

**NATIONAL ACTION PLAN
FOR THE
SUSTAINABLE USE OF
PLANT PROTECTION PRODUCTS**

– NATIONAL CONTEXT OF THE USE OF
PLANT PROTECTION PRODUCTS –
(VOLUME II)

Lisbon 2013

**MINISTÉRIO DA AGRICULTURA, DO MAR, DO AMBIENTE E DO
ORDENAMENTO DO TERRITÓRIO**

[MINISTRY FOR AGRICULTURE, THE SEA, THE ENVIRONMENT AND REGIONAL
PLANNING]

DIREÇÃO-GERAL DE ALIMENTAÇÃO E VETERINÁRIA

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I. Introduction

The placing on the market and sale of plant protection products in Europe is heavily regulated by a framework of harmonised rules which seek to ensure a high level of protection of both human and animal health and the environment and at the same time to safeguard the competitiveness of EU agriculture. These principles have been adopted since 1991, following publication of Directive 91/414/EEC concerning the placing of plant protection products on the market.

The use of plant protection products can provide significant benefits to society by increasing the availability of high-quality food at reasonable prices. Due to their nature, however, these products may be prejudicial to living organisms since there are risks associated with their use. These risks must be accurately assessed and appropriate measures to minimise them must be defined.

Innovative EU legislation on plant protection products, commonly known as the ‘Pesticides Package’, has recently been published. Directive 2009/128/EC was accompanied by Regulation (EC) No 1107/2009, which tightened the requirements for protecting human and animal health and the environment and improved the functioning of the internal market. This was achieved by harmonising the rules on placing plant protection products on the market and reinforcing them according to the precautionary principle to ensure that active substances or products placed on the market do not have any harmful effect on human or animal health or the environment.

With the purpose of producing statistical data allowing Member States and the EU as a whole to monitor the situation and its development at all times, Regulation (EC) No 1185/2009 concerning statistics on plant protection products was also published in 2009.

Directive 2009/128/EC, which requires Member States to present National Action Plans on the sustainable use of plant protection products to the European Commission, establishes obligations in various areas and gives each Member State a degree of freedom to implement them according to national circumstances under the principle of subsidiarity. While always seeking to protect human health and the environment, the Directive encompasses the conditions of sale of plant protection products, the proper operation of application equipment, aerial applications, specific measures to protect water resources, applications in specific areas, handling, storage and treatment of packaging waste and surpluses and the extension to all professional users of the adoption of integrated pest management principles. Particular attention is paid on a cross-cutting basis to training professional users and providing information to and raising the awareness of the general public. Despite the Directive’s broad context and the legal framework it establishes, Law No 26/2013 of 11 April 2013 was recently published to regulate the distribution, sale and application of plant protection products for professional use and adjuvants of plant protection products and to define the procedures for monitoring the use of such products. This Law, together with Decree Law No 86/2010 of 15 July 2010, transposes Directive 2009/128/EC and thus represents the new legal framework governing the sale and use of plant protection products.

This volume (Volume II) outlines the current situation regarding the use of plant protection products in the light of the realities of national agriculture, identifies relevant legislation in a variety of areas relating to the sustainable use of such products and summarises action taken prior to publication of the Directive. This approach has highlighted the need for action, which is reflected in the strategy developed in Volume I.

II. Use of Plant Protection Products in National Agroforestry

2.1. Social profile

According to the Agricultural Census (INE, 2009), the family agricultural population, formed by agricultural producers and members of their household, whether they have worked on the respective holdings or not, involves 793 000 people, representing around 7% of Portugal's resident population.

The rural population aged considerably from 1999 to 2009, rising from an average of 46 years of age to 52 years of age. The number of people of 65 years of age or over accounted for one third of the population concerned in 2009, over 9% more than in 1999.

The level of education of the family agricultural population is very low: 40% of those concerned only attended the first cycle, while 22% have not had any education. Despite these indicators, however, significant improvements were recorded in the 10 years under study, during which the illiteracy rate fell by 7% and enrolment in secondary and higher education increased by 3%.

Agricultural producers continued to be predominantly men, though women now represent around one third, 8% more than in 1999. The average age of agricultural producers is around 63, 11 years more than the agricultural population in general. An analysis of the respective age structure shows that only 2% are under 35 years of age, while almost half (48%) are over 65 years of age.

The level of education of producers is low, 22% having had no education at all, while the majority have only completed the first cycle. A mere 8% of agricultural producers have completed secondary or post-secondary education, and of these just half have completed higher education. There is virtually no illiteracy among producers under 35 years of age, more than one third of whom have completed secondary or higher education, while illiteracy is still very common among producers over 65 years of age. The standard profile of the Portuguese agricultural producer is a 63-year-old male who has only completed the first cycle of basic education, who has had exclusively practical agricultural training and who performs agricultural activities on the holding for around 22 hours per week.

This summary description of the Portuguese agricultural population shows that due to its ageing and low level of education, coupled with little or no specific training, intense awareness-raising and training is required if the objectives of Law No 26/2013 are to be achieved.

2.2. Development of utilised agricultural area (UAA) and type of holdings

According to the Agricultural Statistics (INE 2010), in 2009 the UAA represented an area of 3 668 145 ha with a total of 303 867 holdings. The comparative figures for 1999 were 3 863 894 ha and 412 612 holdings. It was more common for smaller holdings to go out of business: 41% of small-scale holdings of less than 1 ha UAA ceased to operate, compared to 24% of holdings of between 1 and 5 ha UAA. By contrast, the number of holdings of over 100 ha UAA increased by around 6%. Abandonment of UAA was largest in regions in the centre of the country (Beira Litoral, Beira Interior and Ribatejo e Oeste) and in Algarve. The heterogeneous nature of national agriculture is illustrated by the wide variability in the size of holdings, highlighted by the limited number of large-scale holdings of over 1 000 ha (266),

operating on 12% of the UAA.

Organic farming involved an area of 157 168 ha and 1 637 producers in 2009, while 662 producers were engaged in organic livestock production.

