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Protect water, nature and human health

Pesticides strategy 2013-2015

February 2013

The Danish Government

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Foreword

Our aim is to protect the general public as well as nature against unnecessary toxic substances. Therefore we are proud to present the Danish Government's new pesticides strategy.

We are also pleased that the government has accomplished a broad agreement on this strategy with the opposition parties; Denmark's Liberal Party, the Conservatives, and the Red-Green Alliance. It is vital that we work together if we are to secure clean drinking water for the Danish people.

This pesticides strategy will contribute to a clean environment, good ecological status in nature, healthy food, improved health and safety at work and more green workplaces.

The goal is to reduce pesticide loads by 40 % by the end of 2015.

This is an ambitious objective, but it is also necessary if we are to ensure a reasonable balance between the interests of agriculture and protection of the environment. If we have the slightest doubt, priority must be given to nature, the environment and clean groundwater. Groundwater is a vital resource which we must secure for future generations.

We must strive towards sustainable use of pesticides, and reduce the dependency of agriculture on pesticides. We must reduce the use in every way possible, and most importantly, we must ensure that the pesticides being used, affect our health, nature and groundwater as little as possible. This new strategy constitutes a significant contribution to the green transition of agriculture.

The pesticides strategy includes a number of demands and initiatives for people using pesticides. We want to increase control measures to prevent illegal imports and use of illegal pesticides, and to ensure that pesticides are used properly.

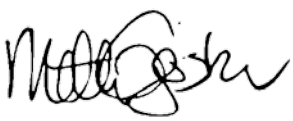
This pesticides strategy does not merely encompass demands for users; it also takes into account long-term investments in research into the use and impacts of pesticides. Among other things, we need more knowledge about combination effects and endocrine disruptors. This strategy also paves the way for more Danish influence in the EU, and it prioritises development of green pesticide spray technology which reduces the use of pesticides.

The adoption of a new pesticide tax has already created a strong basis for achieving a reduction in pesticide loads. The new tax is a good example of more intelligent regulation. Now the agricultural industry is obliged to pay for its pesticide load on human health, nature and groundwater, and as a result the majority of farmers can reduce their costs by selecting the pesticides causing the lowest load.

In the Danish Government, we are ready to supplement with further initiatives, if necessary. Therefore this strategy will be mid term evaluated after the end of 2014, with a view to adjusting our course and targeting work on a new pesticides strategy in 2015.

This new pesticides strategy was established on the basis of ideas collected from a number of workshops in which the Ministry of Food, Agriculture and Fisheries and the Ministry of the Environment worked with collaboration partners and stakeholders on finding the best possible solutions. The Danish Government wants to maintain this good cooperation in the future, when the individual initiatives are to be implemented.

Ida Auken,
Minister for the
Environment



Mette Gjerskov,
Minister for Food,
Agriculture and Fisheries

1. Introduction and goals

An ambitious goal shows the way

This pesticides strategy shall change the trend, in order to prevent continued increases in the use of pesticides, and to reduce loads on human health, nature and groundwater. With a new and ambitious goal, this strategy shows the way towards fewer pesticides and pesticides causing the lowest load on the environment and human health.

Since 2007, the pesticide load in Denmark has increased by 35 %. This development must be stopped, and accordingly the Danish Government is working for a profound change of course in its pesticides policy. The most important change will be the amended pesticides tax, which increases the cost of the pesticides causing the highest load and motivates farmers and other users to reduce their use and load.

With this pesticides strategy we also set new ambitious goals and implement a number of activities to ensure that fewer pesticides and pesticides causing lower loads are used in Denmark. The strategy includes new regulations, advisory services, training, control and information.

New load indicator - a new ambitious goal
The overall goal of the Danish Government is to reduce the pesticide load by 40 % by the end of 2015 compared with 2011. The Danish Government wants to contribute to ensuring a clean environment, good ecological conditions in nature, healthy food, better health and safety at work as well as more green workplaces.

This goal is based on the PLI (Pesticide Load Indicator) which measures the pesticide load on human health, nature and groundwater.

Benchmarks for the period
As a supplement to the overall objective, a number of benchmarks have been determined. The benchmarks indicate what the Danish Government wishes to accomplish within the various areas of special interest.

- No exceedance of the threshold values for groundwater for approved pesticides.
- The content of pesticide residues in Danish food must be as low as possible.
- Human health loads from using substances of very high concern (carcinogenic substances and endocrine disruptors) must be reduced by 40 % by the end of 2015 compared with the loads in 2011.

The pesticides strategy in a larger perspective

The pesticides strategy reflects the 2011 Government Platform “A Denmark that stands together”.

The pesticides strategy will be underpinned by a wide range of other initiatives implemented by the Danish Government to ensure better environment and human health; for instance, the Ecological Action Plan 2020. Furthermore, the Danish Government has set up an independent Nature and Agriculture Commission, which in spring 2013 will be presenting proposals on solving the financial and environmental challenges facing agriculture and nature.

The new pesticides strategy ensures Danish compliance with its commitments in relation to the EU framework directive on sustainable use of pesticides, and also focuses on the work in connection with the new pesticides regulation which entered into force in June 2011. Furthermore, to an even greater extent than now, the pesticides strategy ensures Denmark’s status as a frontrunner in the EU with respect to reducing pesticide loads.

- Anyone who uses pesticides for professional purposes must comply with the principles on integrated pest management (the IPM principles) by 2014.
- Municipalities, regions and governmental institutions must reduce their use of pesticides in accordance with the voluntary agreement for this area.
- The golf courses must reduce their use of pesticides and pesticide loads.
- Owners of private gardens must, to a greater extent, choose pesticides causing low loads.

Environmental and nature protection must go hand in hand with growth
Together with a number of initiatives and plans regarding the environment, e.g. water and nature plans, the general effort for the protection of groundwater, water and nature plans and initiatives in the area of ecology, the pesticides strategy will help protect our health, nature and groundwater. However, the plans also help underpin the production of high quality food, contributing to developing new environmental technologies in

Denmark. By setting ambitious goals we are contributing to creating a domestic market for new technologies, methods and processes in the area of sustainable agriculture which are not merely vital for the state of Danish nature but which also hold export potential. Protection of nature and the environment goes hand in hand with promotion of growth and employment.

The need for focus on all areas

Of the pesticides sold in Denmark each year, farmers use 93 % to control weeds, diseases and insect infestations in their crops. Added to this is the use of pesticides in horticulture and forestry. The municipalities use pesticides to control invasive plant species such as giant hogweed. Beyond this, pesticides are used in private gardens, and to ensure good playing quality on golf courses. Therefore, to achieve sustainable use of pesticides, we need to focus on all areas.

Pesticides may help generate higher profits in agriculture, but the use of pesticides may also affect human health, nature and groundwater. Denmark is facing increasingly greater challenges in securing biological diversity, among other things, because pesticides affect hedgerows, watercourses and lakes in and around sprayed areas. There may be traces of pesticide residues in groundwater and in our food, and operators as well as bystanders may be exposed to risks when working with pesticides.

