

**MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
OF THE SLOVAK REPUBLIC**

**NATIONAL ACTION PLAN TO ACHIEVE
THE SUSTAINABLE USE OF PESTICIDES**

November 2012

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1. Introduction

Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (hereinafter 'Directive 2009/128/EC') entered into effect on 24 November 2009. Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (hereinafter 'Regulation (EC) 1107/2009'), applicable as of 14 June 2011, entered into force on the same day.

The aim of drawing up Directive 2009/128/EC was for Member States of the European Union to address the protection of human health and the environment and to ensure the sustainable use of pesticides, which entails formulating and implementing actions to reduce the risks and potential negative impacts of pesticide use on human health and the environment.

Article 4 of Directive 2009/128/EC provides that Member States shall adopt National Action Plans to set up their quantitative objectives, targets, measures and timetables to reduce risks and impacts of pesticide use on human health and the environment and to encourage the development and introduction of integrated pest management and of alternative approaches or techniques in order to reduce dependency on the use of pesticides.

In terms of the sustainable use of plant protection products, the National Action Plan contains, in particular, qualitative and quantitative objectives, measures to reduce health and environmental risks and the impacts of the use of plant protection products on human health and the environment, and support for the development and introduction of integrated pest management and of the alternative approaches or techniques used in plant protection.

2. Legal basis

2.1. Applicable EU legislation

In line with Articles 2 and 7 of Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme, a common legal framework for achieving a sustainable use of pesticides should be established, taking account of precautionary and preventive approaches.

In adopting the 6th Environment Action Programme (6th EAP), the European Parliament and the Council recognised that the impact on human health and the environment of pesticides, in particular plant protection products, must be further reduced. They underlined the need to achieve a more sustainable use of pesticides as well as a significant overall reduction in the risks and in the use of pesticides consistent with the necessary crop protection.

Subsequently, on 12 July 2006, the European Commission published a document entitled '**Thematic Strategy on the Sustainable Use of Pesticides**' under reference number 'COM(2006) 372 final' which aims to support forms of agriculture and pest management methods that restrict or better target the use of plant protection products, such as organic farming, integrated pest management, or the use of less susceptible varieties. It is important to encourage rational and precise pesticide use, as well as appropriate crop rotation practices. Furthermore, the **Thematic Strategy on the Sustainable Use of Pesticides** considers it important to improve the behaviour of pesticide users (in particular professional users), who are responsible for a number of misuses including overuses, by ensuring better training and education.

Improvement of the quality and efficacy of pesticide application equipment is also necessary, to enable pesticide users to optimise the effectiveness of the treatments whilst minimising any adverse impact on human health and the environment. Furthermore, the use of pesticides is affected – directly or indirectly – by legislation in other policy areas, such as water policy, agricultural policy, worker protection and research.

The specific objectives of the Thematic Strategy that could contribute to achieving the overall objectives are:

- a) to minimise the hazards and risks to health and the environment from the use of pesticides,
- b) to improve controls on the use and distribution of pesticides,
- c) to reduce the levels of harmful active substances including through substituting the most dangerous with safer (including non-chemical) alternatives,
- d) to encourage low-input or pesticide-free cultivation, among other things through raising users' awareness, promoting the use of codes of good practices and promoting consideration of the possible application of financial instruments,
- e) to establish a transparent system for reporting and monitoring progress made in the fulfilling of the objectives of the strategy, including the development of suitable indicators.

In line with the Thematic Strategy on the Sustainable Use of Pesticides, **Directive 2009/128/EC, which currently applies only to pesticides which are plant protection products**, was adopted. It is expected, however, that the scope of this Directive will be extended to include biocidal products as defined by Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market.

2.2. Other related EU legislation

Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC, applicable as of 14 June 2011

Regulation (EC) No 1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work (fourteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work (Sixth individual Directive within the meaning of Article 16(1) of Council Directive 89/391/EEC)

Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste

Council Directive 91/689/EEC of 12 December 1991 on hazardous waste

Directive 2009/127/EC of the European Parliament and of the Council of 21 October 2009 amending Directive 2006/42/EC with regard to machinery for pesticide application

2.3. National legislation

Act No 405/2011 on plant care and amending Act of the National Council of the Slovak Republic No 145/1995 on administrative fees, as amended (hereinafter 'Act No 405/2011'), under which the Ministry of Agriculture and Rural Development of the Slovak Republic (hereinafter 'MoARD') approved the National Action Plan in the field of plant protection products and under which Directive 2009/128/EC is transposed into Slovak law.

Section 36 of Act No 405/2011 requires the MoARD to develop a national action plan on plant protection products in cooperation with the control institute, a delegated organisation and expert centres, and also with public participation, to submit the plan to the Commission, and to update it every five years.

In accordance with Section 40(a) to (i) of Act No 405/2011, the MoARD has issued the following general binding rules:

- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 485/2011 laying down details of plant protection products
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 486/2011 laying down the details of the conditions, procedures and deadlines for the implementation of provisions on biological activity tests, requests, the principles of good experimental practice, audits and certification, the extension of the scope of certificates, and recertification
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 487/2011 on integrated pest management and the application thereof
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 488/2011 laying down details of principles and measures to protect human health, drinking water sources, bees, animals, water and other non-target organisms, the environment and specific areas in the use of plant protection products
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 489/2011 on conditions and procedures for the registration and inspection of application equipment
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 490/2011 laying down detailed conditions, requirements and procedures for the implementation of provisions on the aerial application of plant protection products and on requests for aerial application permits
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 491/2011 on the keeping of records on plant protection products and on the reporting of data, conditions and procedures for the storage and handling of plant protection products and the cleaning of used application equipment
- Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 492/2011 on training in the field of plant protection products.

The MoARD decrees issued in accordance with the enabling provisions of Section 40 of Act No 405/2011 entered into effect on 1 January 2012.

Section 39 of Act No 405/2011 lays down penalties which the Central Controlling and Testing Institute in Agriculture, Bratislava (the 'CCTIA') imposes on natural persons engaged in business and on legal persons for non-compliance with the obligations established by this Act and the relevant regulations of the European Union. Similarly, the laws listed below lay down fines and penalties for non-compliance with the relevant provisions, including in the use of plant protection products.

Act No 543/2002 on nature and landscape protection, as amended

Act No 364/2004 on water and amending Act of the National Council of the Slovak Republic No 372/1990 on misdemeanours, as amended (the Water Act), as amended

Act No 223/2001 on waste, as amended

Act No 119/2010 on packaging and amending Act No 223/2001 on waste and amending certain laws, as amended

Act No 67/2010 on conditions for the placing of chemical substances and chemical mixtures on the market and amending certain laws (the Chemical Act)

Act No 355/2007 on the protection, support and development of public health and amending certain laws, as amended, regulates, inter alia, professional competence and the issuance of certificates of professional competence to work with highly toxic substances and products and with toxic substances and products. Further details are laid down in implementing rules, particularly in the relevant regulations of the Slovak Government.

3. Objectives of the National Action Plan

The Slovak Government's policy statement officially declared that the Government would strive to provide quality domestic plant production: 'Support for rural development and effective care of the countryside also necessitates the integration of all critical activities in the countryside into a single functional unit. The Government will also focus on support for all other positive external factors of the agri-food sector, including maintenance of the cultural nature of the countryside, protection and management of the environment, and acceleration of the development of the rural economy. The Government will respect EU programming documents aimed at promoting economic growth and economic performance in agriculture and forestry, in keeping with the principles of a balance between economic and eco-friendly farming practices. This is a prerequisite for a sustainable social market economy in the countryside.'

The Slovak Republic will support preparations for measures related to the adaptation of agriculture to climate change through farming practices that will increase water retention in the countryside, and the preparation of an effective policy for the conservation and development of improved water management facilities (irrigation and drainage).'

The safeguarding of high-quality and healthy agricultural production is a matter of common concern for professionals and the general public alike. However, crop production cannot exist without essential inputs. Pesticides play a key role in the pursuit of the quantitative targets of both crop production and forestry, but their use needs to be of such a standard and method that no risk is posed to human health and the environment, or that risks are minimised as much as possible. Trade globalisation and climate warming create conditions in which harmful organisms flourish, and the need to provide protection against them therefore continues. In this respect, it would be impossible to ensure a sufficient scale of crop production and forestry without pesticide use. The aim of the National Action Plan is to minimise the hazards and risks to human health and the environment arising from the use of pesticides by setting objectives, actions, measures and indicators to reduce these potential risks. For the purposes of the National Action Plan, 'pesticides' means plant protection products within the range defined in Article 2 of Regulation (EC) No 1107/2009.

The areas in which targeted activities might contribute to more careful farming or reduce the risks associated with the use of plant protection products include research and development into methods for integrated plant protection, the introduction of integrated pest management, research and development of new environmental best practices for agriculture and forestry in the different geographical and climatic conditions of the Slovak Republic, the use of alternative techniques and procedures, the provision of initial and additional training, and arrangements for measures contributing to health protection in work with plant protection products and to their correct application.

Achievement and fulfilment of the National Action Plan will also be helped by ensuring that there is public awareness of the potential risks arising from the use of plant protection products and the prevention of these risks, by public awareness of the proper storage and application of plant protection products, and by the introduction of guidance for different areas related to the use of plant protection products.

The important tools for achieving the objectives of the National Action Plan include legislative arrangements and the subsequent implementation and purposeful application of a compulsory training system for persons who, under EU and Slovak national legislation, have not previously been required to attend compulsory training on plant protection products. This system will give the broad professional and general public access, in an appropriate form, to the full range of expert information on all areas which are covered by the National Action Plan and which are consistent with Annexes I to III of Directive 2009/128/EC.

4. Measures for achieving the targets

4. 1. Consumer protection and residues of plant protection products in food and water

4. 1. 1. Residues of plant protection products in food

The European Commission strictly regulates the system for the authorisation and assessment of pesticides in terms of their impact on the environment, and the method of authorisation and use thereof, as these are active substances with significant toxic properties.

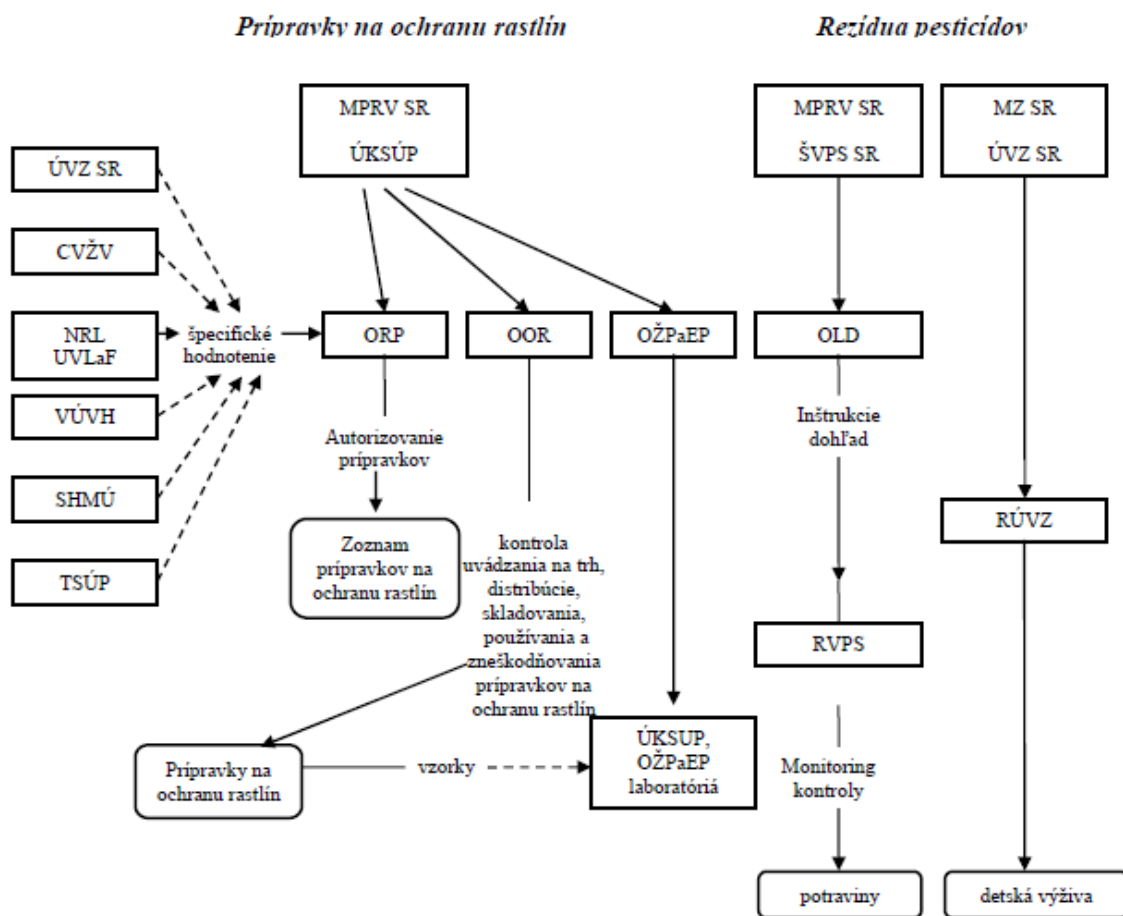
The European Commission also devotes significant attention to the forms of research, monitoring and control of pesticide residues in food. By means of the relevant regulations, it organises the scope of control of residues in food in the European single market. The Slovak Republic, as one of the countries of the European Union, is required to carry out the European Union's multiannual coordinated control programme in order to ensure compliance with maximum levels of pesticide residues in and on food of plant and animal origin. In addition to this coordinated programme, European legislation requires the preparation and implementation of a national programme for the control of pesticide residues. In the Slovak Republic the national programme for the control of pesticide residues in food is drawn up as a single document incorporating both of these components.