According to the Agricultural Census (INE, 2009), Total Standard Output (TSO) at national level stands at over €4.6 billion per year, Alentejo and Ribatejo e Oeste accounting for over half this value. The mainland regions with the lowest contribution to national TSO are Algarve (3%) and Beira Interior (6%). The analysis of holdings according to economic size shows that although large-scale production units (over €100 000 TSO) represent only 3% of total agricultural holdings, they generate over half the annual TSO, with an average per holding of €304 000, 20 times greater than the national average of around €15 200 per holding. The significant asymmetry of national agriculture is also demonstrated by the fact that over three quarters of holdings are very small, generating an average of only €2 500 per holding, and account for a mere 13% of national agricultural TSO.

Against this background of considerable asymmetry, responses must be found which take the different circumstances of national agriculture into account and contribute towards sustainability.

2.3. Authorisation of plant protection products in Portugal

On 31 December 2012, a total of 907 plant protection products were authorised for sale, based on 248 active substances distributed as shown in the following diagram:

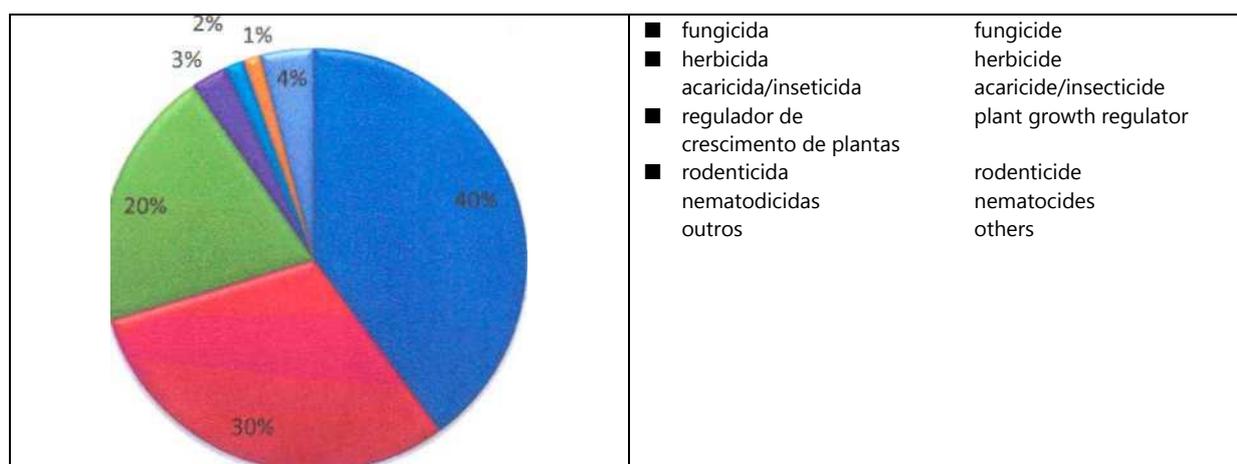


Fig. 2.3.1 – Distribution of plant protection products by function (DGAV, 2013)

This figure clearly shows that the largest volumes of plant protection products on the national market are fungicides, followed by herbicides and insecticides, the remainder as a whole representing no more than 15% of total plant protection products marketed in Portugal.

2.4. Development of sales of plant protection products

Sales of plant protection products at national level represent the indicator which provides an estimate of the use of these products. Under Article 26 of Decree Law No 94/98 of 15 April 1998, data on sales of plant protection products must be sent annually to the national

competent authority for plant protection, the *Direção-Geral de Alimentação e Veterinária* (DGAV) [Directorate-General for Food and Veterinary Affairs], by the organisations responsible for placing such products on the market. The results are published on an annual basis by the DGAV. Sales data are provided by companies or their partners by 31 May 2012, organised by active substance (a.s.) and by chemical group, depending on their function.

According to data published for 2011, at the end of that year 872 plant protection products were authorised for sale in Portugal (excluding out-of-stock items), based on 222 active substances.

The following table shows the volume of sales of plant protection products in 2011 by function.

Table 2.4.1 – Sales of plant protection products in 2011 (kg a.s.) (DGAV, 2012)

	Quantity (kg a.s.)
Fungicides	9 968 444
Inorganic	7 412 771
Cupric	715 662
Sulphur	6 697 109
Benzimidazoles	16 584
Diazoles, imidazoles and triazoles	38 871
Carbamates and dithiocarbamates	1 683 964
Morphines	17 233
Others	799 032
Herbicides	1 995 271
Phenoxy-phytohormones	48 972
Triazines and triazinones	190 919
Amides and amylases	160 192
Carbamates and bi-carbamates	2 706
Dinitroanilines	31 267
Derivatives of urea, uracil or sulphonylurea	34 209
Others	1 527 007
Insecticides and acaricides	334 400
Pyrethroids	7 327
Carbamates and oxime-carbamates	12 352
Organophosphates	301 782
Organic produce or produce of botanical origin	2 063
Others	10 967
Plant growth regulators	3 868
Molluscicides	10 317
Other plant protection products	1 690 163
Mineral oil	542 247
Soil fumigants	1 316 413
Rodenticides	6314
All remaining plant protection products	21 104
TOTAL*	14 002 464

* Decimals adjusted due to adding of adjustments in items

Fungicides represent around 71% of the plant protection products sold. Sulphur, representing

90% of the volume of inorganic fungicides, accounted for 67% of total fungicides and represented 40% of total plant protection product sales.

Herbicides accounted for around 14% of sales of plant protection products, while insecticides/acaricides accounted for 2% of total sales. Nematocides and soil fumigant products accounted for 8% of total sales. The remaining groups of products account for sales volumes with no impact on the total value concerned.

The following graphs show the development of total sales and the principal groups over five years (2007-2011) (Figs. 2.4.1 to 2.4.5).