Cross-sectoral initiatives and areas of special interest
The new pesticides strategy includes two types of activities: Firstly a number of cross-sectoral initiatives, and secondly a number of initiatives linked to areas of special interest.

Cross-sectoral initiatives
There is a need for initiatives in the following cross-sectoral areas in particular:

- **Strict approval of pesticides**
  Methods and criteria to assess and approve pesticides must be developed and improved in order to allow for more rapid incorporation of new knowledge. A more harmonised practice must be developed for assessment by the Nordic countries and the Baltic countries of applications for approval of pesticides, and contributation to the European approval process must be intensified.

- **Strengthened initiatives to protect groundwater**
  The "Danish Pesticide Leaching Assessment Programme" (PLAP), and modelling of PLAP data will be strengthened, and the various authorities working on point sources must intensify coordination and ensure efficient cooperation.

- **Increased food safety**
  More initiatives for determining the lowest possible maximum residue levels for the individual pesticides in food and feed.

- **Strengthened control of pesticides**
  It must not pay to cheat. Accordingly, stricter penalties will be introduced for illegal imports and use of illegal pesticides as e.g. counterfeit pesticide products, and control of submitting spraying records and residue concentrations in food will be tightened.

- **Investment in research and technology**
  This includes e.g. subsidies for research into knowledge about the combination effects of pesticides, the risk of leaching of pesticides to groundwater and endocrine disruptive effects.

Areas of special interest
In addition to cross-sectoral initiatives, this strategy encompasses initiatives aimed at specific target groups:

- Agriculture, i.e. farmers, horticulturalists and their advisors
- Public areas, i.e. municipalities, regions and the governmental institutions
- Golf courses
- Owners of private gardens

The specific initiatives particularly involve better teaching and information for users and the public about the risks of using pesticides. This includes e.g. information for owners of private gardens and consumers, more information for municipalities on controlling invasive species without the use of pesticides, additional education of greenkeepers at golf courses, as well as instructing farmers and their advisors on how to minimise their use of pesticides, on how to choose the pesticides causing the lowest load as well as on integrated pest management.

KANSAS

The development in pesticide usage and pesticide loads

In recent years, the sale of pesticides has only gone one way: up! Since 2007, the pesticide loads on the environment and human health have increased by 35 %. This development must be stopped.

The most recent calculation of the treatment frequency index (TFI) shows an increase from 2.80 in 2010 to 3.18 in 2011, corresponding to an increase of 13 %. During the past five years, the TFI has increased by 27 % in total, whereas the total pesticide load on nature, the environment and human health rose by 35 % in the same period. Figure 1 shows the three-year average for TFI from 2000 to 2011.

The new indicator, the Pesticide Load Indicator PLI (and area load, AL) shows the same overall pattern as the TFI for the period 2007 to 2010. However, as shown in Figure 2, the TFI increased in 2011, whilst the load fell. This means that in the same year, the two indicators can move in different directions. If farmers choose to use pesticides causing lower loads, the load will drop, even if they continue to spray their fields just as often, or even spray more frequently to eliminate e.g. new pests.

Figure 2: Development in the Pesticide Load Indicator (PLI), the area load (AL) and the treatment frequency index (TFI) 2007-2011

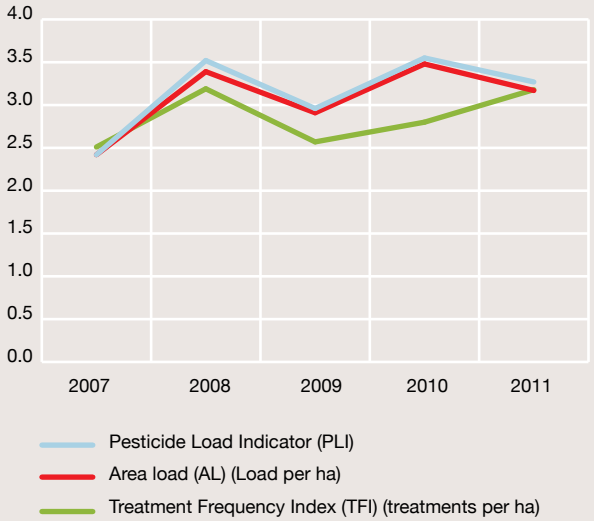


Figure 1: Development in the treatment frequency index 2000-2011

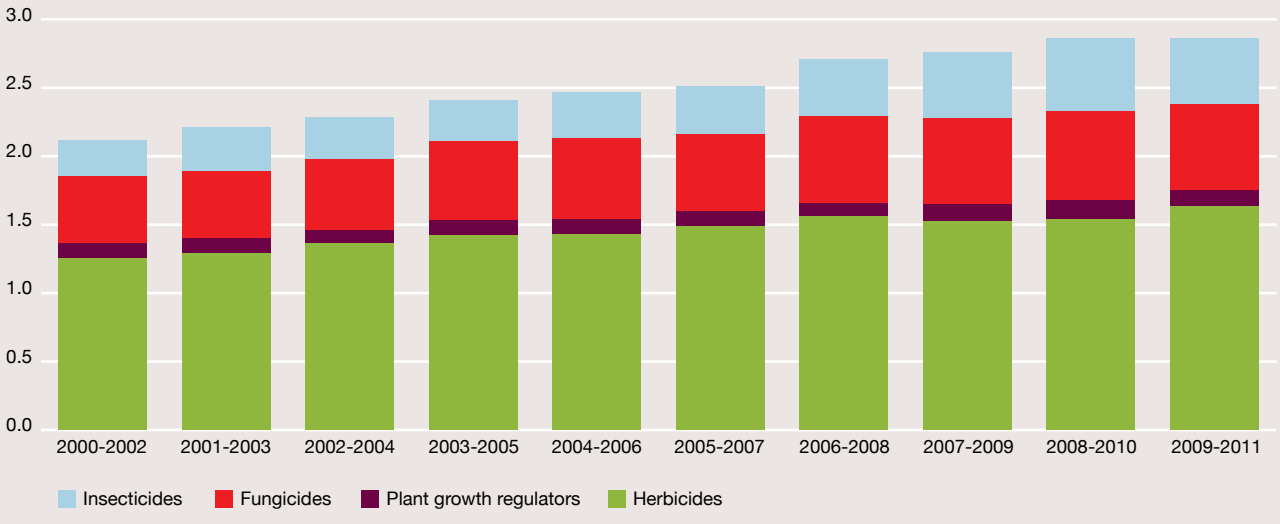


Figure 3 shows that if areas are divided according to load, and the area load (AL) is calculated according to the individual crops, the areas with the highest pesticide loads are areas where potatoes and vegetables are grown. In potato fields, the extensive area load is due to the use of herbicides with high loads, and because such areas are sprayed intensively with fungicides to combat potato blight. In relation to vegetables, the high area load is mainly due to the use of herbicides.