European legislation requires specific planning procedures for controls and the processing of control results. The European Commission annually increases its requirements in terms of the scope of analyses of residues of active substances and their metabolites in food, and extends monitoring to further commodities.

The control of pesticide residues in food is within the competence of the Ministry of Agriculture and Rural Development and the Ministry of Health.

The control of pesticide residues in food in the Slovak Republic is carried out according to the distribution of powers laid down in Act of the National Council of the Slovak Republic No 152/1995 on food, as amended – in foods other than baby food at the MoARD, and in baby food at the MoH. The following diagram shows which components of both ministries are involved in the process of controlling pesticide residues in food and how:

Distribution of the competence of central government authorities in the field of plant protection products:



<i>Plant protection products</i>				<i>Pesticide residues</i>		
PHA		MoARD CCTIA			MoARD SVFA	MoH PHA
APRC						
NRL UVMP	specific evaluation	ORP	OOR	OŽPaEP	OLD	
WRI						
SHMI		Product authorisation			Instructions – supervision	
ATTI						
		List of plant protection products	control of the marketing, distribution, storage, use and disposal of plant protection products			RPHA
					RVFA	
	Plant protection products	samples		CCTIA OŽPaEP laboratories	Control monitoring	
					food	baby food

The State Veterinary and Food Administration of the Slovak Republic (SVFA) is responsible for the methodological management and evaluation of the control of pesticide residues in food. Regional Veterinary and Food Administrations (RVFA) coordinate activities within their

competence, take samples, and carry out checks on food business operators and producers. Samples are analysed by the State Veterinary and Food Institute (SVFI) in Bratislava. At the request of the SVFA, the Food Research Institute performs a risk analysis in cases where samples are discovered with excessive pesticide content. At the Ministry of Health, baby food samples are taken by regional public health authorities (RPHA). These samples are analysed in a laboratory at the Public Health Authority of the Slovak Republic.

Pesticide residues in food are officially controlled according to the requirements of the harmonised food legislation governing this area.

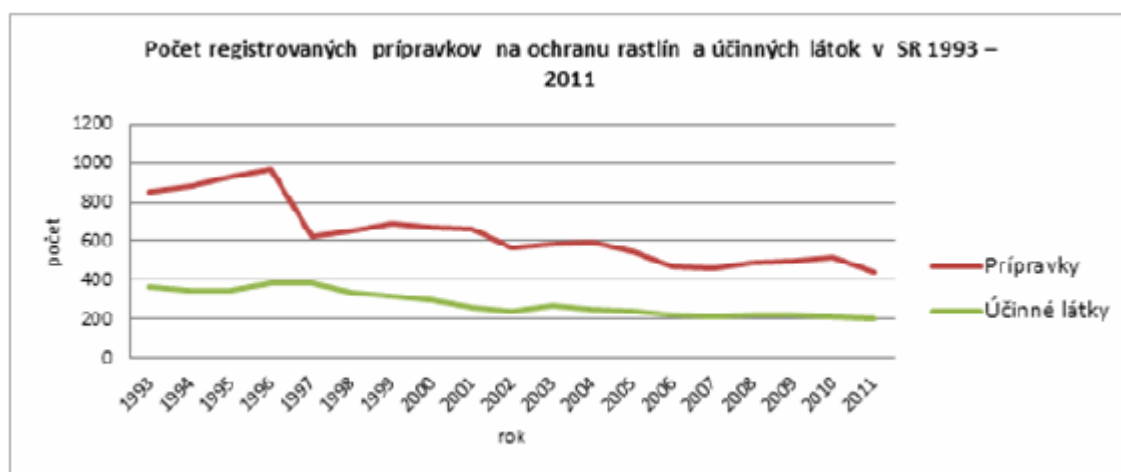
4.1.2. Authorisation, control and use of plant protection products

Regulation (EC) No 1107/2009/EC is implemented in the Slovak Republic by Act No 405/2011. Under this law, the organisation delegated to coordinate evaluations and issue decisions on the authorisation or permission of plant protection products is the CCTIA, which also keeps records of sales and consumption of plant protection products and carries out checks related to plant protection products. In practice, this means that each plant protection product must be marketed in the Slovak Republic in accordance with an authorisation decision or permit issued by the CCTIA.

In recent years, the procedure for reviewing existing active substances has significantly reduced the number of active substances permitted.

In the EU, 1 266 active substances in plant protection products are currently registered. Of this total number, 412 (32.5%) active substances are authorised for use in plant protection products in the EU. Seventy-four (5.8%) active substances are currently being evaluated and 780 (61.6%) active substances have not been approved and their use in the EU is not permitted.

The reduction in the number of active substances in the EU has also affected the number of registered active substances in the Slovak Republic and the related number of registered/authorised plant protection products in the Slovak Republic (Graph 1).



Graph 1. Number of registered active substances and plant protection products in the Slovak Republic in 1993–2011

A comparison of the number of plant protection products registered/authorised in the Slovak Republic between 2008 and 2011 (as at 1 December 2011) is shown in Table 1.

Table 1. Number of plant protection products in the Slovak Republic registered/authorised between 2008 and 2011

Products registered/authorised	Number			
	2008	2009	2010	2011
Registered/authorised plant protection products in bulk forms	414	426	432	441
Registered/authorised plant protection products in small packages	109	105	99	75
Products authorised for parallel trade in bulk form – SALES + PUTTING INTO CIRCULATION	33	40	39	34
Products authorised for parallel trade in bulk form – OWN CONSUMPTION	83	83	37	27
Products authorised for parallel trade in small packages – SALES + PUTTING INTO CIRCULATION	0	12	14	20
Products authorised in organic farming		84	79	20

Official control of pesticide residues in food

The official control of pesticide residues in food is fully harmonised at Community level. Each Member State is required to submit to the EFSA a '*National Plan for the Control of Pesticide Residues in Food of Plant Origin and Animal Origin and in Baby Food*' along with the results of such controls via the EFSA Focal Point, which is the MoARD Department of Food Safety and Nutrition, and the pesticide monitoring network, which is delegated to the SVFA in the Slovak Republic. The official control of pesticide residues in food and feed in the Slovak Republic is the responsibility of the SVFA, and pesticide residues in baby food are officially controlled by the PHA. At the request of the SVFA, the FRI performs risk evaluations for the needs of the RASFF.

The results of the official controls, including those of foods of plant origin, are published annually on the SVFA website.

4. 1. 3. Residues of plant protection products in drinking water

Contaminated drinking water, like food, may pose a risk to the consumer.

Reducing the exposure of drinking water to plant protection products, combined with consistent and targeted checks on drinking water quality, can maintain and improve the quality of drinking water. A set of protective measures to protect the environment as a whole contributes to this objective.

The Water Framework Directive (Directive 2000/60/EC), which paved the way for the creation of a transnational approach to protecting the quantity and quality of water, significantly strengthens the environmental perspective of the water protection process. The Directive establishes a legal framework for the protection and improvement of ground and surface water and the sustainable use of water. The main environmental objective of the Directive is to achieve a good status for all waters by 2015 or, as the case may be, by 2027. The essential requirements and objectives of the Directive concerning the potential impact of the use of plant protection products are focused on the following areas:

- preventing further deterioration and protecting and enhancing the status of aquatic ecosystems (ground and surface waters) and the terrestrial ecosystems and wetlands directly dependent on aquatic ecosystems in terms of their water needs;

- sustainable water use based on long-term protection of available water resources;
- enhanced protection and improvement of the aquatic environment through, inter alia, specific measures for the progressive reduction of discharges, emissions and leakage of priority substances and the cessation or phasing-out of discharges, emissions and leakage of priority hazardous substances;
- ensure the progressive reduction of pollution of groundwater and prevent its further pollution and deterioration.

In the Slovak Republic, special water protection is required in protected water management areas established by law, in water resource protection zones established by a decision of the district environmental office, and in vulnerable areas defined by law.

Water quality monitoring is the tool for assessing water pollution due to pesticides and for selecting the most appropriate measures to ensure water protection, with an effective possibility of tracing potential sources of pollution and thus providing a means to ensure redress, where necessary. The system of corrective and preventive measures is addressed in the Water Plan of the Slovak Republic. Monitoring allows verification of the proper use of products, the potential impact of groundwater contamination as a result of the use of products and the efficiency of measures proposed for protecting sources of drinking water.

The simultaneous application of the basic monitoring of pesticides in water under the Water Framework Directive does not adequately reflect the impact of the use of plant protection products in relation to conventional monitoring, the location and extent of monitoring, and the range of parameters controlled. This monitoring is aimed at general pollution caused only by certain selected pesticides, but it is insufficient from the perspective of consumer protection and protection of the sources of drinking water that are used, even potentially, at the same time.

Management measures in water resource protection zones are primarily intended to protect water quality.

Farming restrictions are set out in decisions declaring protection zones. In level-one water resource protection zones, use of chemicals is prohibited; in level-two water resource protection zones, use of chemicals is prohibited, with restricted use in water resource protection zones (SPZs) under the current list of authorised plant protection products.

Action proposed

- a) To demand increased intensity in the monitoring of foods, focusing on pesticide residues in food of plant origin **imported from third countries** in order to eliminate imports of high-risk goods from third countries as much as possible,
- b) to maintain a system for publication of the findings of official controls carried out by the CCTIA, SVFA, PHA, SHMI and WRI, summarising the findings of controls on plant protection products, the results in respect of residues of plant protection products in food of plant origin and the results in respect of water monitoring,
- c) arrange for a review of the SPZ and PZ criteria,
- d) to draw up methodological guidelines for the use of plant protection products in relation to water in protected water management areas, drinking water protection zones, vulnerable and sensitive areas (public green areas, buffer zones for watercourses), protected areas (wetlands), etc.,
- e) to draw up a methodology for the use of low-risk plant protection products in sensitive areas and provide special access to these areas (public green areas),
- f) to arrange for targeted laboratory analyses of drinking water in the form of close cooperation between entities producing drinking water and the CCTIA, which collects data on the use of plant protection products,

- g) to secure introduction of the identification of SPZ areas for farmers via the LPIS system,
- h) to review the conditions governing restrictions on the use of products in SPZs,
- i) to raise farmers' awareness of compliance with protective distances from water resources when using products, including the use of agritechnical measures,
- j) to arrange for special-purpose monitoring of the impact of the plant protection products used in the Slovak Republic to be incorporated into the MoEnv Water Monitoring Programme. To target this monitoring on drinking water sources using both conventional and special passive water sampling,
- k) to cooperate with the MoEnv on the creation of a special-purpose monitoring plan to monitor pesticides in water and on the specification of relevant pesticides for the purposes of the Water Pollution Reduction Programme,
- l) to pay attention to enhanced cooperation between ministries and professional organisations in the exchange of information on controls and their results and measures to reduce pesticide residues in food of both plant and animal origin and in drinking water, and to the use of such information, in the form of an inter-ministerial working group and an agreed information exchange system.

Responsible

The SVFA, PHA, CCTIA, organisations within the competence of the MoEnv, which means the WRI and SHMI as far as the monitoring of surface water, groundwater and drinking water is concerned.

4.2. Protection of human health

Plant protection products classified as toxic, highly toxic, carcinogenic, mutagenic or toxic for reproduction are not authorised for use in small packages; their use is restricted to professional use. Despite this, we encounter cases of poisoning among the population every year.

Although the levels to which operators are exposed when working with plant protection products are calculated or determined in such a way as to be acceptable, the importance of personal health protection should be emphasised through education and information available on the possible known effects of use of plant protection products. Basic safety data related to the use of plant protection products can be found on the product label in the form of warning texts and symbols; more detailed information is provided on the safety data sheet (hereinafter 'SDS'). Persons selling plant protection products in bulk form are required to provide customers with general information regarding the risks to human health and the environment associated with use of the plant protection products. The information provided should focus mainly on the safe use and proper storage and handling of the plant protection products, on potential hazards, exposure, the safe disposal of residues and packaging, and on alternatives that are low risk and can be used to achieve a comparable effect in terms of plant protection.