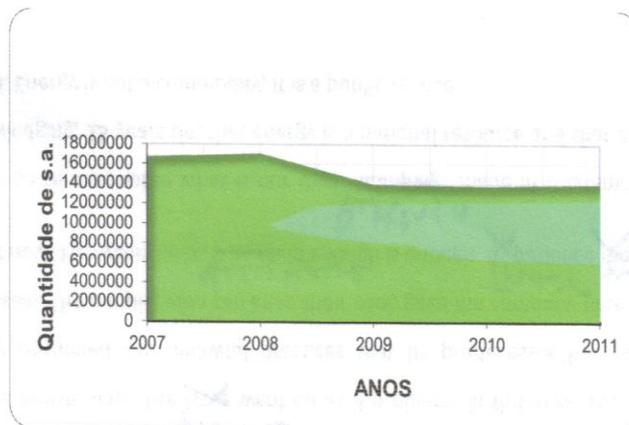


Fig. 2.4.1 – Development of total sales of plant protection products (DGAV, 2012)

Quantidade de s.a.	Quantity of s.a.
ANOS	YEARS

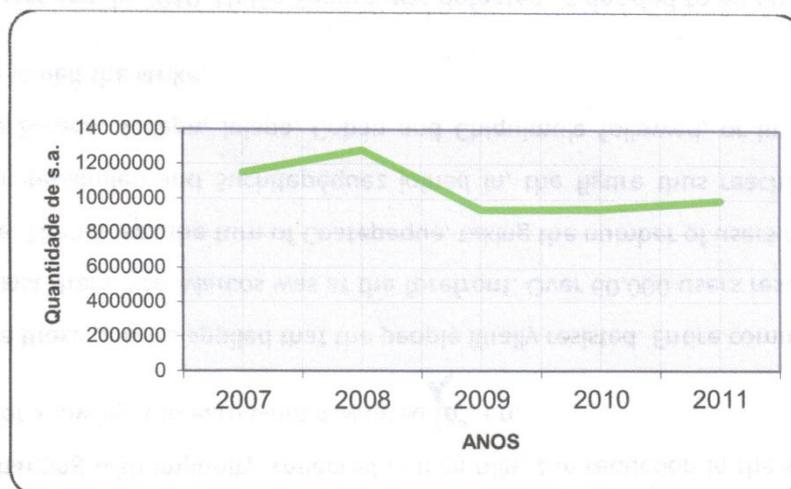


Fig. 2.4.2 – Development of sales of fungicides (DGAV, 2012)

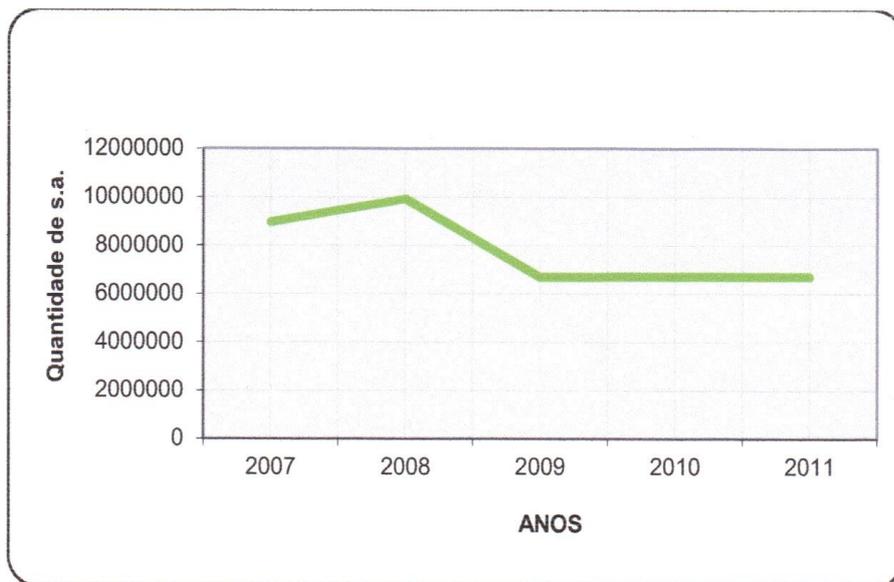


Fig. 2.4.3 – Development of sales of sulphur (DGAV, 2012)

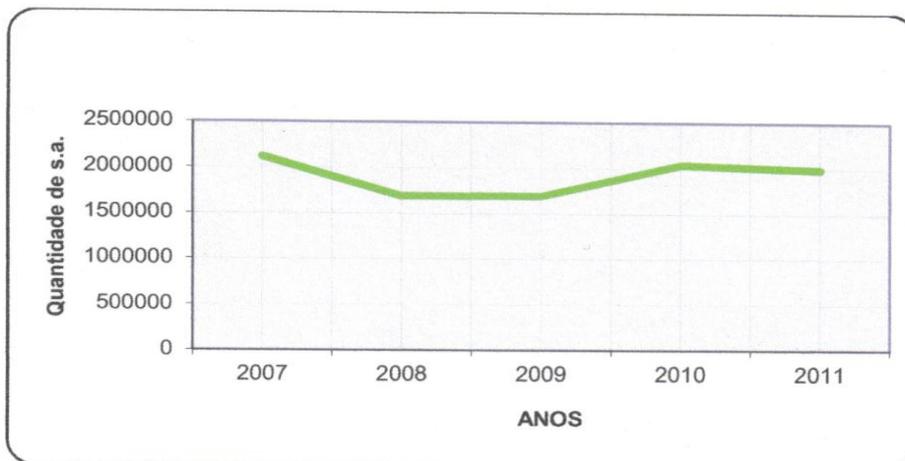


Fig. 2.4.4 – Development of sales of herbicides (DGAV, 2012)

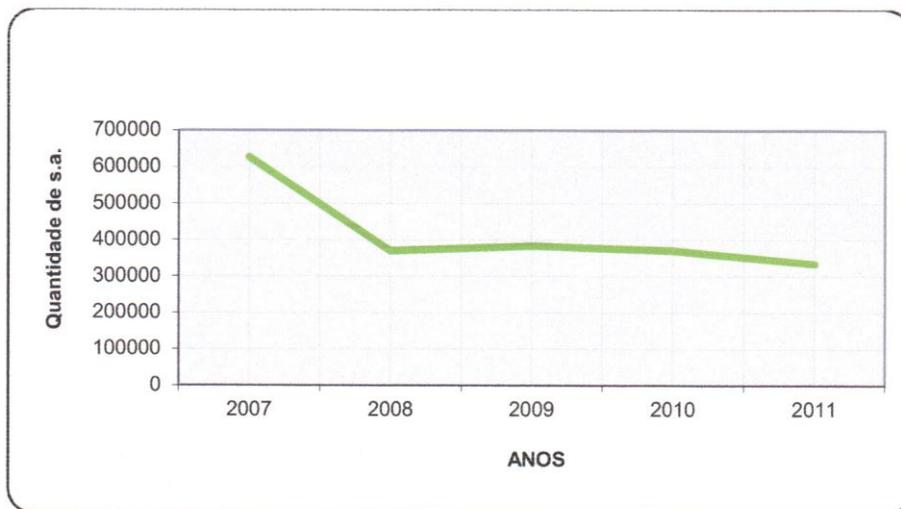


Fig. 2.4.5 – Development of sales of insecticides and acaricides (DGAV, 2012)

According to the Agricultural Statistics (INE, 2011), the ratio of sales of plant protection products/utilised agricultural area in 2008, 2009 and 2010 was 4.6, 3.8 and 3.8 respectively. If the value of sulphur is subtracted from total sales, the ratio is 1.9, 2.0 and 1.9 respectively.