Cereal crops and seed rape have relatively low area load. This is because fields with such crops are treated with less pesticides or with pesticides causing lower loads. However, cereal crops contribute with the largest total pesticide load, because cereals cower a much larger area in Denmark than potatoes and vegetables.

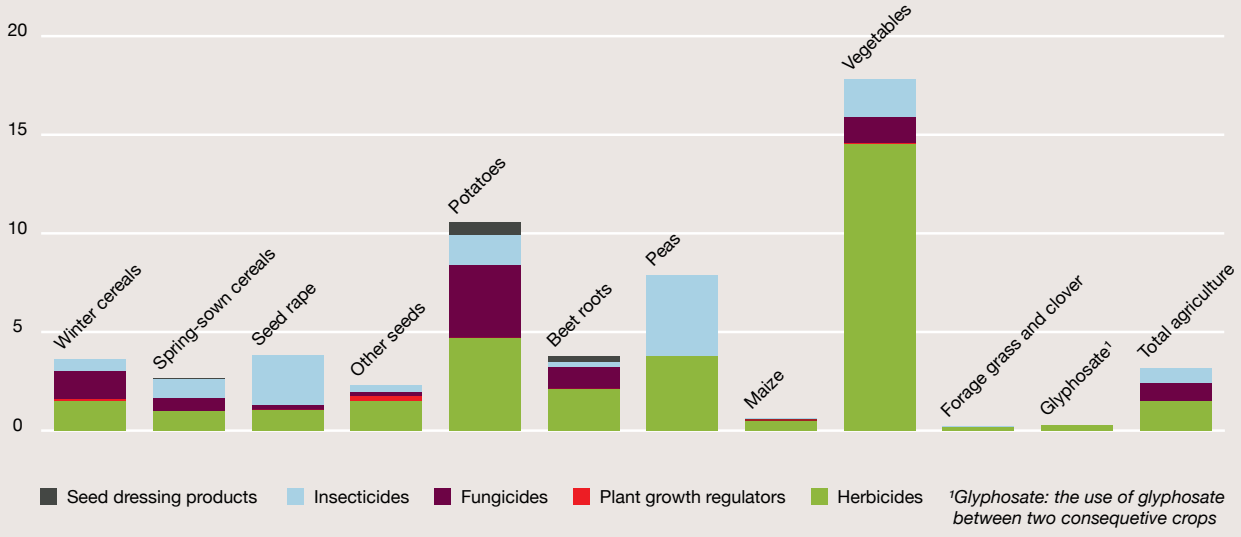
Connection between treatment frequency index, load and area load

For many years, the treatment frequency index (TFI) has been used as an indicator in Denmark. It shows how many times farmers spray their fields per annum on average. The TFI will also be calculated in the future, though exclusively as a supplement to the Pesticide Load Indicator (PLI). The Pesticide Load Indicator measures the load on human health, nature and groundwater. The pesticide loads are calculated for three main indicators:

- **Human health:** Provides a measure of the load to which the operator is exposed when handling and applying the pesticides.
- **Environmental behaviour:** Expresses how fast the pesticides degrades in soil, their risk of accumulation in food chains and the risk of leaching to groundwater.
- **Environmental toxicity:** Provides a measure of the toxicity of pesticides for animals and plants in the field (e.g. earthworms and bees) and the surrounding nature (e.g. fish and birds).

Area load (AL) shows the load per area unit.

Figure 3: Area load (AL) (Load per hectare)



¹Glyphosate: the use of glyphosate between two consequetive crops

2. Cross-sectoral initiatives

Strict approval of pesticides

The approval procedure for pesticides in Denmark must be efficient and strict to ensure expedient approval of new products and products causing lower loads and to keep pesticides, which pose a risk, out of the Danish market. Furthermore, it is vital that we play an active role in the EU.

Based on the most recent knowledge, Danes must be able to trust that the authorities only approve pesticides assessed not to pose a risk to human health, nature or groundwater. And they must be able to trust that their food does not contain harmful pesticide residues. People who use pesticides must be able to choose the pesticides causing the lowest load. And animals and plants must be ensured the best conditions possible. This calls for an intensive strategy encompassing new Danish initiatives as well as strengthened efforts at EU level.

The Danish Government wants to ensure fast approval of new pesticides and pesticides causing lower loads so that users gain access to the pesticides causing the lowest load as fast as possible. The authorities must also react as quickly as possible in the event of new information about the properties of pesticides.

Better general protection throughout the EU provides for a better competitive situation for Denmark. Therefore it is important to influence the European cooperation on pesticides as much as possible, whether in relation to assessment of active substances or in relation to general EU legislation and guidance. A special area of interest is development of criteria for endocrine disruptors and principles for assessment of combination effects.

What the Danish Government wants

- **More efficient and strict approval scheme**
  An effective and strict approval scheme has high priority. This is to ensure that delays in the evaluation process does not block approval of low-load alternatives to previously approved products. In future, substances of very high concern (classified as carcinogenic, mutagenic, toxic for reproduction, or which comply with the criteria for endocrine disruptors) must be approved only if they meet specific restrictive conditions.
  Effect: Increased protection of human health, nature and groundwater.

- **Special effort in the EU on low maximum residue levels for pesticide residues in food.**
  In the EU, Denmark has a special focus on setting the lowest posible maximum resudue levels for pesticides in food whilst ensuring that pesticides still remain efficient.
  Effect: Reduced load on consumers' health.

- **Increased focus on combination effects in relation to pesticide residues in food.**
  An assessment will be carried out of the risk of any combination effects from consumer exposure to multiple pesticides at the same time. The results will be used in EU negotiations on setting maximum residue levels for pesticides in food.
  Effect: Reduced load on consumers' health.

- **Increased focus on pesticide residues in feed crops**
  Denmark wants to work on incorporating feed crops in the crop annex to EU regulations on pesticide residues to enable setting of maximum residue levels for pesticide residues in feed crops.
  Effect: Reduction in health risks for animals and humans.

- **Subsidy scheme for alternative pesticides**
  The subsidy scheme for promoting alternative pesticides is intended to increase the supply of alternative low-risk pesticides with a better health and environmental profile than traditional synthetic pesticides.
  Effect: Reduced load on human health, nature and groundwater, as well as incentive for conversion to organic farming.

Other initiatives

During the strategy period, the authorities want to examine the possibility of introducing statutory requirements on the use of drift-reducing nozzles, and communication initiatives targeted at citizens have high priority. Furthermore, Denmark's influence on approval work in the EU and the Northern zone (the Nordic countries and Baltic countries) will be given higher priority.

Strengthened initiatives to protect groundwater

We must ensure that we keep the worlds' best and cleanest groundwater now, in ten years and in the longer term. This requires that we take precautionary measures to protect groundwater and act resolutely if there is reason to suspect contamination with pesticides above the threshold value.