In the Slovak Republic, the National Toxicological Information Centre (hereinafter 'NTIC'), Department of Occupational Medicine and Toxicology, FoM CU, University Hospital in Bratislava, provides a 24-hour telephone consultation service for poisoning by medicinal products, chemicals, pesticides, drugs, plants, fungi and animal poisons.

Since 1992, the NTIC has been a member of the WHO-affiliated European Association of Poisons Centres and Clinical Toxicologists (EAPCCT), which provides professional and methodological guidance in the activities of all poison control centres.

According to Act No 67/2010 on conditions for the placing of chemical substances and chemical mixtures on the market and amending certain laws, as amended, an undertaking must send an

SDS to the NTIC when placing a product on the market (see www.ntic.sk). This is how the NTIC database of all plant protection products on the Slovak market, as well as registered biocides is supplemented and updated. Information on the composition of plant protection products forms the basis for drawing up procedures and prognoses that are helpful to physicians when treating patients poisoned by a particular product.

The Ministry of Health of the Slovak Republic, pursuant to Section 45(1)(b) of Act No 576/2004 on health care, services related to health care and amending certain laws, as amended by Act No 350/2006, has issued an Expert Guideline on the Method for Reporting and Recording Poisoning (No 107), according to which all cases of poisoning must be reported to the NTIC, including those caused by pesticides or biocides.

An analysis of NTIC consultations in the years 2005 to 2009 showed that consultations on pesticides and biocides together (as these are chemically similar substances and the NTIC does not differentiate between these two categories in the statistics) account for 8.2% to 10% of the total number of consultations. Insecticide poisonings comprise a group with a statistically much higher risk of more severe poisoning. Most poisoning is caused by organophosphate products and pyrethroids.

A more detailed analysis of deaths in relation to pesticides shows how far-reaching the consequences of accidental or intentional ingestion of pesticides can be. The high financial cost of treating these patients is indicated by the medical procedures applied (the use of the antidotes Toxogonin, haemodialysis, resuscitation, monitoring, laboratory tests...). These considerable costs should be a sufficient incentive to intensify awareness campaigns on the potential effects of pesticides on human health.

Statistics show that pesticide and biocide poisoning is more common in adults than in children. The high proportion of poisoning among children aged under five years is alarming and can be attributed to a lack of awareness on the part of parents or to an underestimation of the danger. These products are all the more attractive to young children because of their shape, the intensive colour of some of the products, and their easy availability, e.g. coloured granules of rat poison placed in a bowl on the floor. In terms of gender, men have long predominated over women in the poisoning cases evaluated. .

An analysis of deaths, together with many years of experience, shows the recurring scenarios in which poisoning occurs. These are mainly:
the pouring of pesticide into unlabelled bottles, which is subsequent mistaken for a drink, the application of a product in violation of rules on the protection of health at work, careless handling of pesticides (e.g. organophosphates are absorbed by the skin and inhalation), misuse for suicidal intentions, and, among children, the licking/chewing of traps for pests that are readily available (e.g. on the ground), because of their interesting shape or colour.
Awareness of these methods of poisoning provides a basis for eliminating the possibility of the most common forms of poisoning.

The severity of each case is classified into the following categories under an agreement within the framework of the EAPCCT:

Level 0 – no subjective or objective symptoms of poisoning,

Level 1 – mild poisoning,

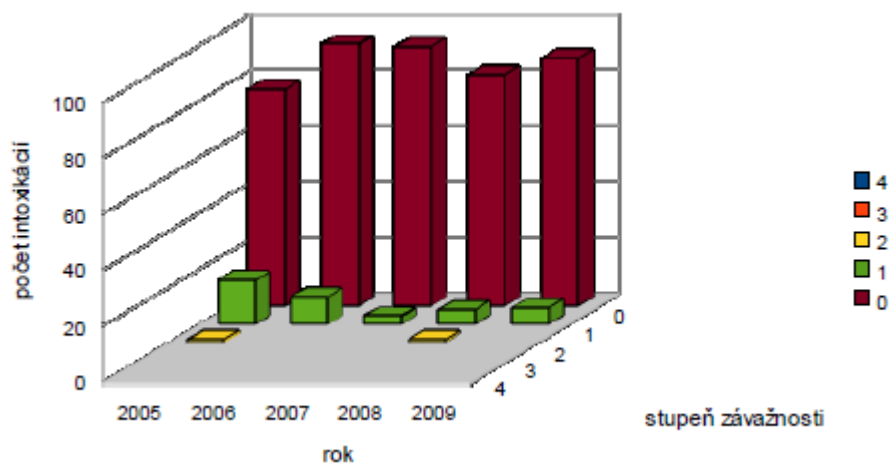
Level 3 – moderate poisoning,

Level 3 – severe poisoning,

Level 4 – lethal poisoning.

Statistics on severity among children and adults is shown in Graphs 1 (children) and 2 (adults).

Graph 2: Levels of severity of poisoning in children.

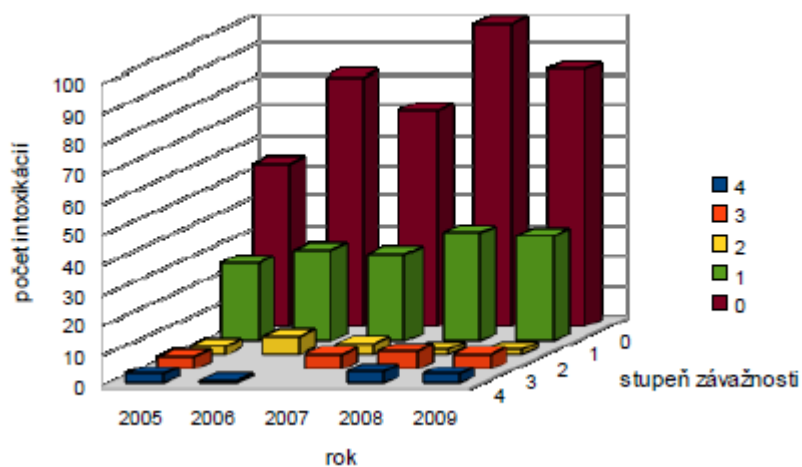


number of cases of poisoning

year

level of severity

Graph 3: Levels of severity of poisoning in adults.



number of cases of poisoning

year

level of severity

Promoting health protection and employer obligations

The main obligations in relation to the use of plant protection products are defined for professional users in Act No 355/2007 on the protection, support and development of public health and the Government Regulation No 355/2006 on the protection of employees from risks related to exposure to chemical agents at work. This legislation is of a preventive nature and requires the employer to reduce risks at work by substituting hazardous substances with less dangerous ones, thereby focusing on occupational disease prevention. Employers are required to identify any hazards from chemical agents at work and, if they are present, to consider the risk of these agents and to draw up a risk assessment.

According to Section 5 of Act No 124/2006 on safety and the protection of health at work and amending certain laws, as amended, employers are obliged to apply general principles of prevention in implementing the measures necessary to ensure health and safety at work, including the provision of information, training and the organisation of work and resources. According to Section 6(1)(q) of the said law, 'in the interests of ensuring safety and health at work, employers shall ensure the implementation of health surveillance, including preventive examinations at regular intervals in relation to the nature of the work and working conditions in the workplace, and also when requested by an employee'. Labour Inspectorate data show that long-term health damage is not reported in the use of plant protection products.

Under Sections 15 and 16 of Act No 355/2007 on the protection, support and development of public health, as amended, a special condition for the performance of work with highly toxic substances and products and with toxic substances and products that may also be classified as plant protection products is the requirement of professional competence to work with these types of substances. On completion of training, requirements for the verification of professional competence are confirmed by a certificate issued by the competent public health authorities, based on successful completion of an examination or length of professional experience.

Training is provided by the staff of scientific research and professional institutions.

The protection of health in relation to work with plant protection products is one of the topics of training under Act No 405/2011; it aims to provide information on the risks of using plant protection products, on classification of the possible effects on the human body, and especially on protective measures in case of contact with plant protection products. Awareness of safe procedures in the use of plant protection products is essential in order to be prepared for unexpected situations, such as a machinery malfunction during application. Knowledge on the completion of training is verified by a written test; successful graduates receive a certificate of professional competence.

Post-authorisation control of plant protection products

The post-authorisation control system in the Slovak Republic was created in 1995 by Act No 193/1995, as amended. The aim of the system of post-authorisation control of plant protection products is effective control of the placing of plant protection products on the market and their use within the meaning of the applicable legislation, the prevention, elimination or reduction of risks associated with the sale of plant protection products, effective action to detect the trafficking of plant protection products, control of the use of unauthorised plant protection products, control of old plant protection products that may constitute an environmental burden, control of imports of products from third countries, control of products authorised for parallel import, and control of compliance with the principles of good farming practice.

In the control of plant protection products, an emphasis is also placed on professional competence in working with highly toxic and toxic products, approval of plant protection product storage facilities by regional public health authorities if highly toxic products are stored there, and control related to the protection of non-target organisms and the control of drinking water resources.

Official post-authorisation control is carried out by CCTIA plant health inspectors in accordance with the 'Collection of Methodological Guidelines for the Post-authorisation Control of Plant Protection Products in the Slovak Republic'. Controls are focused on retail stores, all warehouses, controls at growers and end-users of plant protection products, and controls of plant protection product manufacturers in the Slovak Republic.

Imports of plant protection products are controlled by the staff of the Financial Directorate of the Slovak Republic (Customs Section), in collaboration with CCTIA plant health inspectors, at all border inspection posts in the Slovak Republic.

The control and monitoring of abandoned warehouses for plant protection products and the disposal of the products in them are the responsibility of the Slovak Environment Agency.

The disposal of unused plant protection products which, under Act No 405/2011, are recorded as 'waste' and pose a potential risk of danger to the environment, is carried out by a company licensed to handle and dispose of hazardous waste. The CCTIA then checks that disposal has been carried out as ordered.

Preventive measures against the counterfeiting and illegal importation of plant protection products are based on the following principles/policies:

- targeted control activities on the EU's external border, and during customs declaration in the Slovak Republic,
- exchanges of information between the Financial Directorate, the Police Force, and the CCTIA on imports of plant protection products to the Slovak Republic, enabling 'suspicious' plant protection products to be stopped before they are placed on the market in the Slovak Republic,
- control activity aimed at holders of authorisations for parallel imports of plant protection products in the Slovak Republic,
- control activities focused on the area of trade between manufacturers of plant protection products, or holders of registration thereof, and end-users of plant protection products,
- intensification of controls directly at the premises of users during the application season.

Use of plant protection products by non-professional users

The first requirement for the consumption of plant protection products by non-professional users is an assessment of plant protection products for small packages which is specific about the potential risks to non-professional users and focuses on eliminating the potential negative impacts of these products on users to the greatest extent possible.

Plant protection products classified as toxic, highly toxic, carcinogenic, mutagenic or toxic for reproduction are not authorised for small packages available to non-professional users (gardeners). Others are authorised and are thus available on the market. Small packages at garden centres, gardening stores and drugstores are purchased by a very broad section of the general public, often from the ranks of pensioners. Here it is absolutely necessary for the sales staff to be professionally trained and to be able to provide customers with information on choosing the right product for the specific disease or pest, mainly in the fields of fruit and vegetable growing, viticulture and ornamental horticulture, on the correct application of products, proper storage and disposal of product residues, and on safety when working with plant protection products.

Action proposed

- a) to arrange for a system of compulsory training to be created to complement the expertise of staff selling plant protection products; this will help to ensure that plant products grown in gardens are treated with the smallest possible quantities of plant protection products or only to the extent strictly necessary,
- b) to arrange non-compulsory training for members of horticultural associations,

- c) to intensify objectively and scientifically based information campaigns about the possible effects of plant protection products on human health in the event of improper handling of pesticides (nursery centres, schools, television, radio, leaflets, brochures, presentations to the general public and professionals),
- d) to ensure the provision of timely information on the possibilities of traceability of illegal products for all companies involved in the distribution of plant protection products by offering professional training under Section 32 of Act No 405/2011,
- e) to arrange for multilateral cooperation between the NTIC, PHA and National Labour Inspectorate (NLI) in case of legislative amendments concerning the packaging of pesticides, e.g. sufficiently visible warnings of potential hazards on the packaging, safety caps on bottles, and in the exchange of information on controls of compliance with relevant legislation in practice,
- f) to arrange for legislative amendments to support the sending of discharge reports following the hospitalisation of poisoned patients, as these are ideal for monitoring the impact of pesticides on the human body,
- g) if there are sufficient funds, to involve the Department of Occupational Medicine and Toxicology in short-term or long-term studies of workers coming into contact with pesticides (in production, farmers when applying them), or people (the local population) present in or entering treated areas,
- h) to require more intensive monitoring of compliance with preventive medical examinations and the provision of the required personal protective equipment by employers to protect persons who come into direct contact with plant protection products.