III. National Context of the Use of Plant Protection Products.

3.1. Legal framework

Because of Portugal's geographical situation and favourable climate, the country's agriculture is highly varied in terms of crops grown, though it also suffers from many plant health problems. This necessitates a crop protection strategy involving the intensive use of all available means, particularly plant protection products, which must be sufficient in number and chemical diversity (different means of action) to ensure adequate prevention of crop pest resistance.

In this context the use of plant protection products as a production factor is particularly important since they account for a substantial proportion of the yield obtained from production, which varies according to the crop concerned and the intensity of use of such products in pest control, which in turn depends on the number, type and severity of the effects caused by the various pests.

Directive 2009/128/EC provides for coordination with the Water Framework Directive (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), and this action plan must therefore take account of the provisions and philosophy of that Directive, particularly with respect to water resource protection.

The national and EU legislation whose application in Portugal has direct and indirect implications for the marketing and use of plant protection products will now be summarised.

a) Placing of plant protection products on the market

- **Decree Law No 94/98 of 15 April 1998**, laying down implementing technical standards for Decree Law No 284/94 of 11 November 1994, which transposes into national law Council Directive 91/414/EEC of 25 July 1991 concerning the placing of plant protection products on the market, and establishing the scheme for approving, authorising, placing on the market, using, controlling and monitoring such products.

Based on the precautionary principle and on preventing the risks and effects of plant protection products on human health and the environment, this Decree Law establishes a harmonised uniform procedure among Member States for approving such products. It introduces for the first time a harmonised uniform system ensuring the Community assessment of active substances with a view to their approval at EU level and their inclusion in Annex I of Directive 91/414/EEC. This is achieved by applying data and information requirements on the active substance and plant protection product envisaged in Annexes II and III of the Directive and the uniform evaluation and decision-making principles provided for in Annex VI, which are to be applied in authorising plant protection products. This national procedure is consistent with the principle of subsidiarity between Member States.

In the light of certain requirements concerning physical and chemical properties, methods of analysis, toxicology, consumer health, ecotoxicology and the environment consistent with the technical and scientific progress prevailing at the time, the implementation of Directive 91/414/EEC at Community and national level provided for the revision of around 1 000 active substances and led to the withdrawal of over 600 such substances from the Community market, thereby significantly reducing the number of substances that could be used in plant

protection products.

Together with the Community revision of substances, new substances introduced into the market in the meantime are also evaluated according to the same principles.

In addition to the provisions in Annexes II, III and VI of the Directive, Annexes IV and V refer to the risks identified in evaluating the intrinsic characteristics of the substance and its plant protection product and the safety measures to be taken to minimise the risk associated with the use of the product concerned, which Member States adopt after evaluating its various components while also taking the associated agricultural practice into account. It is mandatory to affix these indications on packaging labels, and users of the product must comply with them.

This Directive was subsequently repealed by Regulation (EC) No 1107/2009, though some of its provisions applied on a transitional basis.

- **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.

This EU legislation, which is directly applicable in Member States, forms the current legal framework for authorising plant protection products in Portuguese territory. Its objectives, based on reinforcing the precautionary principle, seek to guarantee a high level of protection of human health and the environment while simultaneously preserving agricultural competitiveness.

This legislation revises and updates the previous legislation, i.e. Directive 91/414/EEC, while maintaining the harmonised EU procedure for approving active substances operated by the Member States, the European Commission and the European Food Safety Authority (EFSA). The assessment of substances presupposes their evaluation at EU level and national authorisation of the plant protection product. Europe is divided into three areas in this respect, which means that an application to authorise the placing of a plant protection product on the market is submitted on a zonal basis, and that the work between Member States to ensure national authorisation is shared. This includes *inter alia* assessing the intended use of the product and its behaviour in the various environmental compartments – soil, surface and groundwater, air – and its effects on non-target organisms, particularly plants, birds and other land vertebrates, aquatic organisms including fish, invertebrates, algae and higher plants, beneficial arthropods, including bees and other pollinators, macro- and micro-organisms in the soil, and the possible impact on waste water treatment.

The content of an authorisation includes conditions and restrictions relating to the plant protection product which seek to ensure its safe use, including its classification, the category of user concerned and safety indications to be followed in handling and applying the product and handling packaging waste.

The Regulation additionally includes particularly important aspects which also contribute to achieving the objectives set out in Directive 2009/128/EC, i.e. the mandatory requirement to record all professional activities relating to the placing on the market, marketing, distribution and application of plant protection products, with special attention being paid to their correct use.

b) Marketing, distribution and use of plant protection products

- **Decree Law No 173/2005 of 21 October 2005**, which regulates the distribution and sale of plant protection products, provision of the respective application services and the application of such products by end-users.

This Decree Law established the first national framework for regulating the commercial distribution and sale of plant protection products with a view to reducing their risks and impacts on human health and the environment. The primary aim was to achieve the objectives set out in the strategy for the sustained use of these products formulated by the European Commission. This legal framework defined the fundamental aspects of the responsible sale of plant protection products by introducing the technician responsible for distribution and sales activities, who must have undergone training commensurate with his or her responsibilities. This also applies to sales operators, who have responsibilities relating to the sale and handling of these products. This Decree Law also helped to promote good storage practice for plant protection products by establishing measures governing their distribution and sale, the installation of storage or distribution facilities and the licensing of the respective sales outlets, in compliance furthermore with legislation in force on safety and health at work and protection against fire risks.

This legal framework also introduced a penalty scheme for the inappropriate marketing and use of plant protection products, which can only be applied by professional users who provide evidence of their technical competence and who hold the respective certificates.