The Danish pesticide strategy increases protection of human health, nature and drinking water by e.g. streamlining and strengthening our approval scheme, enhancing the collection of knowledge, controlling, regulating and not least through communicating to citizens.

The Danish approval scheme will be strengthened. The authorities must react faster in the event of findings pesticides above the threshold value in the groundwater via Pesticide Leaching Assessment Programme. If there is a need to change the approvals, such changes must take effect as quickly as possible. Moreover, we will continue to take precautionary measures towards protection of groundwater. We must increase our knowledge about substances in groundwater and interpret data critically.

The municipalities must to a greater extent establish more protection areas near wells, and similarly, municipal action plans on protecting surface water and groundwater will ensure targeted protection of groundwater in highly sensitive areas. In addition, the municipalities will receive advice on protection of ground water, among other things focusing on the establishment of protection areas near wells.

The aim is for Denmark to continue having stricter approval requirements than the EU. We must ensure the best possible protection of groundwater based on our special geological conditions and ensure that, in the future, we can continue using untreated groundwater for our drinking water.

What the Danish Government wants

- **International assessment of the approval scheme**
  In order to ensure the best possible protection of groundwater in Denmark, the Danish Government is launching an international review of the current approval practices. This review aims at recommending how to perform assessments of pesticides and provide ideas for further initiatives on preventing pesticide leaching to groundwater.
  Effect: Better protection of the groundwater.

- **More knowledge about pesticides in groundwater**
  The Danish Pesticide Leaching Assessment Programme will be strengthened by ensuring that more samples are taken and analysed for more substances. Modelling will improve utilisation of data and the results will be assessed more quickly. If the leaching assessment programme shows a possible risk for specific pesticides, the use of them will be prohibited and authorities will aim at making agreements with agriculture and the chemicals industry on fast termination of the use and/or withdrawal of the relevant pesticides from the market in order to obtain a faster effect with the least inconvenience to the industries.
  Effect: Faster implementation of restrictions to ensure better protection of the groundwater.

- **Strengthened cooperation between authorities, enterprises and organisations**
  In order to reduce pollution of groundwater from already banned substances and from point sources, cooperation between authorities will be intensified. This will be done by describing the various options for identifying and managing point sources. Knowledge must be shared between the authorities, organisations, the water enterprises a.o.
  Effect: Fewer prohibited pesticides in groundwater and less point source pollution with approved substances.

- **Strengthened efforts in the EU and Northern zone**
  Denmark's influence on approval work in the EU and in the Northern zone (the Nordic countries and the Baltic countries) shall be given higher priority to ensure the best possible common protection of groundwater and more equal production conditions for agriculture, fruit growing and horticulture.
  Effect: Better protection throughout the EU and more equal competitive conditions.

- **Targeted communication to citizens**
  Citizens must be able to trust that tap water does not contain pesticide residues which may pose a risk. Therefore, we will ensure a more active communication about groundwater protection in general and on restrictions and bans on sale and use of pesticides.
  Effect: More knowledge about groundwater protection and greater sense of confidence in the population.

Increased food safety

We must ensure that Danish food does not contain harmful pesticide residues. And we must ensure that Danes feel safe and well-informed when they choose their food. This requires both strengthened control by the authorities and more information campaigns.

Danes must be able to easily select food without harmful pesticide residues. Therefore the Danish Government is enhancing initiatives in two areas:

First the Danish Government wants to strengthen control of pesticide residues in food and feed. Control is to ensure that maximum residue levels are not exceeded as well as to monitor the intake by the population of pesticide residues through food. The Danish Government also wants to test food and feed for more pesticides than today. Furthermore, the analysis time must be reduced to ensure better possibilities of intervening in the event of maximum residue levels being exceeded, and to stop non-compliant food before it is sold and eaten.

Second the Danish Government will increase the information initiatives on pesticides, the use in food production and the presence of residues in food. This will mean that the consumer demands will create an incentive for farmers to cultivate and sell products grown without pesticides or with less quantities of pesticides.

What the Danish Government wants

- **Expansion of the control programme to include feed crops**
  The control of feed crops must be included in a common analysis programme for food and feed. Maximum residue levels are expected to be set for feed crops in EU regulations on pesticide residues so that all feed crops become subject to the same restrictions as in the food area.
  Effect: Increased food safety.

- **Test of more substances and shorter analysis time**
  In order to control the pesticides used in Denmark and the EU and/or found in imported crops, there is a need to improve and further develop analysis methods to cover all relevant food and all relevant pesticide substances.
  Effect: Improved control and increased knowledge about pesticide residues in food and feed on the Danish market.

- **Increased control to ensure safe feed and food at enterprises**
  Increased focus on control of documentation on importers and feed and food enterprises.
  Effect: Extended quality assurance in relation to risk assessment, product quality and enhanced control on suppliers.

- **Focus on special problem crops or places of origin.**
  Parts of the control will focus on samples where the authorities expect the risk of non-compliance to be highest or on areas of special needs for knowlege on pesticide residues. This may be samples of specific crops or samples from specific producers or countries.
  Effect: Increased food safety.

- **Targeted information to consumers**
  Information initiatives to provide background information about e.g. pesticide residues, maximum residue levels and control. Furthermore this information will include tools for the consumer to choose food with as few pesticide residues as possible.
  Effect: Enable consumers to make a more conscious choice of food on an informed basis.

Other initiatives

Results of the official control on pesticide residues in food will be published quarterly and collated each year in a major report. Furthermore, the Danish Veterinary and Food Administration will publish a report in 2013 with the results of its monitoring of the population intake of pesticide residues in food in the period 2004-2011.

Strengthened control with pesticides

New regulations must ensure that we use fewer pesticides and pesticides causing lower loads in Denmark. However, the regulations will only have the desired effect if they are respected. Therefore there will be tighter control.

Illegal import of pesticides is a growing issue in Denmark, and many of the illegally imported products may pose a risk to groundwater. This is unacceptable, and we must take all steps necessary to stop illegal imports. The Danish Government will therefore increase efforts to strengthen the control of illegal imports and will also be strengthening penalties for importing and using illegal products. Additionally, the authorities will continue their control of retailers and farmers.

The authorities must intervene in situations and areas with special risks that the use of pesticides may pollute the groundwater. This can be done by e.g. prioritising targeted control of the use of pesticides around water wells. Another means of intervention is to increase the control of washing and filling sites which may pose a potential risk of point source contamination.

What the Danish Government wants

- **Increased efforts to combat illegal imports of pesticides**
  A cross-disciplinary Taskforce with representatives from several ministries is to closely monitor the development in illegal imports and react with new initiatives if necessary.
  Effect: Less illegal imports of pesticides and thus increased protection of human health, nature and groundwater.

- **Increased control of submissions of spraying records**
  The information in the reports from spraying records must be used targetedly in work on preventing illegal imports. The spraying record act has been changed to enable the authorities to exchange information from the different registers.
  Effect: Less illegal imports and use of pesticides.