Responsible

MoARD, CCTIA, NTIC, PHA, NLI bodies, Financial Directorate, Customs Section, Police Force, training organisations commissioned by the MoARD.

Cooperating entity:

SCPA

4.3. Environmental protection

4.3.1. Protected sites

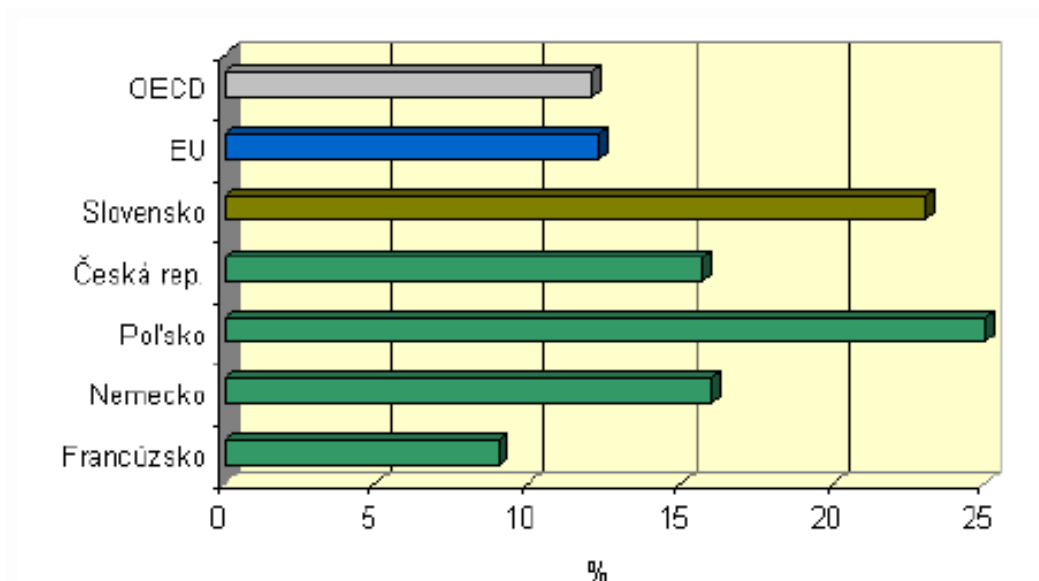
The protection of Slovak nature has long been a priority for the Ministry of the Environment of the Slovak Republic, the Ministry of Agriculture and Rural Development of the Slovak Republic, and NGOs. A system of legislative regulations has been created for the effective protection of the environment, especially Act No 543/2002 on nature and landscape protection, as amended (hereinafter 'Act No 543/2002 on nature and landscape protection'). Its application in practice, is the responsibility of multiple organisations (district environment authorities, State Nature Conservancy, protected site authorities, etc.). Act No 543/2002 on nature and landscape protection sets out a concept of territorial protection of nature and the landscape over five different protection levels. In the Slovak Republic, as at 31 December 2006, there was a total of 1 134 943 ha in the second to fifth protection levels, equivalent to 23% of the territory. Of these protected sites, forest land accounts for approximately 73% of the total area in the following structure.

- level 2 – 14 protected landscape areas encompassing a total of 522 579 ha, including protection zones,
- level 3 – nine national parks with an area of 317 890 ha, plus protection zones with an area of 270 128 ha (although these are subject to level-2 protection),

- levels 4 and 5 – 703 small protected sites with an area of 103 466 ha, plus protection zones with an area of 4 795 ha.

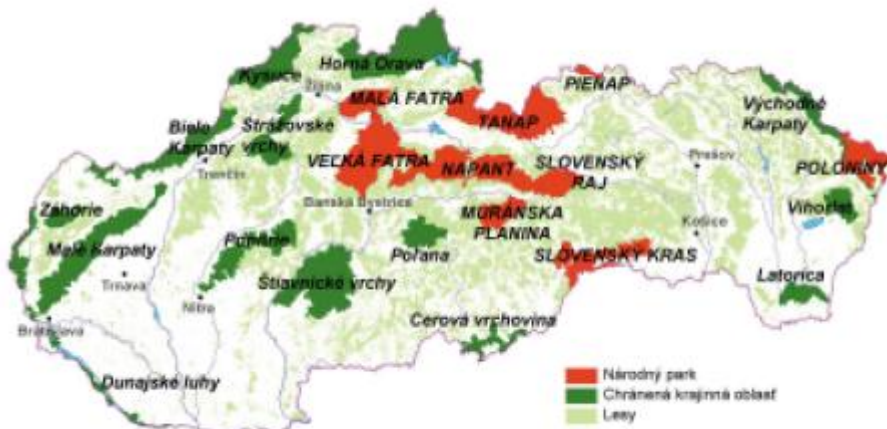
Act No 543/2002 on nature and landscape protection also lays down a system of care for protected sites in the form of detailed conditions for the protection of such sites. The objectives and principles of such care are incorporated into forest management plans and become binding on forest managers. The principles of nature protection, however, are followed not only in forests that are in protected sites; they are also systematically respected by forest owners in special-purpose forests and in commercial forests.

Graph 4: Area of protected sites – international comparison (1997)
source: OECD



OECD
EU
Slovakia
Czech Republic
Poland
Germany
France

Image of sites with level 2 and 3 protection.



- National park
- Protected landscape area
- Forests

Invasive plant species (seven species in all) are addressed in Act No 543/2002 on nature protection and in Decree of the Ministry of the Environment No 24/2003, as amended by Decree No 173/2011. The Decree lays down procedures for the disposal of invasive non-native plant species, especially by mechanical means that cause only minimal environmental risks with respect to their habitats (often next to watercourses and in areas with a high degree of conservation). The use of plant protection products at these levels of protection requires authorisation from the competent environmental authority, or their use is prohibited.

Use of plant protection products should also be minimal or absent in the protection zones of water sources designated, under water legislation and in Natura 2000 sites, for the purpose of establishing safeguards in accordance with Directives 79/409/EEC on the conservation of wild birds and 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. Agricultural business in these areas may also be financially supported by agri-environmental subsidies under European support schemes. The delimitation of these areas is the responsibility of the professional organisations and state institutions in the environmental sector. The use of plant protection products is either entirely excluded or possible after an exemption has been granted in the event of a serious threat from harmful organisms.

Decree of the MoARD No 488/2011 laying down details of principles and measures to protect human health, drinking water sources, bees, animals, water and other non-target organisms, the environment and specific areas in the use of plant protection products implements the requirements of Directive 2009/12/EC in specific areas. In particular, these areas comprise public parks, gardens, sports fields, recreation centres, school grounds and playgrounds or areas close to medical facilities. In these areas, low-risk plant protection products are used; these are products with minimal side effects or products with minimal impact on all components of the environment. Before a product other than a low-risk product is used, an assessment of that product must be conducted by a professional centre in accordance with Section 7(g), point one, of Act No 405/2011 on plant care.

4.3.2. Public green areas

Directive 2009/128/EC requires that plant protection products are applied as little as possible or not at all in areas used by the general public, such as public parks and gardens, sports and recreation grounds, golf courses, school grounds and playgrounds, and areas close to medical facilities.

The use of plant protection products to protect public green areas now occurs almost exclusively only in the event of a severe pest problem. Because of the danger arising from the use of chemical plant protection products, the dominating factor in any procedure involving such products or the application of such products will be the protection of the health of persons whose movements cannot be significantly regulated or precluded in the treated area.

Prevention must be the starting point for protection. When selecting a mix of plant species as foliage, emphasis must be placed on species that can grow in the Slovak Republic without the use of chemicals, i.e. species that are either resistant to harmful organisms or are propagated under the conditions here or conditions very similar to them, and priority must be given to species of foliage that do not host quarantine pests, or that have been shown to withstand the pressure of harmful organisms in our country without human intervention, so that the use of chemical methods of protection is not required. Ideally, native plant species of Central European flora would be grown. Mechanical intervention should be preferred for weed-killing purposes. In the surroundings of ornamental trees and plantations of shrubs and flowers, mulching should use bark, gravel or impermeable (non-woven) films that are environmentally friendly. Their use ultimately saves money on the maintenance of public green areas and does not burden the environment.

Action proposed

- a) To raise the awareness of public greenery developers and designers of the opportunities for selecting an appropriate species mix in order to prevent pest problems,
- b) to prioritise adapted plant species and those which do not host quarantine pests,
- c) to prepare, in cooperation with organisations in the environmental sector, guidelines for municipal authorities and an information brochure on harmful organisms, and to draw up methodological guidelines on the use of plant protection products in sensitive areas in terms of specifying the risks of these products. To incorporate these materials into the generally binding regulations of municipal authorities on the management, creation, maintenance and protection of the green areas in their territory,
- d) to prioritise groundcover methods of combating weeds in public green areas,
- e) to use plant protection products only when necessary to combat the proliferation of harmful organisms,
- f) to ensure the mechanical disposal of volunteer wild solanaceous plant species (e.g. acacia, tree of heaven, Japanese knotweed) which are a source of unwanted weed infestation on land in the environment, including the boundaries and surrounding areas of orchards and vineyards, which are also a source of unwanted propagation of vectors of harmful organisms and other weed vegetation,
- g) to arrange for an amendment to the technical standards for the establishment of foliage, such as 'STN 83 7010 Conservation: Treatment, maintenance and protection of the tree line', which provides for the care, maintenance and protection of trees growing outside forest land in the built-up zones of municipalities,
- h) to enact restrictions on the use of plant protection products in the non-agricultural sectors, e.g. in parks, public green areas, sports grounds, etc. The definition of criteria for the granting of exceptions in situations where mechanical treatment is not sufficient,

- i) to arrange for a system of training in the use of plant protection products for employees of district environment authorities and the State Nature Conservancy, as well as for public greenery maintenance and protection staff.

Responsible

MoEnv, local government authorities, municipalities, MoARD, CCTIA.

4.4. Communication and awareness-raising

Sustainable use of plant protection products requires that the general public be properly informed about the risks arising from their use, their potential effects on human health and the environment, and alternative pest management methods. A large amount of information on plant protection products is currently available on the Internet. Information is provided by central government authorities and professional organisations (e.g. www.uksup.sk, www.mpsr.sk, www.los.sk, www.nlcsk.org, www.uniag.sk, www.uvz.sk, www.svssr.sk, www.zas.sk/sk/, www.agroporadenstvo.sk, www.agroportal.sk, www.agroserver.sk, www.sopsr.sk, www.vuvh.sk, www.uvzsr.sk), stakeholders (www.scpa.sk), numerous companies that sell or distribute plant protection products, and non-governmental organisations (www.srsweb.sk, www.cepta.sk, etc.).

Information on plant protection products is distributed primarily through the MoARD Journal (Vestník), which publishes lists of authorised plant protection products, and through agricultural magazines (Naše pole, Agro magazín, Farmár, Sady a vinice, Moderná mechanizácia v poľnohospodárstve, Záhradkár). In addition, information is distributed at agricultural shows and seminars organised by central government agencies and the distribution network for plant protection products.

The aim of the information provided is for plant protection products intended for both professional and non-professional use to pose the minimum possible risk to users and the environment. The information sources intended mainly for non-professionals largely focus on recommending non-chemical methods of pest and weed control. These sources of information choose a form of dissemination that is accessible to the target group of readers.

Popular and sought-after information sources include Slovak Television and Slovak Radio (RTVS), where agricultural programmes are an established tradition (Farmárska revue, Farmárova nedel'a, Hurá do záhrady).

For professional users of plant protection products there are also designated study materials, which are the subject of training in the field of plant protection products (section 4 6.)

Action proposed

- a) to organise training activities for farmers and gardeners at least once a year as of 1 January 2013 on effective methods of prevention, increasing the natural resistance of the agri-ecosystem and various crops, tolerant and resilient varieties, non-chemical alternatives for plant protection, and biological and integrated pest management at regional level ,
- b) to make more efficient and more objective use of the official results from the monitoring of pesticide residues in food, and to publish them in an appropriate form,
- c) to arrange for the monitoring and provision of objective and timely public information about counterfeit plant protection products and other illegal practices related to plant protection products,

- d) to create a cohesive information system concerning plant protection products in the environment.

Responsible

MoARD, CCTIA, MoEnv.

Cooperating entities:

SCPA, companies operating in the field of plant protection products, interest groupings, NGOs.

4.5. Training

According to Article 5 of Directive 2009/128/EC, Member States shall establish a system of initial and additional training for distributors, advisers and professional users of pesticides. Users must be informed of appropriate measures to reduce risks to human health and the environment.

