversity. Insofar, there is no direct relationship to the goals of the Federal Government's National Strategy on Biological Diversity, according to which the populations of the majority of species living in agricultural landscapes shall be secured by 2015, and thereafter, should begin to increase again.

Great Britain is already a step ahead. In the development of the UK pesticide reduction programme, close links are made with the measures taken to preserve biodiversity. One of five expert groups in the British reduction programme is solely concerned with the subject of biodiversity. One of the targets is to stop the decline in the bird population on agricultural land by 2010. Yearly inspections of bird populations are part of the reduction programme.[20]

The Thematic Strategy on the Sustainable Use of Pesticides in the European Union

Already in 1993, the Council and the European Parliament passed the 5th Environmental Action Programme. One of the goals was to "significantly" reduce the use of pesticides in agriculture by the year 2002. This goal has not been achieved. On the contrary, the use of pesticides in the EU has even risen slightly.

The EU accounts for almost one quarter of the world market for pesticide products. In mid-2002, the 6th Environmental Action Programme formulated the aim of a more significant reduction in the use of pesticides more clearly and recommended a two-pronged strategy. On the one hand, the existing EU regulations should be revised and the coherency with other goals of environmental protection, such as the preservation of biodiversity, should be scrutinized. On the other hand, a large gap in the European pesticide legislation regarding the use phase of pesticides should be closed. A harmonised EU legislative framework for placing pesticides on the market as well as for the regulation on pesticide residues and pollution (e.g. in food and waters) already does exits. However, there is no harmonised legislation in the EU on the use phase of pesticides. In the summer of 2006, after several years of discussions, the European Commission presented a complete package of revised and completely new drafts on pesticide regulation. At the centre of the package is the Thematic Strategy on the Sustainable Use of Pesticides or, as the case may be, its related framework directive.

According to the Commission's proposal made in the framework directive, all Member States should develop National Action Plans, similar to the political programmes developed in Denmark, the Netherlands or Sweden since the 1980s, and which Germany has developed in the "Programme for the Reduction of Chemical Plant Protection Products".

The success of such action plans regarding pesticide reduction can be seen in Denmark, a forerunner in this field. There, agricultural products contain six times less pesticide residue than the EU average, and water quality has increased considerably since the introduction of the plan. Concrete targets and timetables, such as those in Denmark, are necessary in order to send out a signal to the Member States. However, the Commission's preliminary draft foregoes this. A further step in the right direction is the establishment of the Integrated Crop Protection and Integrated Pest Management (ICM/IPM) as a mandatory procedure in conventional agriculture. Here, preventative and non-chemical procedures are given preference over chemical plant protection products. According to the Commission's draft, obligatory standards will be implemented by 2014. This appears, however, to be too weak as instrument, as in Germany the Plant Protection Act (§ 2a) as well as the general principles on good practice in plant protection already contain the maxim to carry out plant protection according to the principles of integrated plant protection. ICM/IPM has, in fact, only developed to a notable extent in a few cultures, such as in apple cultivation. Mandatory crop and regionally specific ICM/IPM standards would prove to be much more promising than general standards. Further proposals from the Commission concern improved education and training for farmers, prohibition of spraying from aeroplanes (with strictly limited exceptions), improved protection of waters , for instance by buffer zones, as well as a strictly regulated use of pesticides in or around protected areas, such as Habitat 2000 regions.

The revision of the Authorisation Directive 91/414/EEC (see above), which will become a regulation and must therefore be put into practice at national level, also has great potential to reduce the risks and the use of dangerous pesticides and of achieving positive results in biological diversity. By implementation of the substitution principle and comparative evaluation it should be made sure that, for the first time, problematic substances are taken off the market and replaced by less dangerous ones. In addition, cut-off criteria should ensure that known substances of high concern may no longer be used, for example, active ingredients which are persistent, bio-accumulative, acutely toxic, carcinogenic, mutagenic, or toxic to reproduction, or which influence the endocrine system of humans and animals. The European Parliament made a cross-party declaration on the need for the clear strengthening of prevention, health and environmental protection. For the first time ever, direct reference will be made to the protection of biodiversity, ecosystems and the populations of endangered animal and plant species in the revised regulation text. The parliamentarians also considered it important to integrate paragraph 175 of the EU Treaty on the aims of environmental protection in the draft of the regulation, so that the authorisation of pesticides is not only classified under health protection.

The conclusive vote of the EU parliamentarians is only the first step towards a compromise between the Commission, the Council of Ministers and the Parliament. This means for PAN to continue to do all it can during the course of the debate, until the new law comes into force (probably in the first half of 2009), to avoid too great a backing-off in the face of strong economic interests.

The greatest problem seems to be that the value of biological diversity is difficult to express in financial terms, and it is hardly possible to counteract arguments such as, for example, the loss of jobs in the pesticide industry, or fears stirred up that the EU will no longer be able to provide itself with enough food. It is therefore important that the ideal and economic value of biological diversity is communicated better from politicians to farmers and to the consumers, in order to develop the necessary legislation and political programmes. In the field of pesticide politics there is a great chance of noticeably improving and strengthening the interests of environmental protection.

PAN's demands for the consideration of biodiversity in plant protection legislation

Support of Pesticide-free farming methods and areas

- Acknowledgement of the positive impact of organic farming on biodiversity through financial support for certified organic farming systems (at national and federal state level).
- Promotion of pesticide-free buffer zones, fertiliser-free strips around arable land and other border structures.
- Promotion of compensatory measures (ecological priority areas, landscape components, agri-environmental programmes).

Consideration of specific risk potential in plant protection legislation and pesticide registration

- Consideration of endangered species in pesticide registration and thereby, also the indirect and synergistic effects of pesticides on biological diversity, within the context of risk evaluation.
- Implementation of the precautionary principle in order to avoid the possible disruptive effects of communication between individuals.[21]
- In order to account for mixture toxicity, establishment of threshold values for sums of pesticide concentrations in the environment are necessary. This can be achieved by establishing an additional safety factor for combined effects as well as dividing individual threshold values by the number of anticipated mixture components.[22]
- Only such substances shall be permitted, which are detectable in standard analytic practice within the framework of present normal monitoring procedures .
- Establishment of biodiversity criteria in firm specifications of good agricultural practice in plant protection legislation.
- Formulating effective specifications for the reduction of efforts and special regulations for use, application, periods of application, frequency, and distance rules in ecologically sensitive regions.
- Change in cultivation in prevalence areas of amphibians. No pesticide application on spawning grounds during spawning. Restriction of time of application, taking the development phases of amphibians into consideration.

Concretion of the Programme for the Reduction of Chemical Plant Protection Products

- Creation of a direct relationship between the goals, indicators, and regulatory measures of the reduction programme and the aims of the Government's National Strategy on Biological Diversity.
- Integration of biodiversity indicators in the reduction programme.
- Designation of a binding reduction goal in the reduction programme: reduction of the intensity of the use of plant protection products, measured against the treatment index, by 25 to 30 percent (depending on the region) within 5 years.
- Concretion of the "minimum necessary" in chemical plant protection. Establishment of maximum treatment indices for individual cultures and soil climate regions.
- Binding specifications must be laid down for the reduction of pesticide effects on non-target habitats (e.g. border structures) and non-target organisms (e.g. birds, small mammals, and insects).

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