- **Tightened penalties for importing and using illegal products**
  Today there are cross-compliance requirements regarding illegal use of pesticides which mean that farmers who violate the regulations will have their EU subsidy considerably reduced. An examination will be carried out to see whether it is possible to introduce similar requirements for possession of illegal pesticides and if so, such requirements will be introduced. Regulations will be introduced to ensure that farmers who import, own and/or use illegal pesticides may have their spraying certificate revoked. Until now, fines have generally been too low and not sufficiently preventive. This will be changed. Higher penalties will be introduced in the Chemical Substances and Products Act with a view to removing the incentive to import and use illegal pesticides.
  Effect: Less illegal imports of pesticides and thus increased protection of human health, nature and groundwater.

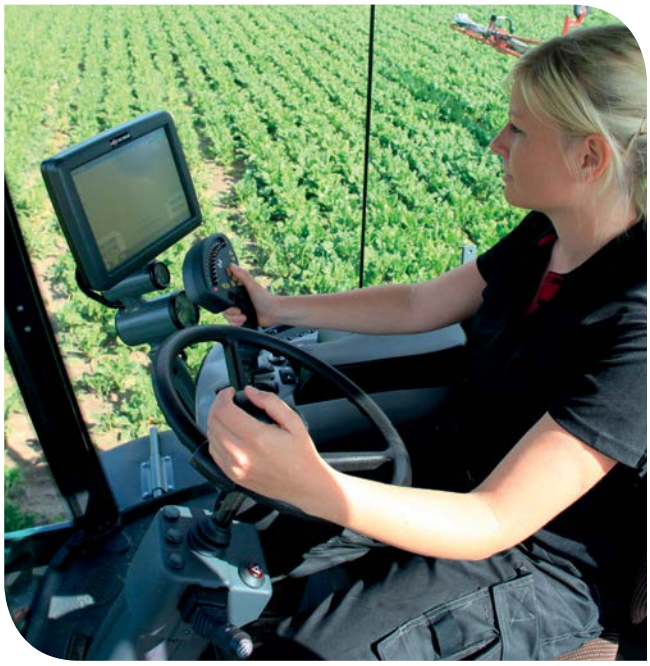
- **Inspection of spray application equipment requires training and control**
  In future, all spray equipment must be inspected, but the regulations will only have the desired effect if they are understood by those affected by them. Therefore, the Danish Government will ensure education and training for the people who are to inspect the sprayers, and will establish the framework for inspection to be carried out smoothly. At the same time, the Government will tighten control of the sprayers in use, so that no one will be able to bypass the rules about inspection.
  Effect: Protection of human health, nature and groundwater.

- **Strengthened control**
  In future, several authorities will tighten control; separately and in close collaboration. The Danish AgriFish Agency will make more targeted inspection visits each year to selected agricultural enterprises and, among other things, check that farmers keep and use pesticides correctly, and that they report their spraying-record data. Among other things, the Danish EPA will monitor that users in public areas have a spraying certificate and it will monitor the content of the pesticides sold in Denmark. The Central Customs and Tax Administration will carry out random checks of enterprises' tax returns, and check that the pesticides imported to Denmark have been approved by the Danish EPA.
  Effect: Increased compliance with the regulations, and increased protection of human health, nature and groundwater.

Investment in research and technology

We must ensure that in Denmark we have the necessary knowledge to be able to minimise risks and loads when using pesticides. We must ensure that Denmark gains more influence in the EU and in the zonal collaboration. This requires continued funding for research, development and eco-technology.

The Danish Government wants an ambitious and strategic approach to the funding which is currently being granted from the Pesticide Research Programme, the Green Development and Demonstration Programme (GUDP) and the eco-technology scheme also including European co-operation on new knowledge. It is very much about utilising green solutions and research to the benefit of human health, nature and groundwater. For instance, with new technology the farmer can save up to 40 % of his use of pesticides.



The Danish EPA's Pesticide Research Programme is focusing on basic research on pesticides. The Green Development and Demonstration Programme (GUDP) provides funding for business-oriented projects, which can increase the sustainability of the food industry, and the eco-technology scheme provides investment funding for new technology that reduces discharges or the use of, for example, pesticides in agriculture.

What the Danish Government wants

Targeted funding for pesticide research

Funding for projects which increase our knowledge about pesticide impacts (including combination effects, endocrine disruptive effects as well as the risk to groundwater and the aquatic environment) and projects which help develop methods to reduce the pesticide load and increase protection of human health, nature and groundwater. For example, research into tools to implement principles on integrated pest management and to measure the effects of these efforts.

Effect: New knowledge which can help increase protection of human health, nature and groundwater.

Improved monitoring, warning and decision supporting systems for pests

Existing monitoring, warning and decision supporting systems will be developed further, and perhaps new systems will need to be developed. Among other things, it is necessary to develop systems that include environmental factors in the decision basis, for example by suggesting the pesticides causing the lowest load and by calculating the economic gain resulting from their use.

Effect: Optimised use of pesticides to obtain a reduction in the use and pesticide load on human health, nature and groundwater.

Funding for green innovation

In 2012, the eco-technology scheme had special focus on pesticides with a commitment framework of DKK 73 million. The funding will take effect from 2013 and 2014 and is expected to contribute positively to the green transition in the pesticide area, including implementation of IPM. Again in 2013, funds will be allocated to the pesticide area under the eco-technology scheme. The GUDP will continue to focus on the pesticide area as one of the priority issues for the programme.

Effect: Reduced use of pesticides and thereby reduced pesticide load as well as contribution to green transition.

3. Areas of special interest

Focus on integrated pest management

Farmers and other growers that use pesticides must choose the cultivation solution resulting in the lowest load on human health and the environment. This requires the IPM principles to be well integrated into the work of farmers, etc.

The EU requires all farmers and other professional users of pesticides to comply with the principles for integrated pest management (the IPM principles) from 2014. In short, integrated pest management means that farmers must do whatever possible to prevent attacks of pests and thereby reduce the need for pesticides.

The new pesticide tax promotes the use of pesticides resulting in the lowest load on human health, nature and groundwater. The pesticides causing the highest load will also be the most expensive, and this will encourage farmers and other growers to comply with the IPM principles, to use less pesticides and to use the pesticides causing the lowest load.

As a supplement to the tax, the Danish Government wants to enhance educational initiatives on IPM. For example, with time, the advisory processes already in progress will be replaced by better training of all farmers in order to communicate the most recent knowledge on integrated pest management to everyone. Increased implementation of IPM will also strengthen our possibilities to influence the EU agenda and thereby ensure a general high level of protection.

The EU framework directive on sustainable use of pesticides contains an annex with eight principles for Integrated Pest Management (IPM). Following the eight principles will help prevent the occurrence of weeds and pests and reduce the need for spraying considerably. The eight IPM principles are described on page 30.