4.5.1. Education and training in the Slovak Republic

The system of training in plant protection products in the Slovak Republic was established by Act No 193/2005 to the extent provided for by MoA Decree No 88/2009 on training in the placing of plant protection products or other products on the market and the application thereof. The system has been applied in practice since 2010, when the MoA authorised three organisations to provide the organisation thereof. Agroinštitút š. p. Nitra and the Slovak Agricultural and Food Chamber were entrusted with the agricultural and marketing areas. Agroinštitút š. p. Nitra was in charge of the organisational aspects of training and was responsible for applicators on the railways in collaboration with the Slovak Railways Central Institute of Education and Psychology. The National Forest Centre in Zvolen was charged with the organisation of training in forestry matters, providing training to the technical and administrative staff of the state enterprise Lesy SR, š. p., and continuing to train the staff of nurseries, manufacturing plants and service companies responsible for the application of products in the forestry sector.

Overall responsibility for training, under Act No 405/2011, rests with the MoARD; training is organised by organisations delegated by the MoARD. The organisational requirements and conditions of training are laid down for the authorised organisations by the MoARD.

Training is provided in a modular system and is differentially focused on various groups of participants. There is separate training for persons placing plant protection products on the market, for managers of agricultural holdings, and for applicators in agriculture. Separate training is provided to forestry workers and the staff of companies responsible for railway maintenance. Training has yet to be provided to workers responsible for the maintenance of public green areas, parks, playgrounds, hospitals, the areas around airports and roads.

Act No 405/2011 on plant care, implementing Directive 2009/128/EC, lays down the group of persons for whom training is compulsory and is one of the conditions for the placing of plant protection products on the market and their application. Decree No 492/2011 on training in the field of plant protection products regulated the extent of the training required under Article 5 and Annex I to Directive 2009/128/EC, which has been fully harmonised. The vocational part of training is the responsibility of instructors who are experts in various fields of training. The CCTIA approves and maintains a database of instructors. Literature has been produced by experts in each area included in the training and has been approved by the CCTIA. In 2012, the

publication 'Information for Vendors and Users of Plant Protection Products and Other Products' was updated and was expanded to include more practical information.

In the field of forestry, in addition to the above-mentioned literature, a separate special publication is used, entitled 'Use of Plant Protection Products in Forests (Handbook for Trainees on the Application of Plant Protection Products or Other Products in Forestry)'. In addition to this literature, trainees in the forestry sector also receive a CD with lectures; trainees in the agriculture sector receive a publication entitled 'Safe Use of Plant Protection Products', which includes a DVD. The DVD contains 16 videos demonstrating the proper handling of plant protection products.

Publication was approved by the CCTIA as course material for training within the meaning of Act No 405/2011. Certificates of professional competence are issued following completion of the appropriate training and the passing of a final written test, the questions for which are proposed by the CCTIA in collaboration with instructors working in different fields of training. A certificate of professional competence is valid for 10 years.

Specific expertise in the use of substances that pose a specific risk to health or the environment is required by Act No 355/2007 on the protection, support and development of public health and amending certain laws, as amended, which regulates professional competence and the issuance of certificates of professional competence to work with highly toxic substances and products and with toxic substances and products. Responsibility for this type of training and certification rests with the Public Health Authority of the Slovak Republic. Certificates are valid for an indefinite period.

Persons applying plant protection products or plant products intended for personal use are exempt from the obligation to undergo training and hold a certificate of professional competence. In addition, certificates are not required for distributors selling plant protection products for non-professional use. This is because products which are classified as toxic, highly toxic, carcinogenic, mutagenic or toxic for reproduction are not authorised as small packages.

Compliance with the training conditions laid down is controlled by the MoARD. Under Act No 405/2011, the CCTIA is responsible for controlling whether or not persons working with plant protection products are holders of a certificate of professional competence in the field of plant protection products.

4.5.2. Requirements for the sale of plant protection products

Distributors or vendors must have sufficient staff who must be available at the time of sale in order to provide sufficient information for customers in relation to plant protection, correct use, health protection and environmental risks, and other safety precautions. Vendors of small packages are required to provide non-professional users with basic information about the risks to human health and the environment, and safe handling, storage and use of plant protection products, including the disposal of packaging. They are also obliged to provide information on alternative low-risk protection.

4.5.3. Sales of plant protection products intended for professional users

Directive 2009/128/EC and Act No 405/2011 on plant care dictate that the plant protection products for professional use may be sold only by persons who hold a certificate of professional competence; such persons are required to provide the buyer with advice. It is a prerequisite for the buyer to have sufficient knowledge about the correct, sustainable and safe use of plant

protection products. All requirements relating to sales also apply to online sales (the conditions for online sales are set out in Section 32(11) of Act No 405/2011).

Action proposed

- a) to maintain, in its current form, the system of training and authorisation to organise training in the field of plant protection products aimed at marketing and application in agriculture and forestry,
- b) to include in that system persons working with plant protection products in the sectors of horticulture and landscaping, maintenance of public green areas, parks, playgrounds, hospitals, areas around airports and roads, and to adapt the level and focus of training to their needs,
- c) to make legislative arrangements for the inclusion of distributors selling products for non-professional use within the system of compulsory training,
- d) to focus training more on the practical aspect of training through videos and films,
- e) to establish a voluntary system for those persons who use products as private consumers (gardeners), and provide them with affordable literature intended for different groups and appropriately worded for this target group (brochures, leaflets, etc.), to use the opportunity to turn issues related to the use of plant protection products into a series of reports or films, and to provide these to the mass media as an educational programme for the public,
- f) to increase the time allocation for the training of farmers for RDP purposes, and for the training of advisers,
- g) to establish separate voluntary training in the field of integrated pest management,
- h) to lay down in legislation conditions for the renewal and revocation of certificates of professional competence in the field of plant protection products,
- i) to initiate the expansion of curricula at secondary schools and higher-education institutions to include topics incorporating training, particularly in the field of integrated pest management.

Responsible

MoARD, MoESRS, CCTIA, SUA.

Cooperating entities:

The SCPA, expert organisations in the environmental and health sectors, and organisations entrusted by the Ministry to organise training.

4.6. Storage and handling of plant protection products

Under Act No 405/2011 and Regulation (EC) No 1107/2009, only products that are authorised or permitted by the CCTIA in the Slovak Republic may be placed on the market in the Slovak Republic. In terms of consumer protection, the placing of products on market stalls, self-service sales outlets and vending machines is prohibited. The conditions for marketing products through Internet sales are set out in Act No 405/2011 on plant care.

Plant protection products which are classified as waste under Section 32(10) of Act No 405/2011 must not be marketed or used. Conditions for the classification of a product as waste are laid down in Act No 223/2001 on waste and amending certain laws, as amended (the Waste Act) and MoEnv Decrees No 283/2001 and No 284/2001.

Section 19 of Act No 223/2001 regulates the obligations of a waste holder. Basic obligations include the classification of waste according to the Waste Catalogue, the collection of waste

sorted by waste type, and the protection thereof from spoilage or theft, the separate collection of hazardous waste by type, the labelling of the waste in the designated manner, the disposal of the waste in accordance with the applicable regulations, the delivery of the waste only to persons authorised to dispose of the waste, the keeping and retention of records on the types and quantities of waste to be managed, and the reporting of data from the records to the central government authority with competence for waste management. Waste registration sheets are retained for five years.

Disposal is permitted only at waste disposal facilities that are intended for such purpose and approved by district environment authorities.

Packaging is handled according to Act No 529/2002 on packaging and amending certain laws, as amended.

Details of the handling and storage of plant protection products are set out in MoARD Decree No 491/2011 on the keeping of records on plant protection products and on the reporting of data, conditions and procedures for the storage and handling of plant protection products and the cleaning of used application equipment. Compliance with the provisions of the decree and their application in practice minimise the risk as much as possible. The area of proper handling and storage is part of training in accordance with Section 32 of the Act.

Professional users and distributors are required to handle plant protection products so as not to endanger human health or the environment. In particular, this concerns:

- a) the storage, handling, dilution and mixing of plant protection products,
- b) the handling of packaging and remnants of plant protection products,
- c) the disposal of mixtures from tanks after the application of plant protection products,
- d) the cleaning of the application equipment used.

Vendors must hold a certificate of professional competence and must provide complete advisory services, including drawing attention to the details on labels. Relevant information also includes proper storage, mixing, and minimisation of spraying residue and unused quantities of plant protection products, including proper disposal of empty packaging.

Action proposed

- a) to arrange regular information campaigns on the storage and disposal of plant protection products in order to raise awareness about the responsible handling of plant protection products,
- b) to publish a brochure that includes a section on the proper disposal of packaging and procedures to ensure the disposal of residues of plant protection products for professional and (in particular) non-professional users, and to ensure distribution thereof to the general public.

Responsible

MoARD, MoEnv, CCTIA.

Cooperating entity

SCPA

4.7. Application equipment for plant protection products and the inspection of such equipment

The correct application of plant protection products, along with training, is regarded by the MoARD as a key element and a main pillar for ensuring the safe use, and reducing the quantitative use, of plant protection products.

The obligation to carry out periodic controls of the application equipment in use was established in the Slovak Republic in 1995 by Act No 285/1995 on plant care, as amended, and was implemented in practice as of 1 January 2003. That law was superseded by Act No 193/2005 on plant care, as amended, but the obligations relating to the registration and control of application equipment remained unchanged. At present, under Act No 405/2011, the content, scope and frequency of the controls almost fully comply with the requirements laid down by Directive No 2009/128/EC. Even under the original Act No 285/1995, the performance of tasks related to the registration and control of application equipment was delegated to the Rovinka Agricultural Technical and Testing Institute (ATTI); this competence was retained in Act 405/2011 and it is implemented by the 13 test stations located in the Slovak Republic that are contractually commissioned by the ATTI.

All tests performed by the ATTI and the ATTI Testing Laboratory in the field of plant care are accredited in the SNAS and ILAC MRA system. The testing system established in 2003, including the frequency of controls on application equipment used for plant protection products, has proved to be effective and efficient.

4.7.1. Structural analysis in terms of the different types of application equipment and facilities in Slovakia

The term 'application equipment' means any apparatus specifically intended for the application of pesticides, including accessories that are essential for the effective operation of such equipment, such as nozzles, manometers, filters, strainers and cleaning devices for tanks. Depending on the method of application of plant protection products, application equipment is divided into:

1. application equipment for liquid mixtures, including sprayers for blanket land application, air-assisted sprayers intended to treat spatially-defined crops, aerial application equipment
2. application equipment for powdered or granular mixtures (spreaders, powder sprayers),
3. seed and plant dressing machinery (wet and dry techniques),
4. other equipment for pesticide application (equipment connected to trains, hand-held and knapsack application equipment, devices connected to seeders or planters).

In Slovak agriculture, the largest application equipment group comprises surface sprayers and air-assisted sprayers with a tractor, which, under the aggregation method, are broken down into mounted and towed (with their own axle or axles); the second largest group comprises self-propelled sprayers and air-assisted sprayers with their own chassis and engine unit.

Approximately 3 500 to 3 700 surface sprayers with a spray width of more than 12 metres and approximately 500 to 750 air-assisted sprayers are used professionally in the Slovak Republic. According to data obtained in inspections, 71% of surface sprayers were equipped with injection nozzles and 77% were equipped with impact nozzles with antidrift effect (a nozzle in at least one set in the case of turret holders) in the Slovak Republic in 2011 and 2012.

The system of air-supported application is mostly used with self-propelled surface sprayers, and less with towed sprayers. In relative terms, air-support sprayers account for a figure of approximately 4% to 5% in the Slovak Republic.

Approximately 75% to 80% of surface sprayers in the Slovak Republic with a spray width of more than 12 m are fitted with an electronic dosage control system.

A GPS assisted steering system is used in application equipment for treating crops in about 40% to 55% of devices via a free satellite system (EGNOS); charged systems are used sporadically (RTK, OMNI STAR).

Equipment for aerial application can be connected to 39 aircraft potentially eligible for this activity in the Slovak Republic.

For the detailed mapping of the quantity and structure of all existing application equipment in professional use in the Slovak Republic, Rovinka ATTI carries out ongoing stocktaking of such equipment based on its own documentation drawn up during inspections or based on documentation obtained by the CCTIA in its inspection activities at businesses in accordance with the National Plant Health Inspection Plan for individual calendar years.

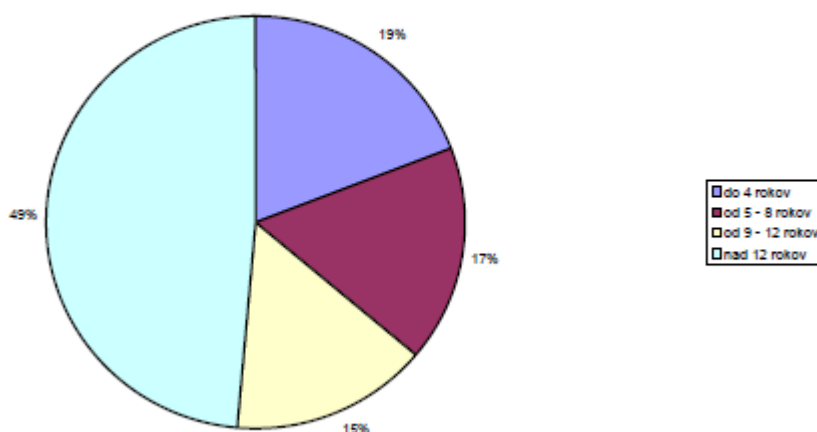
Age structure of application equipment in the Slovak Republic

The actual age structure of the pesticide application equipment in the Slovak Republic does not, in terms of the current technical state of the equipment, bode well for the future. The age structure assessment focuses on surface sprayers and air-assisted sprayers.