- **Law No 26/2013**, which regulates the distribution, sale and application of plant protection products for professional use and adjuvants of plant protection products and defines the procedures for monitoring the use of such products, transposing into national law 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, and repealing Law No 10/93 of 6 April 1993 and Decree Law No 173/2005 of 21 October 2005.

This Law brings up to date and reinforces the provisions previously established in DL No 173/2005. It is nevertheless an adaptation to the new EU guidelines set out under Directive 2009/128/EC, which is based on the sustainable use of pesticides by reducing the risks and effects of their use on human health and the environment and promoting the use of integrated pest management or alternative techniques such as non-chemical alternatives. This Law therefore develops aspects relating to the safe marketing, storage and use of plant protection products and the monitoring of records relating to such activities, regulates aerial applications in compliance with the general principle of prohibition, and regulates the application of these products in urban and recreational areas and communication routes.

- **Decree Law No 101/2009 of 11 May 2009**, which regulates the non-professional use of plant protection products in domestic environments and introduces conditions for their authorisation, sale and application.

This Decree Law aims to provide a framework for the authorisation, sale and use of plant protection products in domestic environments by non-professional users. These products may be purchased, handled and applied by the general public in plant protection at domestic level, either in dwellings or on surrounding or nearby land. Within this framework, general public access is naturally restricted to certain categories of product, particularly those considered to

be highly toxic to humans or which represent a particular health hazard if people are exposed to them during their handling or application. Such products may nevertheless be marketed in commercial outlets, including those not intended solely for the sale of plant protection products, though they must be separated from other consumer goods. These outlets must also ensure that information on their safe handling and use is available or can be provided when they are purchased by the general public.

This Decree Law also prohibits the application by non-professional users of plant protection products authorised for use by farmers and other professional operators.

- **Decree Law No 86/2010 of 15 July 2010**, which establishes the mandatory inspection scheme for application equipment for plant protection products authorised for professional use.

Decree Law No 86/2010, which transposes Article 8 of Directive 2009/128/EC into national law, introduced the mandatory inspection scheme for application equipment for plant protection products authorised for professional use. This Decree Law seeks to ensure that all application equipment is inspected on a regular basis, though provision is made for exempting handheld application equipment and application equipment not used for spraying plant protection products, without overlooking the need for periodic verification, calibration and maintenance of devices to ensure their proper performance.

Mandatory duly licensed *Centros de Inspeção Periódica* [Centros IPP – CIPPs – periodic inspection centres] for plant protection product application equipment were also established and provision was made for authorising appropriately trained technicians to inspect essential equipment and accessories to ensure their proper performance.

- **Decree Law No 187/2006 of 19 September 2006**, which establishes the safety requirements and procedures concerning systems for managing plant protection product packaging waste and surpluses.

This Decree Law establishes the legal framework for managing plant protection product packaging waste and surpluses on agricultural holdings and defines procedures for their packaging and collection, whether on the holding or in collection facilities, in compliance with environmental safety principles. It also supplements and amends Article 19 of Decree Law No 173/2005. This act regulates the operation of (individual or collective) management systems for such waste, referring the respective licensing/authorisation back to Order in Council No 29-B/98 of 15 January 1998, based on the sharing of responsibility by the various parties involved, from companies holding sales or parallel import authorisations for plant protection products to end-users. It also defines the safety procedures to be observed by facilities which receive, collect, temporarily store and forward plant protection product packaging waste and surpluses. Under these procedures and according to indications on labels, farmers take measures on their holdings to minimise the level of packaging waste, including triple washing and the possible destruction of empty packaging, depending on the type of material and the respective capacity. They also pack waste in bags for subsequent delivery on pre-established dates to authorised collection centres, which forward it for future energy recovery or disposal under the system for managing and recovering plant protection product waste. Provision is also made for the establishment of collection centres linked to the licensed management systems to receive plant protection product packaging waste and surpluses. These centres form a national network organised according to proximity which encourages the forwarding of such waste to the management systems.

- **Order in Council No 758/2007 of 3 July 2007**, which refers responsibility for collecting and managing plant protection product packaging waste with a capacity or weight equal to or greater than 250 l or 250 kg back to the company holding the respective sales or parallel import permit.

This legislation defines the party responsible for collecting packaging waste with a capacity or weight equal to or greater than 250 l or 250 kg, referred to in Article 5(1) of Decree Law No 187/2006 of 19 September 2006, attributing responsibility to the company holding the sales or parallel import authorisation, until organisations managing plant protection product packaging waste of the capacity or weight referred to above are licensed.

- **Decree Law No 147/2008 of 29 July 2008**, as amended by Decree Law No 245/2009 of 22 September 2009, Decree Law No 29-A/2011 of 1 March 2011 and Decree Law No 60/2012 of 14 March 2012, which establishes the legal system of liability with regard to environmental damage and transposes into national law Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004, which approved, on the basis of the polluter pays principle, the system covering environmental liability with regard to the prevention and remedying of environmental damage, as amended by Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries, and by Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide.

This Decree Law applies to environmental damage or to an imminent threat of such damage caused by any occupational activity carried out in the course of an economic activity, even if caused by diffuse pollution. The operator causing environmental damage or creating an imminent threat of such damage must immediately take the appropriate measures to prevent and remedy such damage or threat. The occupational activities covered by this legislation include the use of plant protection products (Annex III(7)(c)).

c) Classification, packaging and labelling of plant protection products

- **Decree Law No 82/2003 of 23 April 2003**, which approves the regulations for the classification, packaging, labelling and safety action records of dangerous preparations.

In connection with plant protection products, the application of this Decree Law on the classification, packaging and labelling of dangerous preparations, which transposes Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999, is particularly important. This act, as amended by DL 63/2008 of 2 April 2008 and which will be repealed in stages by Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008, provides for the mandatory classification, packaging and labelling of dangerous preparations before they are placed on the market. It therefore applies to plant protection products and supplements legislation on their placing on the market.