What the Danish Government wants

- **Targeted IPM advisory services in agriculture**
  Targeted advisory processes will be carried out for large professional farms in two-year programmes, in 2012-2013 and again in 2014-2015. Up to and including 2015, the most recent knowledge within IPM will be tested on special IPM demonstration farms. This knowledge will be conveyed to the entire agricultural industry.
  Effect: Reduction in the use of pesticides and reduced load.

- **Targeted IPM advisory services in horticulture**
  Targeted advisory processes for professional growers in two-year programmes in the period 2012-2013 and again in 2014-2015. Focus is particularly on pesticide residues in fruit and vegetables and on health and safety at work in greenhouse production. The most recent knowledge will be tested on demonstration nurseries, which are to make special efforts to test the IPM principles. The most recent knowledge will be conveyed to the entire horticulture industry.
  Effect: Reduction in the use of pesticides and reduced load.

- **Advisory services on minimising pesticide residues in food.**
  Particularly within horticulture, advisory services must focus on ensuring the lowest possible level of pesticide residues in crops, for instance by disseminating knowledge about using alternative treatment strategies.
  Effect: Fewer pesticide residues in food.

- **Update of cultivation guidelines**
  Crop-specific cultivation guidelines for agriculture/nursuries will be updated with the IPM tools considered to be realistic to implement with current knowledge and framework conditions for agriculture.
  Effect: Reduction in the use of pesticides and reduced pesticide load.

- **Increased focus on IPM in the education and training of farmers and advisors**
  Knowledge about IPM must be part of the curriculum in the pesticide application certificate training programme, and agricultural advisers and other advisers will be offered courses on IPM.
  Effect: Reduction in the use of pesticides and reduced load.

Reduced pesticide usage in areas under public government

Municipalities, regions and governmental institutions must move closer to the goal of phasing out pesticides in public areas. Particular focus must be on phasing out pesticides in parks, in sports areas and in other public areas. This requires pest control strategies to be updated with the most recent knowledge and experience in the area, as well as both good and bad experiences to be shared.

In 2007 governmental institutions, regions and municipalities renewed an agreement from 1998 to phase out the use of pesticides in public areas. Since the first agreement was concluded, there has been a significant decrease in the use of pesticides in public areas, with a reduction in the use from 1995 to 2010 from 23 tonnes to three tonnes. However, municipalities in particular, which are obligated to control invasive plant species in Natura 2000 areas, have pointed out challenges in controlling invasive plant species such as dog rose and Japanese knotweed without the use of pesticides.

The Danish Government will therefore ensure that municipalities, regions and governmental institutions maintain focus on reducing the use of pesticides and, as far as possible, choose strategies without pesticides to control invasive plant species. Furthermore, particular focus must be on phasing out pesticides in parks, in sports areas and other public areas.

What the Danish Government wants

- **Pest control strategies for invasive plant species**
  Strategies are being developed with advice on controlling a number of invasive plant species. Pest control strategies must be updated regularly with the most recent knowledge in the area and on the basis of the best experience gained by municipalities, regions and governmental institutions.
  Effect: Efficient control of invasive plant species and maintaining low use of pesticides.

- **Increased knowledge sharing between municipalities and governmental institutions**
  Collaboratively with Local Government Denmark, a forum will be established for municipalities and governmental institutions to exchange experience on managing public areas without pesticides. Special efforts will be made to share experience with municipalities that find it difficult to comply with the voluntary agreement. Knowledge sharing and communication of research results have also been given high priority.
  Effect: Maintaining a low use of pesticides.

- **Survey of the use of pesticides**
  In 2014, data on the use of pesticides in public areas during 2013 will be collected and published.
  Effect: Exchange of information and overview of developments.

Strict demands in golf courses

Golf clubs must meet more strict demands for the use of pesticides on golf courses to reduce use and load. This requires increased control and dialogue.

About two tonnes of pesticides are used annually on golf courses. Therefore, it is necessary to ensure that only the amounts needed are used and nothing more, and that the clubs comply with the IPM principles. Inspections have revealed that, to a certain extent, golf courses use pesticides which either have not been approved for golf courses or which are banned in Denmark.

The Danish Government wants to increase protection of the groundwater and nature, and at the same time continue to enable golf clubs to maintain high-quality courses. Compliance with the new regulations is also important, and using illegal pesticides, for example, will have substantial consequences for golf clubs.

The Danish Government has therefore introduced a cap for how much golf clubs can load the individual golf course with pesticides. The new regulations are about limiting the use of pesticides as far as possible. Not only in terms of amounts used but also in terms of toxicity. This is to be done on the basis of a points system based on the properties with respect to human health and the environment of the individual pesticides. In future, golf clubs will also have to report their annual use of pesticides to the Danish Environmental Protection Agency (EPA), and the Agency will monitor compliance with the new regulations.

The requirements will be supplemented by initiatives to increase knowledge and change attitudes in the sector. The greatest barriers are assessed to be the golf clubs' focus on financial aspects and play quality as well as the lack of support for pesticides reduction. This is why a change of attitude is required in the golf sector.

What the Danish Government wants

- **Enhanced continuing training of greenkeepers**
  Greenkeepers' level of knowledge must be increased through continuing training courses. The training courses must focus on alternative pest control strategies, management of golf courses without pesticides, tailored dosages as well as calibration and maintenance of spaying equipment.
  Effect: Reduced pesticide use and pesticide load.

- **New internet portal for reporting pesticide use**
  A reporting portal will be established for the individual golf clubs to report their use of pesticides. This will enable monitoring of the use of pesticides, calculation of the pesticide loads on the individual golf courses and course elements, and monitoring of compliance with regulations.
  Effect: Reduced pesticide use and pesticide load.

- **Continuation of inspection campaigns on golf courses**
  As long as there continues to be violations, the Danish EPA Chemical Inspection Service will carry out inspection campaigns on golf courses. The purpose is to check whether pesticides not approved in Denmark are being used, and whether pesticides not approved for golf courses are being used. Moreover, control will be carried out on pesticide usage in the new reporting portal.
  Effect: Reduced pesticide use and pesticide load.

- **Evaluation of the new regulations**
  Regulations on the maximum pesticide load on golf courses will be evaluated after the first year and, thereafter, at least once every three years. It will be assessed whether the selection of approved, low-load pesticides for golf courses has increased, and whether it is possible to tighten regulations further.
  Effect: Reduced pesticide use and pesticide load.

Reduced pesticide load in private gardens

Owners of private gardens must be better equipped to manage their gardens without pesticides, and if they spray, they must use the pesticides that result in the lowest load on human health, nature and groundwater. Furthermore the public must have more knowledge about the risks of pesticides. This requires more information, new regulations for distributors and new ways to collaborate.

Owners of private gardens use pesticides to control moss in their lawns, ground elder and other stubborn weeds. Their total annual use in Denmark is 60-120 tonnes, corresponding to about 2 % of total sales of pesticides in Denmark.

The Danish Government wants the general public to have access to updated knowledge about risks in using the individual pesticides, and it wants to encourage owners of private gardens either to stop using pesticides completely or to choose the products that result in the lowest load on human health, nature and groundwater. Distributors must also be better equipped to advise customers, and pesticides can only be purchased via direct contact with a sales person.