As at 31 August 2012, approximately 49% of application equipment was more than 12 years old; the length of the technical service life projected for these assets (8 years) is exceeded in 64% of machines in active use in agriculture in the Slovak Republic.

Age structure of application equipment (surface sprayers and air-assisted sprayers), total for the Slovak Republic as at 31 August 2012

Veková štruktúra aplikakačných zariadení (plošné postrekovače a rosiče) spolu v SR k 31.08.2012



- up to 4 years
- 5 to 8 years
- 9 to 12 years
- over 12 years

Graph 5

source: Rovinka ATTI

More than 2 500 items of application equipment are more than 8 years old. Optimal application parameters and a generally satisfactory technical condition can be achieved only by the **progressive shortening of service intervals** based on comprehensive diagnoses, carried out preferably during the periodic inspections conducted by authorised centres. The actual age structure of application equipment in the Slovak Republic was one of the reasons for setting the initial two-year intervals for the mandatory inspections. Act No 405/2011 extended the interval between inspections of application equipment to five years up to 2020, and three years thereafter. The first inspection of new application equipment following acquisition also comes after five years.

The five-year interval between inspections in the Slovak Republic is set very carelessly in view of the existing age structure of the application equipment and its operational workload (an average of 1 900–2 600 ha per year per surface sprayer), especially within Slovak agriculture, where the replacement rate for machinery and equipment as an asset is inadequate and the age structure of the existing application equipment has stagnated in the last 10-15 years, particularly in the age categories of over 8 and 12 years.

4.7.2. Inspection of equipment in use

The Slovak Republic launched inspections of application equipment in 2003, when the obligation was set for periodic inspections of the application equipment used professionally.

Compulsory inspections were established by law at two-year intervals starting from 1 January 2003 for surface sprayers and air-assisted sprayers, and from 1 June 2005 for aerial application equipment and seed dressers. Act No 405/2011 on plant care extended the interval between compulsory inspections of application equipment to five years up to 2020 and three years thereafter in accordance with the requirements of Directive 2009/128/EC of the European Parliament and of the Council.

Under the previous legislation, no different intervals were specified in relation to selected equipment for the practical performance of inspections in the Slovak Republic, nor were conditions specially defined for the operation of such equipment. A two-year inspection interval was applied across the board for precisely defined application equipment. Act No 405/2011 introduces the condition of inspections for devices mounted on trains, and hand-held and knapsack application equipment. Application equipment mounted on sowing and planting machinery was inspected within the category of surface sprayers.

Act No 405/2011 (Section 30(1) 'Application equipment for professional use shall be inspected within a time limit consistent with the intensity of use, but at least once every five years until 2020') *de jure* sets a condition for the application of different inspection intervals for the varying workloads of application equipment, but this is *de facto* unenforceable; neither the law nor the implementing regulation specifies conditions for assessing the workload of application equipment in relation to the inspection interval.

In inspections of application equipment, the functioning of the entire application equipment and its individual functional groups is checked in accordance with technical specifications prepared methodically for the process of inspecting, testing and evaluating the relevant parameters and the production of test results in the form of a report. The performance of inspections in the Slovak Republic is regulated by MoARD Decree No 489/2011 and by the 'ATTI Guideline on the Inspection of Application Equipment for Plant Protection', which fully applies the harmonised

standard STN EN 13790 Agricultural machinery. Sprayers. Inspection of sprayers in use, Part 1: Field crop sprayers, Part 2: Air-assisted sprayers for bush and tree crops.

Inspections of other types of application equipment are not yet covered by harmonised standards; in the future these will need to be drawn up and specified in accordance with Article 20 of Directive 98/34/EC of the European Parliament and of the Council.

Pesticide application equipment complying with the harmonised standards developed in accordance with Article 20(1) of the Directive shall be presumed to comply with the essential health and safety and environmental requirements.

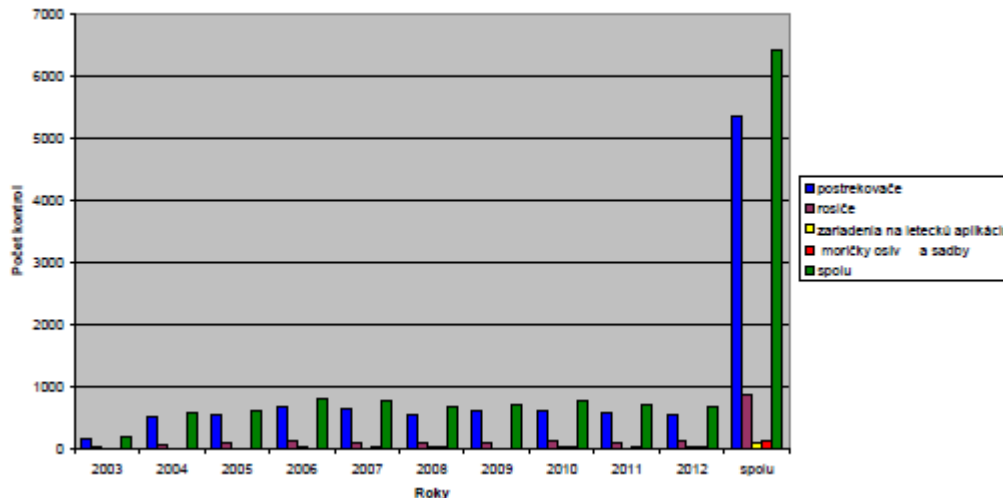
The teaching materials for the training of persons in the application of plant protection products include guidelines and procedures for the calibration of a surface sprayer and air-assisted sprayer, as well as guidelines for the optimal settings for uniformity of seed dressing and calibration of the dosage of seed dressing. The textbooks also contain guidelines for checking the technical condition of application equipment.

Table 2 Numbers of inspections of various types of application equipment (surface sprayers and air-assisted sprayers, equipment for aerial application, seed and plant dressers) carried out in the Slovak Republic from 2003 to 2012

Year	sprayers	air-assisted sprayers	equipment for aerial application	seed and plant dressers	total
2003	163	12	0	0	175
2004	519	44	0	0	563
2005	528	89	0	0	617
2006	658	110	22	0	790
2007	620	99	6	25	750
2008	546	96	19	15	676
2009	594	90	5	6	695
2010	591	129	14	18	752
2011	585	91	4	37	717
2012	531	113	12	25	681
total	5 335	873	82	126	6 416

Graph 6

Numbers of inspections of various types of application equipment (surface sprayers and air-assisted sprayers, equipment for aerial application, seed and plant dressers) carried out in the Slovak Republic from 2003 to 2012



Number of inspections

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	total
Years										

- sprayers
- air-assisted sprayers
- equipment for aerial application
- seed and plant dressers
- total

4.7.3 Hand-held and knapsack application equipment

Directive 2009/128/EC allows Member States to exempt hand-held pesticide application equipment or knapsack sprayers from inspection. In such cases, operators must be made aware of the need for regular maintenance and servicing, of the specific risks associated with these devices, and of the use of these devices by means of training in accordance with the Directive; arrangements must be made so that they are professionally trained in the proper use of these devices.

Directive 2009/128/EC of the European Parliament and of the Council allows Member States to apply different timetables and inspection intervals to hand-held pesticide application equipment or knapsack sprayers.

Current Slovak legislation does not exempt hand-held and knapsack sprayers from inspection, i.e. it practically establishes an obligation for periodic inspections at five-year intervals. No varying intervals or timetables are applied in this respect.

Inspections and the settings of application equipment comprise one of the areas of training. A separate section is devoted to hand-held and knapsack application equipment with a focus on safe use, proper settings and cleaning.

4.7.4. Measures to reduce the risks to human health and the environment in the application of pesticides

- ensure the implementation of good plant protection practice by means of targeted training and effective checks on professional users,
- include information on application equipment in the advice system,
- minimise drift during the application of plant protection products, which can be ensured by regular maintenance of existing application equipment and by promoting the purchase of new high-quality application equipment fitted or equipped with anti-drift features – funds for this are available in Axis 1, Measure 1.1. (Modernisation of agricultural holdings) of the RDP 2007–2013,
- arrange for and promote objective advice from certified advisers in the field of low-drift technology (across the world today, more than 2 000 types of application nozzles are available as 'low-drift' devices, making it impossible for ordinary application equipment operators to fully grasp this range without objective expert advice),
- in the future, a rational way out of this situation would be to draw up (globally or regionally) a uniform classification of nozzles with an exact assignment of their use for a specific product (fungicide, herbicide, insecticide, growth regulator, liquid fertiliser) and for a specific crop at different growth stages; this could form a rational basis for tackling problems associated with the correct selection of anti-drift nozzles,
- completion of the methodology for inspections of application equipment mounted on tractors, as well as hand-held and knapsack application equipment,
- promotion, in the form of supplementary training, of particular application techniques for specific conditions (special low-tonnage crops, treatment in rugged terrain, integrated protection, etc.). These specific application techniques may include the air-assisted application of products, application by means of integrated systems for precision agriculture, an assisted steering system (e.g. GPS), the application of products in protection zones (water sources, watercourses, protected structures, sites), and application using technically adapted application equipment (shields, deflectors),
- inspections of professionally used application equipment at the optimal time, to ensure that the application equipment used is fit for use without placing an excessive burden on the environment and without having a negative impact on the efficacy of plant protection products, while guaranteeing their correct dosage and distribution in the target area,
- increased use of mobile devices for rinsing empty packaging,
- increased inspections of the mixing devices of application equipment.

Action proposed

- a) to include application equipment in the voluntary training system for non-professional users, expand lectures to incorporate practical examples for this target group (gardeners, amateur growers),
- b) to re-enact the introduction of intervals of two-years or a maximum of three-years between inspections and the testing of application equipment in view of
 - the unsatisfactory age structure of most of the application equipment in use in the Slovak Republic,
 - the disproportionately higher intensity of use of application equipment in the Slovak Republic compared to other Member States and compared to manufacturers' recommendations,

- c) arrange for the more frequent servicing of application equipment, which is performed by the Rovinka ATTI as part of the inspections of application equipment, thus ensuring the safe operation thereof and the precisely targeted application of products without placing an undue burden on the environment and non-target areas and organisms,
- d) retain the obligation to test hand-held, knapsack and little-used application equipment.

Responsible

MoARD, ATTI, CCTIA.

Cooperating entities:

network of ATTI inspection stations

4.8. Aerial application

According to Article 9 of Directive 2009/128/EC, aerial spraying is generally banned as a method that has the potential to cause substantial adverse effects on human health and the environment, in particular from spray drift. It is permitted in exceptional cases where there are no acceptable alternatives and where aerial spraying offers clear advantages over land-based application.

In the Slovak Republic, the aerial application of products is covered by Section 31 of Act No 405/2011. As aerial application is the only alternative in some circumstances, the options for the potential use thereof are set out by Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No 490/2011 laying down detailed conditions, requirements and procedures for the implementation of provisions on the aerial application of plant protection products and on requests for permission for aerial application. The cases where it is possible to request aerial application are as follows:

- the need for rapid treatment of large areas due to a plague of pests,
- treatment of large areas of permanent crops – fruit orchards, vineyards, forests,
- treatment of vegetation where the use of ground equipment might cause major economic damage (sunflower or rape desiccation),
- common agricultural crops which cannot be treated on the ground within the time limit required by the agricultural technique due to bad weather conditions (e.g. persistent rainfall and heavily waterlogged soil), with the aim of saving the vegetation,
- treatment of vegetation in remote and difficult-to-access sites.

In terms of the possible aerial application of products in the Slovak Republic under Act No 543/2002 on nature and landscape protection, as amended, there are two categories of land and vegetation:

- sites with first-level protection, where permits are issued by the CCTIA,
- sites with second-level protection (for an area of more than 2 ha) and third-level protection (regardless of area), where permits are issued by district environment authorities.

At the fourth and fifth protection levels, **all application of plant protection products is prohibited.**

For aerial application, it is possible to use plant protection products referred to in the List of Authorised Plant Protection Products provided in the 'aerial application' section or other authorised plant protection products classified as Z4 (the risk arising from use of the product in compliance with the prescribed dose or concentration is acceptable for domestic livestock and wildlife), VC3 (the risk arising from use of the product in compliance with the prescribed dose or concentration is acceptable for bees), Vo3 (slightly toxic for fish and other aquatic animals), VO4

(the risk arising from use of the product in compliance with the prescribed dose or concentration is acceptable for fish and other aquatic animals) and products meeting the conditions of use under MoARD Decree No 488/2011 laying down details of principles and measures to protect human health, drinking water sources, bees, animals, water and other non-target organisms, the environment and specific areas in the use of plant protection products.