In compliance with and supplemented by the latter Regulation, Regulation (EU) No 547/2009 of 8 June 2009, which implements Regulation (EU) No 1107/2009 in relation to plant protection product packaging requirements, is also applied.

d) Establishment of Maximum Residue Levels (MRLs) and their control

- **Regulation (EC) No 178/2002 of 28 January 2002**, laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.
- **Regulation (EC) No 882/2004 of 29 April 2004** on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.
- **Regulation (EC) No 396/2005 of 23 February 2005** on maximum residue levels of plant protection products in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC.
- **Regulation (EC) No 669/2009 of 24 July 2009**, implementing Regulation (EC) No 882/2004 as regards the increased level of official controls on imports of certain feed and food of non-animal origin and amending Decision 2006/504/EC.
- **Regulation (EU) No 1277/2011 of 8 December 2011**, amending Annex I to Regulation (EC) No 669/2009 implementing Regulation (EC) No 882/2004 as regards the increased level of official controls on imports of certain feed and food of non-animal origin.
- **Decree Law No 144/2003 of 2 July 2003** (repealed, except for Articles 10 and 11), laying down the scheme for maximum residue levels for plant protection products permitted in agricultural products of plant origin intended for human consumption or, albeit occasionally, for use as feedingstuffs, hereinafter referred to as agricultural products, and in the same agricultural products when dried or processed or after being incorporated into compound feed, insofar as they may contain plant protection product residues.
- **Decree Law No 39/2009 of 10 February 2009**, implementing and ensuring compliance in national law with the obligations arising out of Regulation (EC) No 396/2005.

In particular, Regulation (EC) No 396/2005 introduces the scheme for establishing EU-harmonised MRLs for plant protection products in food and feed and procedures for their control. This basic legal tool for defining MRLs constitutes a standard which, when not exceeded, attests to food safety and allows freedom of movement in the European market for plant products treated with protection products. The establishment of MRLs not only concerns food safety but also control of the use of plant protection products in crops.

This Regulation also establishes the requirement for Member States to define their national multiannual programmes for controlling pesticide residues in products of plant origin and to submit the respective results to the European Commission, the European Food Safety Authority and other Member States.

Its principal objective is to assess the exposure of national and European consumers to pesticide residues in agricultural products of plant origin intended for human consumption by the appropriate selection of such products and of pesticides in accordance with a representative and enforceable sampling plan which takes installed capacity in pesticide residue laboratories into account. It also seeks to ensure compliance by food chain operators with national and EU legislation on pesticide residues in agricultural products of plant origin

intended for human consumption.

The following Decree Laws also supplement the above legislation:

- **Decree Law No 53/2008 of 25 March 2008**, which transposes into national law Commission Directive 2006/125/EC of 5 December 2006 and establishes the legal scheme applicable to foodstuffs for particular nutritional use fulfilling the particular requirements of infants and young children in good health and intended for use by infants while they are being weaned and by young children as a supplement to their diet and/or for their progressive adaptation to ordinary food.
- **Decree Law No 217/2008 of 11 November 2008**, which transposes into national law Commission Directive 2006/141/EC of 22 December 2006 with respect to infant formulae and follow-on formulae, establishes the respective legal scheme and repeals Decree Laws No 220/99 of 16 June 1999, 286/2000 of 10 November 2000 and 138/2004 of 5 June 2004.

Decree Laws No 53/2008 and 217/2008 establish a cross-cutting residue level for each specific pesticide of 0.01 mg/kg of product ready for consumption or reconstituted in accordance with the manufacturer's instructions for cereal-based foods, baby foods, infant formulae and follow-on formulae respectively, though exceptions to this level are provided for. They also prohibit the use of certain pesticides in agricultural products intended for the above formulae, stipulating a reduction in the limit to 0.003 mg/kg.

An annual report coordinated under DGAV responsibility is produced on the implementation of the control programme.

e) Biodiversity conservation

- **Decree Law No 140/99, republished by Decree Law No 49/2005**, transposes into national law Directive 79/409/EEC on the conservation of wild birds and Directive 92/43/EC on the conservation of natural habitats and of wild fauna and flora.
- **Decree Law No 142/2008** establishes the legal scheme for nature and biodiversity conservation.

f) Environmental quality in water policy

- **Law No 58/2005 of 29 December 2005**, which approves the *Lei da Água* [Law on Water], transposes Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 into national law and establishes the bases and institutional framework for sustainable water management. This law was amended by Decree Law No 245/2009 of 22 September 2009 and Decree Law No 130/2012 of 22 June 2012. Seeking to maintain and improve the aquatic environment, this Law establishes the framework for managing surface and groundwater with a view to preventing further deterioration and protecting and enhancing the status of aquatic and terrestrial ecosystems and wetlands, promoting the sustainable use of water based on a long-term protection of available water resources, ensuring enhanced protection and improvement of the aquatic environment through specific measures to reduce or eliminate discharges, emissions and losses of priority substances, ensuring the progressive reduction of pollution of groundwater and preventing its further pollution.

The Law on Water (based on the Water Framework Directive) thus seeks to protect surface and groundwater bodies and sets a deadline of 2015 for achieving the environmental objectives through the adoption of measures defined in legislation and planning instruments (River Basin Management Plans, National Water Plan, among others).

In this context the good status/ecological potential and good chemical status of surface water bodies and the good quantitative and chemical status of groundwater bodies must be ensured by 2015 (notwithstanding the extensions and derogations envisaged).

The measures provided for in this legislation for pesticides include limiting or even prohibiting the application and storage of plant protection products and disposal of the respective waste in particularly sensitive areas. In the case of the abstraction of drinking water, it establishes the need to distinguish areas for protecting such abstraction (particularly against pollution caused by plant protection products). Emissions or discharges of priority substances which present a significant risk to the aquatic environment must be reduced or even eliminated in the case of priority hazardous substances. Pollution caused by other hazardous substances likely to prevent the achievement of the objectives for surface water bodies must also be reduced.

The defining of environmental objectives also involves the existence of programmes for monitoring water quality.

- **Decree Law No 77/2006 of 30 March 2006** supplements the transposition of Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000, which establishes a framework for Community action in the field of water policy, and develops the scheme established in Law No 58/2005 of 29 December 2005.

This Decree Law defines the technical standards for characterising and monitoring the qualitative and quantitative status of groundwater and surface water, while also establishing criteria for defining maximum emission levels and environmental quality standards for the principal pollutants and the list of priority substances and priority hazardous substances (repealed by Decree Law No 103/2010 of 24 September 2010), emissions of which are to be reduced or eliminated.