What the Danish Government wants

- **Information campaign on choice of pesticides etc.**
  An information campaign is to provide owners of private gardens with tools to choose the pesticides causing the lowest load and to use these safely. The campaign is also aimed at increasing owners of private gardens' knowledge about alternatives to pesticides.
  Effect: Increased protection of human health, nature and groundwater.

- **Information campaign on illegal imports of pesticides**
  An information campaign will be carried out to make owners of private gardens aware that only pesticides approved by the Danish EPA are allowed.
  Effect: Increased protection of human health, nature and groundwater.

- **More restricted access to purchasing pesticides**
  Criteria will be laid down to decide which pesticides can be purchased and used by persons without a spraying certificate, i.e. by owners of private gardens. The criteria will ensure that only the pesticides causing the lowest load can be purchased by owners of private gardens.
  Effect: Increased protection of human health, nature and groundwater.

- **New terms for selling pesticides to owners of private gardens**
  Regulations will be introduced demanding training of sales persons and in the future they must acquire a certificate in order to be able to sell pesticides. A plan will be drawn up to ensure that all relevant distributors can complete the course before the end of 2015. Requirements that sales of pesticides to owners of private gardens must be through direct contact with a sales person, who holds the certificate, will also be introduced. This means that in future, the majority of the pesticides will either have to be kept behind the counter, in the storage or in locked cabinets/rooms in the shop.
  Effect: Increased protection of human health, nature and groundwater.

- **Annual statistics of sales to owners of private gardens**
  Annual sales statistics will be produced to provide knowledge about which pesticides private garden owners buy.
  Effect: Better knowledge to more targeted information.

4. Annex

How we reach our goals – safe management

The objective to reduce the pesticide load by 40 % must be fulfilled by the end of 2015. As this is a three-year strategy, and it should be possible to plan the subsequent pesticides strategy, a mid term evaluation will be carried out of all the initiatives in the strategy after the end of 2014.

Organisation to support progress and achievement of goals

An overall steering group will be set up across different ministries, in order to help ensure coordination of the many varied initiatives. Furthermore the steering group is to ensure that the responsibilities for implementing all initiatives are assigned and monitored regularly by the relevant parties. The group will also ensure regular status making regarding whether the initiatives are contributing to achieving the overall objective of the strategy. Moreover, the steering group will be responsible for reporting an annual status to ministers and the Danish Parliament. This status will contain information regarding the development of the treatment frequency index and the pesticide load (especially the load with respect to the groundwater) on an annual basis. The report will also include status regarding the development of resistance to pesticides in pests and the crop selection, in order to evaluate whether the tax will lead to cessation of the growing of certain crops in Denmark.

The steering group will meet twice a year and will consist of representatives from the following authorities:

- The Department at the Danish Ministry of the Environment
- The Danish Environmental Protection Agency
- The Danish Nature Agency
- The Department at the Ministry of Food, Agriculture and Fisheries of Denmark
- The Danish Veterinary and Food Administration
- The Danish AgriFish Agency
- The Danish Ministry of Taxation

Under the overall steering group, a number of technical steering groups and accompanying groups with participation of relevant stake holders will be set up.

How to follow the IPM principles

1. The prevention and control of pests should be by several methods, especially by:
   - having a varied and healthy crop rotation
   - using adequate cultivation techniques
   - using, where appropriate, resistant or tolerant crop types and using seed material of high quality
   - using appropriate fertilisation, liming, watering and drainage methods
   - preventing the spreading of weed, diseases and pests
   - protection and enhancement of important beneficial organisms inside and around the area cultivated.
2. Pests in crops should be monitored by adequate methods and tools and by using warning, forecasting and diagnosis systems, where feasible, as well as by seeking advice from professionally qualified advisors.
3. Warnings, forecasts and threshold values should be included in decisions on plant protection.
4. Biological, physical and other non-chemical methods to control pests should be chosen, if they provide satisfactory pest control.
5. Pesticides should be applied which are most suitable for the task and result in the lowest load on human health, non-target organisms and the environment.
6. The correct dosage should be used; as far as possible reduced doses. Treat with reduced application frequency or partial application should be preferred thereby preventing pest from developing resistance to pesticides.
7. Where there is a risk of development of resistance, anti-resistance strategies should be applied to maintain the effectiveness of the products. For example by using multiple pesticides with different modes of action.
8. Check the success of the measures applied. The starting point is regular monitoring of pests in the field and registrations in spraying records.

Initiative and impact overview

A number of benchmarks have been laid down as a supplement to the overall objective to achieve a 40 % reduction in pesticide loads on human health, nature and groundwater by the end of 2015. The benchmarks indicate what the Danish Government wishes to accomplish in the various areas. The initiative and impact overview shows the initiatives being implemented to reach the individual benchmarks, and how, through this, we are contributing to reducing the pesticide load on nature, groundwater and human health. The initiatives will be implemented at different times, which also are illustrated in the overview.

Objective	Initiatives	Effect	2013	2014	2015
Load of pesticides on human health, nature and groundwater must be reduced by 40 % by the end of 2015.	Pesticide tax.	Reduction in the load on human health, nature and groundwater.	x	x	x
	Annual statistics to monitor sales, use and load.	Enables monitoring of developments.	x	x	x
	Annual status to contracting parties.	Enables adjustment of efforts.	x	x	x
	Evaluation after 2014.	Knowledge for next period.			x
Approval and control					
Benchmarks	**Initiatives**	**Effect**			
Health loads from using substances of very high concern (carcinogenic substances and endocrine disruptors) must be reduced by 40 % by the end of 2015 compared with the load in 2011.	More efficient and strict approval scheme.	Increased protection of human health, nature and groundwater.	x	x	x
	Subsidy scheme for alternative pesticides.	Reduced load on human health, nature and groundwater, as well as increased incentives for converting to organic farming.	x	x	x
	Increased efforts in relation to EU risk assessments.	Increased protection throughout the European Union.	x	x	x
	Research efforts to expand knowledge and develop methods for use in the approval system.	Increased protection of human health, nature and groundwater.	x	x	x
	Increased use of information from spraying records for controlling legal use of pesticides in agriculture.	Minimisation of illegal imports and use of pesticides.	x	x	x
	Increased efforts against illegal imports of pesticides.	Reduced illegal imports of pesticides and thereby increased protection of human health, nature and groundwater.	x	x	x
	Tightened penalties for illegal imports and use of pesticides.	Reduced illegal imports of pesticides and thereby increased protection of human health, nature and groundwater.	x	x	x
	Training/education and control to support new requirements for inspection of sprayers.	Protection of human health, nature and groundwater.	x	x	x
	Strengthened control.	Increased compliance with regulations and increased protection of human health, nature and groundwater.	x	x	x
	Communication targeted at the public on agricultural use of pesticides, on safe use and on risks related to their use.	Greater knowledge and safety for the population.	x	x	x