Products which comprise systemic glyphosate-based herbicides and other products which have aerial application expressly prohibited in their labelling are excluded from the possibility of aerial application.

Decisions on permission for aerial application include measures to ensure that aerial application has no adverse effects on human health, animal health or the environment.

Plant protection products may be applied aurally only by a professional user who holds a certificate of professional competence in the field of plant protection products and is professionally competent under Act No 143/1998 on civil aviation (the Aviation Act) and amending certain laws, as amended; the application equipment must have a certificate of inspection pursuant to Section 30(6) of Act No 405/2011.

Aerial application is one of the topics of the training in the field of plant protection products which is mandatory under Section 32 of Act No 405/2011 on plant care.

Action proposed

- a) to finalise the procedure for the classification of plant protection products suitable for aerial application in terms of individual risks,
- b) to assess individually each request submitted; this is a prerequisite for the safe use of plant protection products by means of aerial application,
- c) to enact shorter intervals between inspections of application equipment in view of the fact that the inspection of application equipment is a prerequisite for proper functioning of such equipment,
- d) to invest in the most advanced spraying technology in order to reduce spray drift,
- e) to organise checks on aerial application in practice immediately before or directly during such application (wind conditions, spray mixing, safety at work, checking the testing of the application equipment, etc.),
- f) to ensure adequate and objective general public awareness of periodically recurrent spraying (e.g. in cases of the destructive spread of forest pests), including detailed information on specific treatments in the area, with an indication of the active substance, the places and dates of spraying, and the way in which the active substance acts on harmful organisms and non-target organisms,
- g) to ensure the proper monitoring and evaluation of permits and the performance of aerial application.

Responsible

MoEnv, SNC, CCTIA, NFC.

Cooperating entity

SCPA

4.9. Integrated pest management

Integrated plant protection against harmful organisms (hereinafter 'integrated pest management') can be defined as a method of protecting plants where all economically,

ecologically and toxicologically interchangeable methods are used to keep harmful organisms below the economic damage threshold. Integrated pest management is governed by stricter rules than the protection of plants from harmful organisms that is used in conventional production. However, requirements for integrated pest management fall short of the standards of organic agriculture.

Integrated pest management is a broader term encompassing economic and controlled cultivation in a comprehensive manner which favours ecologically/agri-environmentally safer practices, minimising unwanted side effects by reducing the number of treatments with plant protection products, and optimal fertilisation, including any other interference in the agroecosystem, thereby reducing the burden on the environment and the negative impact on non-target organisms. Indirectly, this also assumes that production will be healthier, and thus will also protect human health. At present, integrated pest management is being implemented gradually, with a target year of 2014, as of which it will have to be applied to all crops and by all farmers. Only general principles of integrated pest management are set out for practical use. The more specific and detailed rules below take the form of voluntary guidelines.

Directive 2009/128/EC requires that the general principles of integrated pest management (Annex III to the Directive) be implemented by all professional users by 1 January 2014. Professional farmers must use plant protection methods that pose the least risk to human health and the environment. Integrated pest management is based on four multi-tiered approaches: prevention, monitoring and identification (observation), determination of the level of threat and actual regulation by suitable means. Integrated pest management is actually a decision-making process in relation to protection against harmful organisms. The process should take into account or focus on the following key areas:

- 1) The selection and combination of compatible methods of plant protection.
- 2) The selection of control measures, which should be based on the use of qualified advisers, observations in the field, the use of forecasting methods or signalling, the use of pest threshold levels, and so on.
- 3) Integrated pest management takes into account the benefits of using a particular selected range of plant protection products with regard to farmers, society and the environment. The specific effective regulation of the range and quantity (regulation of the reuse of products) of products used is undoubtedly economically beneficial in this regard, but integrated pest management also has advantages which are not easily quantifiable in financial terms, such as a reduction in the burden on the environment caused by plant protection products, better working conditions, improved quality of the final product due to the reduction in the burden caused by plant protection products, etc. Ultimately, the market price of products thus produced may be advantageous, as customers place greater value on products produced in integrated pest management systems or integrated production systems.
- 4) The integrated pest management system protects specific vegetation with respect to the biotic community at the site; the focus here is on the different types of harmful organisms, protecting beneficial organisms and facilitating natural biological pest control.

The current state of integrated pest management in the Slovak Republic

Integrated pest management in the Slovak Republic is a new method of cultivation. The IPROVIN Association (Association for the Integrated Production of Grapes and Wine) introduced the use of this method for its members (vintners) back in 2000 without seeking any additional subsidy from the state. After its integration into the Agri-environmental Measures of the Rural Development Programme for the years 2007 to 2013, integrated pest management as part of the

subsidised integrated production system was also extended to fruits and vegetables. This increased the areas of crops grown in the integrated system and the crop range. The producer associations Association of Integrated Fruit Production and Association of Integrated Vegetable Production have been set up, applying the principles of integrated pest management.

The benefits of integrated pest management in terms of reductions in the consumption of plant protection products or changes to the range of active substances used are not being monitored on a long-term or systematic basis.

Principles of integrated pest management

Integrated pest management is not just a list of authorised products, but also includes a preference for non-chemical methods of plant protection. Over the last 20 to 30 years, mechanical inputs into the soil have considerably decreased and the number of crops grown has narrowed; prevention is generally underestimated and there is a tendency to apply chemical solutions when addressing the health of crops. The main measures of integrated pest management include precautionary measures, the protection and promotion of beneficial organisms, the monitoring of harmful organisms, the prioritisation of sustainable biological, physical and other non-chemical methods, the selection of products that are as specific as possible to the target species with a minimum of side effects on human health, non-target organisms and the environment, the use of products at the required level, and checks on the success of the measures used.

Precautionary measures

- crop rotation – classic crop rotation ‘cereal – leguminous plant (root crop) – cereal – animal feed’ is applied less nowadays, but a procedure as close as possible to this should be followed. In this context, it is necessary to have a clear, stable and sustainable production plan, an analysis of the land cultivated in terms of its potential and the areas of the plots of land and the largest possible number of main and secondary crops, including catch crops; a multiannual sowing procedure should be drawn up that respects soil fertility, the availability of irrigation, and, especially, optimal crop rotation, while land blocks should split into smaller plots in order to stabilise the area of each crop over several years.
- Properly integrated agritechnical measures have a significant positive impact on weed control, soil moisture management, and on biological life in the soil. This is a more expensive, but definitely more natural way of farming. If the grower uses a system of minimum soil processing, or a plough-less system, the traditional method of soil processing may be used in some years, where necessary. Agritechnical measures include the determination of the right sowing time, the optimal application rate, and the use of under-sowing to establish perennial forage growth. Seed treatment for pest and disease control purposes entails the targeted protection of plants against diseases and pests during germination and during the first weeks of vegetation.
- The use of resistant or tolerant varieties and standard or certified seed and planting material is a cheap, accessible and effective means of pest control. Besides economic and market factors, the selection of a variety must take into account the best possible health and resistance to disease and pests. In justified cases, resistant or tolerant varieties should be used, excluding genetically modified varieties. When using farm-saved seed, it is necessary to take into account the subsequent spread of harmful organisms and possibly limit its use in future years.
- Balanced fertilisation and liming ensures the optimal intake of nutrients and provides balanced and durable growth. Nutrient imbalance may cause susceptibility to fungal

diseases. Over-fertilisation with nitrogen is generally detrimental to the healthy development of plants. Fertilisation with organic fertilisers is essential to maintaining the good physical and chemical properties of the soil, thus supporting the utility value of all the fertilisers supplied. Soil acidity should be regulated by liming for optimal access to all available nutrients. The supply of fertiliser should be regulated on the basis of soil analyses and the yields reported. Micronutrient fertilisation can significantly improve the utility value of other nutrients and overall production potential.

- Irrigation or drainage and the establishment of an optimal water regime is a prerequisite for achieving stable yields. Irrigation of intensive crops should, if necessary, be combined with the more intensive processing of soil, especially after harvesting, in order to maintain a favourable soil structure. Any drainage should be carried out very carefully; it would be wise to classify such land as non-production agricultural land.

Protecting and promoting beneficial organisms is the most important and most effective element of the change in the perception of plant production compared to conventional farming. Whenever the commercial use of beneficial organisms is available, they should be applied gradually in practice. However, a more efficient method is to encourage them and not to destroy them within the agroecosystem, i.e. to encourage the preservation of biodiversity. After incorporating them into an overall system of agricultural nature management and plant cultivation, their protective potential for pest control can be harnessed without incurring additional costs. In practice, this mainly affects vines and orchards, and to a lesser extent vegetables. In justified cases, it is necessary to make greater use of mulching. When selecting products, the minimum negative impact on beneficial organisms should be taken into account as one of the most important factors.

The monitoring of harmful organisms should be standard procedure for any producer. The incidence and intensity of harmful organisms is not the same every year or in the same parts of the Slovak Republic. Without the use of available methods and apparatus for observations in the field, including the monitoring of the species composition of weeds, targeted protection with chemical plant protection products is impossible. Use should be made of developed signalling methods and impartial advice. Treatment against harmful organisms should be managed on the basis of threshold levels, which must be scientifically substantiated and determined by scientific institutions.

Based on the monitoring of harmful organisms, **farmers decide** whether and when to apply plant protection measures along with the right choice of product in accordance with the actual threat to the crop. For harmful organisms, the threshold levels defined for regions, specific areas, crops and particular climatic conditions must be taken into account.

Another of the main principles of integrated pest management is the **prioritisation of sustainable biological, physical and other non-chemical methods** instead of chemical pest control methods. Chemical protection is usually a cheaper and faster measure, but when protecting against harmful organisms it is necessary to take into account factors other than financial issues. The use of biological products requires accurate information, and it is therefore necessary in such cases to make more use of advice.

When **selecting products as specific as possible to the target pest with minimal side effects on human health, non-target organisms and the environment**, it is necessary, in addition to the compulsory restrictions listed on the label, to take account of potential threats posed to product applicators, and to consider beneficial organisms and, in particular, the impact on ground and surface water. In practice, it is therefore necessary to prioritise processes and products with the lowest risk to human health and the environment from among the products available to tackle a given pest problem, e.g. to limit the broad-spectrum insecticides and replace them with species- or group-specific products. To minimise the risks to human health (residues

in production), it is recommended to make use of the information on product degradation that can be found in the safety data sheet.

The **use of products only to the extent required**, e.g. by reducing dosage, cutting down on the frequency of application or engaging in partial application, is a factor that contributes significantly to the achievement of integrated pest management objectives. Therefore, in practice, in justified cases where the infectiousness of a disease is lower or where the number of pests is lower, it is recommended that the lower limit of product dosage be used, that early intervention at the outer edges of crops take place to combat pests encroaching from surrounding vegetation in connection with regular field observations, that the interval between treatments be extended accordingly where the infectiousness of diseases is low or virtually negligible, that product drifting be prevented by using anti-drift spray technology, including compliance with protective strips alongside water sources, that the mechanisation of precision farming be used, and that, after an evaluation of the benefits and risks, use of wetting agents be maximised.

Where the risk of pest resistance is known and where the level of harmful organisms requires the repeated application of products, available **anti-resistance strategies** should be applied to maintain the effectiveness of the products. Cross-resistance in the case of active substances from the same chemical group must be addressed by using a product with a different effective mechanism, or at least a product with an active substance from a different chemical group. Known and confirmed resistance in populations of harmful organisms in the Slovak Republic should be respected.

In the implementation of integrated pest management, the performance of **checks on the success of measures applied**, based on the use of records of products used and on the monitoring of harmful organisms, should be a matter of course. The records that are mandatory under the law should be expanded to include monitoring of harmful organisms before and after treatment, the threshold levels applied, the method of forecasting and signalling used, the crop yields and estimated losses in terms of the quantity and quality of crops. Such records must result in the avoidance of mistakes stemming from undue interference in the previous period, and in the selection of the most appropriate solutions in the future.

The application of integrated pest management includes the creation of lists of authorised plant protection products. Worldwide, there are a number of optional, but scientifically-based schemes and conditions for the preparation of such lists. In the Slovak Republic, integrated pest management for the RDP 2007–2013 has relied on the introduction of the principles of the IOBC (International Organisation for Biological and Integrated Control of Noxious Animals and Plants, www.iobc.ch). Basic general requirements for all crops are expressed in the form of ‘minimum mandatory requirements’; recommendations are set for them as optional solutions to improve the overall system. Special crop guidelines form an extension to the general instructions. Some of these rules will also be used to create principles for the cultivation of crops – ‘crop guidelines’ for all crops, encompassing site selection, sowing (planting), harvesting and storage. **These guidelines will be voluntary.**

The result of all these efforts should be a customer/consumer for whom **quality is on the ‘inside’, not on the ‘surface’ of products**. The final effect should be reflected in the form of foods with a lower quantity of plant protection product residues. However, to this end it is necessary to intensify supervision of the content of residues in food of plant origin, especially fresh produce sold directly to the customer without any treatment.