- **Decree Law No 226-A/2007 of 31 May 2007**, as amended, establishes the system for regulating the use of water resources.
- **Decree Law No 208/2008 of 28 October 2008**, which transposes Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 into national law, establishes the scheme for protecting groundwater against pollution and deterioration. This Decree Law establishes the groundwater Quality Standard (QS) for pesticides (including their relevant metabolites, breakdown or reaction products) at 0.1 µg/l per active substance and 0.5 µg/l for total active substances detected. **Decree Law No 107/2009 of 15 May 2009** approves the scheme for protecting reservoirs and lagoons or lakes whose waters are to be used in the public service. It also includes provisions governing pesticide use and storage and residue management.
- **Order in Council No 1284/2009 of 19 October 2009** establishes the content of river basin management plans.

- **Decree Law No 103/2010 of 24 September 2010**, which transposes Directive 2008/15/EC of the European Parliament and of the Council of 16 December 2008 and partially transposes Commission Directive 2009/90/EC of 31 July 2009, establishes Environmental Quality Standards (EQS) relating to the chemical status of surface water bodies for 33 priority substances and another eight pollutants. With respect to plant protection products, alachlor, atrazine, chlorfenvinphos, chlorpyrifos, diuron, endosulfan, hexachlorobenzene, hexachlorocyclohexane (lindane or isomer and hexachlorocyclohexane), isoproturon, simazine and trifluralin are listed as priority substances. Plant protection products containing any of the priority hazardous substances listed are currently not authorised in Portugal. DDT (total and pp'-DDT) was included in the other pollutants group while aldrin, dieldrin, endrin and isodrin were included in the cyclodiene group. The list of substances in this act is also currently being revised at EU level. This Decree Law was amended by Decree Law No 83/2011 of 20 June 2011.

g) Quality of drinking water

- **Decree Law No 382/1999 of 22 September 1999** establishes the rules and criteria for marking protection boundaries for the abstraction of groundwater for public supply. This act specifically determines that any facility or activity (except for activities relating to the abstraction itself) is prohibited in the immediate protection zone, and that certain activities may be prohibited or subject to conditions in the intermediate protection zone, particularly the application of mobile and persistent pesticides in water, or pesticides which may form toxic, persistent or bioaccumulative substances. This is supplemented by Order in Council No 702/2009 of 6 July 2009, which establishes the terms for marking protection boundaries for the abstraction of groundwater for public supply for human consumption and the respective constraints.
- **Decree Law No 306/2007 of 27 August 2007** establishes the drinking water quality scheme and revises Decree Law No 243/2001 of 5 September 2001.

This legislation transposes Directive 98/83/EC of 3 November 1998 into national law. Under this legislation management bodies must monitor pesticides which are likely to be present in a particular supply zone, taking the location of the water source into account. In this context the National Plant Protection Authority is responsible for defining for each year the pesticides to be tested by the management bodies in the following year. It is also assumed that particular supply zones will be exempted from pesticide testing on the basis of an analysis of the predominant agricultural practices in each farming region, indicators relating to the use of pesticides in the area of influence of the abstraction and the type of geographical location of the latter.

h) Sustainable production and protection

- **Regulation (EC) No 1698/2005 of 20 September 2005**, which establishes the general rules of support for sustainable rural development, seeks to improve the environment and the countryside.
- **Regulation (EC) No 834/2007 of 28 June 2007** on organic production and labelling of organic products repeals Regulation (EEC) No 2092/91.
- **Regulation (EC) No 889/2008 of 5 September 2008** lays down detailed rules for the

implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control.

- **Decree Law No 256/2009 of 24 September 2009, as amended by Decree Law No 37/2013 of 13 March 2013**, establishes the principles and guidelines for integrated pest management and production and the system of technical standards applicable to integrated pest management, integrated production and organic production, and introduces a system for recognising technicians competent in these areas in the context of primary agricultural production.

i) Safety and health at work

- **Law No 102/2009 of 10 September 2009** on the legal scheme for promoting safety and health at work regulates certain aspects regarding the protection of workers from risks due to exposure to chemicals.
- **Decree Law No 254/2007 of 12 July 2007** establishes the scheme for preventing major accidents involving dangerous substances and limiting their consequences for man and the environment, transposing into national law Directive 2003/105/EC of the European Parliament and of the Council of 16 December 2003, which amends Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances.
- **Decree Law No 24/2012 of 6 February 2012** consolidates the minimum provisions on protecting workers from risks due to exposure to chemicals at work and transposes into national law Commission Directive 2009/161/EU of 17 December 2009, establishing a third list of 581 indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC of 8 June 2000.

The legislation protecting workers from risks due to exposure to chemicals essentially arises out of the transposition of Community Directives and could be found in different acts. Decree Law No 24/2012 simplifies and consolidates in a single Decree Law the legislation which transposed the above Directives, except for Law No 102/2009 of 10 September 2009 on the legal scheme for promoting safety and health at work, which regulates certain aspects regarding the protection of workers from risks due to exposure to chemicals.

Law No 102/2009 regulates the legal scheme for promoting safety and health at work, as provided for in Article 284 of the Labour Code in terms of prevention, and:

- a) the protection of pregnant workers and workers who have recently given birth or are breastfeeding in the case of activities likely to present a specific risk of exposure to agents, processes or conditions of work, as provided for in Article 62(6) of the Labour Code;
- b) the protection of minors in the case of work which, due to its nature or the conditions in which it is provided, is prejudicial to their physical, mental and moral development, as provided for in Article 72(6) of the Labour Code.

This act also transposes into national law Council Directive 89/391/EC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers

at work, as amended by Council Directive 2007/30/EC of 20 June 2007, and supplements the transposition of the following Community Directives:

- a) Council Directive 91/383/EEC of 25 June 1991 supplementing the measures to encourage improvements in the safety and health at work of workers with a fixed-duration employment relationship or a temporary employment relationship;
- b) Council Directive 92/85/EEC of 19 October 1992 on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding;
- c) Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work;
- d) And with respect to the protection of genetic heritage: directives containing minimum safety and health provisions on chemical, physical and biological agents at work, particularly Council Directive 90/394/EEC of 28 June 1990 on the protection of workers from the risks related to exposure to carcinogens at work, as amended by Council Directive 97/42/EC of 27 June 1997 and Council Directive 1999/38/EC of 29 April 1999; Council Directive 90/679/EEC of 26 November 1990 on the protection of workers from risks related to exposure to biological agents at work, as amended by Council Directive 93/88/EEC of 12 October 1993; and 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.