Groundwater					
Benchmarks	**Initiatives**	**Effect**	**2013**	**2014**	**2015**
No transgression of pesticides threshold values in the groundwater.	International review of the approval scheme.	Better protection of groundwater.	x	x	
	More knowledge about risks of pesticides leaching to the groundwater.	Faster implementation of restrictions to ensure better protection of groundwater.		x	x
	Strengthened collaboration between authorities, enterprises and organisations to manage point-source pollution.	Fewer prohibited pesticides in groundwater and less point-source pollution with approved substances.	x	x	
	Strengthened efforts in the EU and North zone.	Better protection throughout the EU and more equal competitive conditions.	x	x	x
	Targeted communication to citizens about groundwater protection and about the restrictive approval scheme for pesticides.	More knowledge about groundwater protection and greater confidence for the population.	x	x	x
	Research efforts in the groundwater area.	Increased protection of human health, nature and groundwater.	x	x	x
Food					
Benchmarks	**Initiatives**	**Effect**			
The content of pesticide residues in Danish food must be as low as possible.	Special effort in the EU on low maximum residue levels for pesticide residues in food.	Reduced load on consumer health.	x	x	x
	Increased focus on examining the risk of combination effects in relation to residues in food.	Reduced load on consumer health.	x	x	x
	Increased efforts to examine the occurrence and the risk of pesticide residues in feed crops.	Reduction in health loads for livestock and human beings.	x	x	x
	Expansion of the control programme to include residues in feed crops.	Increased food safety.	x	x	x
	Testing of more substances and shortening analysis times.	Improved control and increased knowledge about residues in food.	x	x	x
	Increased control to ensure safe feed and safe food at enterprises.	Extended quality assurance in relation to risk assessment, product quality and enhanced supplier assessment.	x	x	x
	Focus on special problem crops or places of origin.	Increased food safety.	x	x	x
	Targeted information to consumers about the use of pesticides and the occurrence of residues in food and consumers' possibilities to influence the sector through their buying habits.	Enable consumers to make a more conscious choice of food on an informed basis.	x	x	x
	Publication of annual inspection results of pesticide residues in food.	Enable consumers to make a more conscious choice of food on an informed basis.	x	x	x
	Report with monitoring results.	Enable consumers to make a more conscious choice of food on an informed basis.	x		

Use and cultivation					
Benchmark	**Initiatives**	**Effect**	**2013**	**2014**	**2015**
All farms must be cultivated according to the principles on IPM before 2014.	Targeted IPM advisory services in agriculture.	Reduction in the use of pesticides and reduced loads.	x	x	x
	Targeted IPM advisory services in horticulture.	Reduction in the use of pesticides and reduced loads.	x	x	x
	IPM demonstration farms are testing the most recent knowledge, which will be communicated to the entire sector.	Reduction in the use of pesticides and reduced loads.	x	x	x
	Update of crop-specific cultivation guidelines.	Reduction in the use of pesticides and reduced loads.			x
	Increased focus on IPM in the education and training of farmers and advisers.	Reduction in the use of pesticides and reduced loads.	x	x	x
	Advisory services on minimising pesticide residues in food.	Fewer pesticide residues in food.	x	x	x
	Development of monitoring, warning and decision supporting systems for pests.	Optimised use of pesticides to obtain a reduction in the use and loads on human health, nature and groundwater.			x
	Research efforts to identify barriers at users of pesticides and to increase knowledge about IPM.	Increased protection of human health, nature and groundwater.	x	x	x
	The eco-technology scheme provides special funding for new and improved technological solutions to minimise pesticide loads.	Reduced use of pesticides, thereby reducing loads and contributing to green transition.	x	x	x
Municipalities, regions and governmental institutions must reduce their use of pesticides in accordance with the voluntary agreement on this area.	Pest control strategies for invasive plant species.	Efficient control of invasive plant species and reduced use of pesticides.	x	x	
	Increased communication and knowledge sharing between municipalities and governmental institutions about spray-free management.	Maintaining a low use of pesticides.	x	x	x
	Calculation of the use of pesticides in public areas.	Exchange of information and overview of developments.		x	
The golf industry must reduce their use of pesticides and their pesticide load.	Strengthened continuing training of greenkeepers on alternative control and management strategies, and on IPM.	Reduced pesticide use and pesticide load.	x	x	x
	New internet portal for reporting pesticide consumption.	Reduced pesticide use and pesticide load.	x		
	Continuation of inspection campaigns on golf courses, as long as there are violations.	Reduced pesticide use and pesticide load.	x		
	Evaluation of the new regulations	Reduced pesticide use and pesticide load.		x	
	Research effort on golf courses.	Reduced pesticide use and pesticide load.	x	x	x
To a much greater extent owners of private gardens must select the pesticides causing the lowest load.	Information regarding the pesticides with the lowest load every year. A campaign targeted at owners of private gardens in 2015.	Increased protection of human health, nature and groundwater.	x	x	x
	Information campaign about illegal imports of pesticides for owners of private gardens.	Increased protection of human health, nature and groundwater.		x	
	New terms for selling pesticides to owners of private gardens.	Increased protection of human health, nature and groundwater.	x		
	Restricted access to purchase pesticides.	Improved protection of human health, nature and groundwater.	x		
	Annual statistics of sales to owners of private gardens.	Better knowledge for more targeted information.	x	x	x

Financing

The pesticides strategy is primarily financed by the revenues from the new tax on pesticides. In addition, processing of applications for approval of pesticides will be financed through fees and finally through reallocation of resources between the Ministry of Food, Agriculture and Fisheries and the Ministry of the Environment. Total financing for the three-year period is DKK 253.5 million, the annual financing is therefore DKK 84.5 million on average. Table 1 shows the amounts earmarked for the individual areas in the pesticides strategy.

Table 1. Financing of the individual areas of special interest in the three-year period.

Areas of special interest	Total	2013	2014	2015
Enhanced efforts for protection of the groundwater.	DKK 30.3 mill.	DKK 8.9 mill.	DKK 10.8 mill.	DKK 10.6 mill.
Increased control of e.g. illegal imports and increased food safety.	DKK 35.7 mill.	DKK 10.5 mill.	DKK 12.9 mill.	DKK 12.3 mill.
Stricter approval scheme and increased Danish efforts in the EU.	DKK 87.8 mill.	DKK 27.8 mill.	DKK 29.5 mill.	DKK 30.5 mill.
Other instruments, including research, advisory services and information.	DKK 99.7 mill.	DKK 32.4 mill.	DKK 32.2 mill.	DKK 35.1 mill.
Total	**DKK 253.5 mill.**	**DKK 79.6 mill.**	**DKK 85.4 mill.**	**DKK 88.5 mill.**
	Euro 33.8 mill.	**Euro 10.6 mill.**	**Euro 11.4 mill.**	**Euro 11.8 mill.**

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