Integrated pest management includes training in the field of plant protection products with a focus on the general conditions above.

Action proposed

- a) to establish a methodology for integrated pest management for each group of crops and their specific requirements in terms of the application of integrated pest management, focusing on proposals to change the current system of crop cultivation towards a system 'balanced for plant protection'. This methodology (the 'crop manuals') must be drawn up and validated by research organisations as a matter of priority, be created on the basis of real economic and other objective crop-growing conditions in the Slovak Republic, be as simple as possible, controllable and flexible, and be peer-reviewed in particular by growing-association representatives prior to official publication,
- b) to expand the training system in the field of plant protection products to include crop manuals,
- c) to ensure the continuity of the information provided on integrated pest management by means of appropriate publication on the Internet with the relevant promotion of integrated pest management and recommendations in the form of printed publications,
- d) to arrange for an objective assessment of the benefits and drawbacks of minimisation technologies, including in economic terms,
- e) to extend the independent advice system to include details of biological and integrated pest management and integrated production from 1 January 2014 and to use EU funds to finance the system,
- f) to encourage easier farmer access to biological products based on natural substances that enhance the natural resistance of crops and products intended for the monitoring of harmful organisms (pheromone, optic, alcohol and water traps, sticky boards, equipment to swat pests, etc.). This also includes the promotion of such products,
- g) to create a simple control system in respect of compliance with the general principles of integrated plant protection,
- h) to maintain separate subsidy opportunities for integrated production and organic farming,
- i) to support research projects on biological pest control, determine the resistance of harmful organisms, draw up methods for the evaluation and monitoring thereof, develop new environmental best practices for farmers in different geographical and climatic conditions, promote the domestic breeding of resistant varieties and support Slovak entities in the organisation of mandatory testing of the resistance of newly cultivated varieties. Another reason to support domestic breeding is the fact that in the process of breeding, varieties grown in specific climates are, to some degree, naturally resistant to pressure from the harmful organisms that regularly occur in that area and therefore do not require the same interventions against such organisms as varieties not adapted to our climatic and soil conditions.

Responsible

CCTIA PPRC – the production of crop methodologies for integrated pest management, independent signalling, the production of informative and promotional documents, projects for control of the resistance of harmful organisms and for the monitoring thereof.

MoARD – approval of methodologies for integrated pest management.

SUA – scientific papers and diploma theses focused on signalling and alternative methods of plant protection, and on the implementation of projects to control the resistance of harmful organisms and their monitoring.

Cooperating entities:

Producer associations and the Association of Agri-entrepreneurs of the Slovak Republic regarding the drawing up of methodologies for integrated pest management and integrated

production and their adaptation to the agro-ecological and production conditions of the Slovak Republic, and regarding the organisation of seminars on various groups of crops.

4.10. Indicators

There are no harmonised risk indicators under European legislation, but it is possible for Member States to continue using existing national indicators or to adopt other appropriate indicators. Each Member State shall:

- a) calculate its own risk indicators by using statistical data collected in accordance with legislation concerning statistics on plant protection products together with other relevant data;
- b) identify trends in the use of certain active substances;
- c) identify priority items, such as active substances, crops, regions or practices, that require particular attention or good practices that can be used as examples in order to achieve the objectives of reducing the risks and impacts of pesticide use on human health and the environment and encouraging the development and introduction of integrated pest management and of alternative approaches or techniques in order to reduce dependency on the use of pesticides.

Efforts to reduce risks can be quantified by monitoring the indicators that can be monitored. However, substantial progress in risk reduction is possible in the EU only in a harmonised approach, which is still missing. According to the legislation concerning statistics on pesticides, the first reference year for sales data is 2011, while the reference period for data on consumption in agriculture is 2010–2014, with reporting one year later, i.e. in 2012 for sales and in 2015 for consumption. Only then will it be possible for objective comparisons of sales and consumption to be carried out at EU level, on the basis of which the environmental impact can then be analysed. Data collection is the responsibility of the CCTIA; the results are published on the website at www.uksup.sk.

Considering the volume and high quality of groundwater in the Slovak Republic, which constitutes a significant reservoir of drinking water both at present and for the future, we believe that special-purpose monitoring of residues in drinking water offers an important indicator of the reduced risks resulting from use of plant protection products. The effectiveness of measures under the National Action Plan can be assessed and evaluated by reference to the results of this monitoring.

EU legislation regulates the levels of pesticide residues in food by means of a system of maximum residue limits (MRL). Monitoring, conducted in the Slovak Republic by the SVFA, is a way of objectively determining the situation in pesticide residues. The other responsible authorities involved in pesticide residues in the Slovak Republic include:

- UVMP (non-target organisms, vertebrates),
- NTIC – human medicine,
- SVFA – monitoring of residues in food,
- PPRC – study of the impact of pesticides in crop production,
- APRC – impact on bees,
- SUA – scientific assessments,
- PHA – MRL settings in the authorisation process.

Statistics on the volume of plant protection product consumption

Data on the volume of plant protection products consumed in the Slovak Republic were already recorded under the previous legislation. At present, records of data on consumption are

legislatively enshrined in Act No 405/2011 and Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC; record-keeping details and specimen forms are provided in the MoARD Decree No 491/2011 on the keeping of records on plant protection products and on the reporting of data, conditions and procedures for the storage and handling of plant protection products and the cleaning of used application equipment. The body responsible for the collection of data is the CCTIA.

Table 3: Consumption of plant protection products in the Slovak Republic on agricultural land between 2002 and 2007. Source: CCTIA

year	kg/ha of active substance	kg/ha of product
2002	1.19	2.36
2003	1.04	2.04
2004	1.08	2.29
2005	1.10	2.42
2006	1.22	2.59
2007	1.21	2.62
2008	0.97	2.29
2009	1.14	2.50
2010	1.31	3.08
2011	1.00	2.41
Average	1.13	2.46

According to the figures in the above table, approximately 2.46 kg/ha of plant protection products, or 1.13 kg/ha of active substances, are used in the Slovak Republic annually, mainly on arable land. Although the Slovak statistics on plant protection product consumption are comprehensive, according to the Ministry of Agriculture and Rural Development the indicator of plant protection product consumption is not regarded as a sole or ideal indicator for measuring and implementing measures that aim to reduce the risks from the use of plant protection products, as factors related to an applied product also include the soil, soil moisture, air humidity, the actual application rate, and other factors.

Harmonised statistical data can contribute to more accurate targeted measures to reduce the risks from the use of plant protection products.

Besides the volume of sales or consumption of plant protection products, the risk indicator also takes into account data on individual plant protection products, persistence in the soil, bioaccumulation, toxicity to aquatic organisms and groundwater, etc. One drawback is that the products that result from the decomposition of plant protection products are not treated as an indicator of risk, even though the degradation products may be more dangerous to the environment than the actual active substance.

Indicators deemed appropriate by the Slovak Republic for ensuring that their application can realistically be expected to reduce the risks arising from pesticide use are as follows:

- monitoring of plant consumption,
- monitoring of residues in food and also throughout the entire food chain (animal feed and animal products),
- analysis of the impact on people and all components of the environment,
- monitoring of the consumption of products according to their classification from the perspective of bee protection,

- special-purpose monitoring of residues of plant protection products in drinking water reservoirs,
- the intensity of controls resulting from the application of national and EU legislation concerning plant protection products and their results may be another measurable indicator for achieving the objectives of the National Action Plan.

Additional funds will be required for the establishment of the system and the periodic evaluation of indicators by the organisations concerned.

Action proposed

As harmonised statistics can contribute to more accurate targeted measures to reduce the risks of the use of plant protection products on the one hand, and on the other hand can provide an objective view of the prudent use of products in practice, we propose implementing the following measures:

- to create a database of the consumption of plant protection products and active substances and to publish these,
- to create national indicators of risk with a reference period of 2007 -2011 and to ensure their implementation in practice in the Slovak Republic,
- to draw up methodological guidelines for the use of plant protection products in relation to water in protected water management areas, in drinking water protection zones, in vulnerable areas, in protected areas (wetlands), etc.,
- to maintain a system for publishing the findings of official controls carried out by the CCTIA, SVFA, PHA, SHMI and WRI, summarising the findings of controls on plant protection products, the results in respect of residues of plant protection products in food of plant origin and the results in respect of water monitoring,
- to continue to monitor pesticide residues.

Responsible

CCTIA, SVFA, SSO, MoARD, PPRC, APRC, SNC, UVMP, WRI, SHMI.

5. Cost of proposed measures and key tasks

This National Action Plan is the first of its kind drawn up in the Slovak Republic. It does not provide accurate information on the potential actual costs of the measures that it would be advisable to apply in practice in the field of plant protection products. Measures and tasks outlined in the National Action Plan are oriented so that they are effective, and also so that their application does not place a financial burden on central government administration or on users of plant protection products. **Several tasks in the NAP may be carried out within the scope of normal official duties, and thus will not require direct expense from the state** (e.g. training, advisory activities and statistics).

Other measures and key tasks, such as adequate or more intensive environmental monitoring in relation to plant protection products (surface water and groundwater, non-target organisms, soil, etc.), will generate costs, and therefore these areas will require special funding projects. Nor should we lose sight of human resources at a time of constant downsizing in central government administration, when most employees are at their workload limits.

The National Action Plan will be implemented **within the spending limits of central government authorities and state organisations fully or partly funded from the public purse**. Part of the cost of implementing the NAP, especially in the application of integrated pest management as part of the integrated production system, may, if the relevant measure is included in a support area, be covered by measures under the Rural Development Programme

for the period 2014–2020, which anticipates financial compensation to farmers for all or part of their additional costs and loss of profit due to potential reductions in the volume of production as a result of commitments made.

The Slovak Republic must support the co-financing of activities related to the protection of human and animal health and the environment in the form of action that will reduce the risks arising from the use of plant protection products, through the use, among other things, of resources that are facilitated or provided by certain measures under the Rural Development Programme, and other resources provided by the European Union through projects.

6. Fines and penalties

Fines and penalties for violations of regulations on the use of plant protection products are laid down by Act No 405/2011 on plant care and amending Act No 145/1995 on administrative fees, as amended, and the provisions of other laws relating to areas covered by the National Action Plan.

7. Conclusions, reporting to the EU and Member States

The implementation of the national measures and tasks proposed under this National Action Plan will be assessed annually by the MoARD in cooperation with the competent organisations. A working group will be set up at the MoARD for the purposes of effective performance of the tasks under the National Action Plan and the evaluation of compliance therewith.

An evaluation of activities performed in the Slovak Republic under the National Action Plan will be sent to the European Commission at five-year intervals. The evaluation of the measures applied will form the basis for updates of the National Action Plan where necessary.

8. List of abbreviations

PPRC	Plant Production Research Centre
APRC	Animal Production Research Centre
EC	European Community
EU	European Union
EAPCCT	European Association of Poisons Centres and Clinical Toxicologists
EFSA	European Food Safety Authority
IOBC	International Organisation for Biological and Integrated Control of Noxious Animals and Plants
IPROVIN	Association for the Integrated Production of Grapes and Wine
SDS	Safety data sheet
FoM CU	Faculty of Medicine, Comenius University
LPIS	Land Parcel Identification System
MoARD	Ministry of Agriculture and Rural Development of the Slovak Republic
MoEnv	Ministry of the Environment of the Slovak Republic
MoH	Ministry of Health of the Slovak Republic
MoESRS	Ministry of Education, Science, Research and Sport of the Slovak Republic
NFC	National Forest Centre
NRL	National reference laboratory
NC SR	National Council of the Slovak Republic
NTIC	National Toxicological Information Centre

OLD	Department of Laboratory Diagnostics, the Rapid Alert System and Certification
OOR	Department of Plant Protection
ORP	Department of Pesticide Registration
OŽPaEP	Department of the Environment and Organic Farming
PZ	Protection zone
SPZ	Sanitary protection zone
RDP	Rural Development Programme
RASFF	Rapid Alert System for Food and Feed
RVFA	Regional Veterinary and Food Administration
RPHA	Regional Public Health Authority of the Slovak Republic
SUA	Slovak University of Agriculture
SCPA	Slovak Crop Protection Association
SNC	State Nature Conservancy of the Slovak Republic
SVFA	State Veterinary and Food Administration of the Slovak Republic
SHMI	Slovak Hydrometeorological Institute
ATTI	Agricultural Testing and Research Institute
FRI	Food Research Institute
UVMP	University of Veterinary Medicine and Pharmacy
CCTIA	Central Controlling and Testing Institute in Agriculture, Bratislava
PHA	Public Health Authority of the Slovak Republic
WRI	Water Research Institute
WHO	World Health Organisation