3.2. Current situation

The current national situation in areas covered by Directive 2009/128/EC and this National Action Plan as a result of the application of the above legislation, which has direct and indirect implications on the marketing and use of plant protection products, will now be outlined.

3.2.1. Safety in the application of plant protection products

- **Pesticide residue control**

With the aim of ensuring compliance with MRLs and assessing consumer exposure to pesticide residues, the official programme for the control of such residues in agricultural products of plant origin intended for human consumption is implemented annually on the basis of the implementing regulations of the Coordinated Multiannual Community Pesticide Residue Control Programme.

At national level the impact of pesticides on agricultural products of plant origin, which due to repeated infringements in previous years must be monitored, is also considered and included in the plan.

This plan is interlinked with the import control plan in defining priorities and selecting the control sample (Commission Implementing Regulation (EU) No 1277/2011 of 8 December 2011) and with the plan for the control of foodstuffs intended for particular nutritional uses (cereal-based foods and baby foods for infants and young children) (Decree Law No 53/2008 of 25 March 2008) and infant formulae and follow-on formulae (Decree Law No 217/2008 of 11 November 2008) in relation to pesticide residues in agricultural products of plant origin intended for human consumption. It also supplements the national food sampling plan in testing for pesticides.

Table 3.2.1 – Results of the Official Control of Pesticide Residues in Products of Plant Origin – 2007-2011 (DGAV, 2012).

Year	No of samples	No of products analysed	No of pesticides tested	% infringements
2007	711	8*+17**	147	7.6
2008	758	8*+19**	146	6.5
2009	969	8*+18**	165	2.9
2010	752	8*+19**	230	2.9
2011	865	9*+19**	250	2.3

NB:*European coordinated programme; **national programme, including Mainland Portugal and Autonomous Regions

- **Protection of professional users – Use of Personal Protective Equipment (PPE)**

Estimating the potential exposure of agricultural operators who handle and subsequently apply products (and prepare spray mixtures, where applicable) and agricultural workers and bystanders who may come into contact with products during or after their application is an integral part of the process for authorising plant protection products. The toxicological profile of a product is used to estimate the risk associated with its use, which will be minimised by wearing appropriate Personal Protective Equipment (PPE). PPE must therefore be worn as a matter of course to minimise the exposure of operators (and other agricultural workers) to plant protection products during plant protection work. The minimum recommended PPE consists of gloves, rubber boots and a full suit. When preparing mixtures, operators must always use visors, with dust masks in the case of dust mixtures.

The use of PPE in national agricultural conditions is generally restricted to the use of rubber boots and gloves in preparing mixtures and applying products, though visors are also used, albeit considerably less often. Full personal protection suits are not used on a regular basis, however, largely because they are uncomfortable in Portuguese climatic conditions (high temperatures for a large part of the year).

Operator protection is not ensured solely by the use of PPE, however, but also by using application techniques which significantly reduce the potential risk of exposure to products. When the crop grown and the cultivated area allow, for example, tractors with cabs are used which significantly reduce potential exposure and represent an effective substitute for personal protective suits, masks and goggles.

Information collected by ANIPLA (the Portuguese national association for the plant protection industry) indicates that at European level only Portugal and Germany have specific standards governing the production of protective suits for applying plant protection products (NP 4462 and DIN 32871). On the basis of the national standard, NP 4462:2007, around 1 000 suits have been produced and marketed in Portugal.

These protective suits have also been certified under EN 13034:2005 (type 6) in other European countries, from which ANIPLA and its member companies have imported hundreds of examples.

3.2.2. Training, sale of plant protection products, information and awareness-raising

- **Training of professional users**

Training on reducing the risks involved in using plant protection products, based on officially defined content, began in Portugal with publication of *Despacho* [Order] 5848/2002 of 15 March 2002. This act defines the content and requirements for trainers and trainees in relation to courses on Plant Protection Product Distribution, Marketing and Application (PPPDMA), Plant Protection Product Distribution and Marketing (PPPD) and Plant Protection Product Application (PPPA), which are geared towards technicians, sales staff and operators respectively.

The PPPD and PPPA courses, with syllabuses revised in accordance with the subjects set out in Annex I of Directive 2009/128/EC, are included in the National Qualifications Catalogue. The syllabus of the PPPDMA course has also been updated.

There are also courses on the Specialised Application of Plant Protection Products and the Inspection of Plant Protection Product Application Equipment, the syllabuses and trainer and trainee requirements of which have now been officially defined.

The official system for approving training activities relating to the above-mentioned courses involves authorising training providers and approving the proposed training. Certificates are officially validated after training has been delivered.

Since the setting up of mandatory training is an essential matter to be considered in implementing the requirements of Directive 2009/128/EC, steps have been taken to ensure the respective funding in each Community support programming period.

Data on training carried out and trainees involved in 2011 and 2012 are presented below.

Table 3.2.2 – Training carried out and trainees involved – 2011 and 2012 (DGADR, 2012)

Type of course	Year	No of initiatives	No of trainees
PPPDMA	2011	17	300
	2012	42	630
PPPDMA (update)	2011	13	260
	2012	13	195
PPPDMA	2011	12	182
	2012	10	149
PPPA	2011	383	4 680
	2012	285	4 841

- **Information and awareness-raising for plant protection product users**

The plant protection industry has organised many awareness-raising activities on the safe application of its products. In addition to those run by companies on an individual basis under the ‘Cultivar a Segurança’ project [Cultivate Safety] developed since 2006, ANIPLA has run activities in cooperation with the DRAPs and agrarian colleges under protocols established to set up model farms that satisfy the requirements for storing and applying plant protection products on holdings.

This essentially practical awareness-raising encompasses syllabuses defined for the Application of Plant Protection Products course and contributes towards the professional development of the respective professional operators. Between 2007 and 2012 ANIPLA ran 32 awareness-raising activities involving 900 farmers and technicians on five model farms in mainland Portugal.

- **Responsible sale, authorisation of activities and approval of technicians**

Decree Law No 173/2005 defines the regulatory and disciplinary measures covering commercial activities relating to the distribution, sale and application of plant protection products and aims to reduce the respective health and environmental risks and impacts.

This Decree Law enforces compliance with good plant protection practice in terms of the correct and appropriate use of plant protection products by means of the recommended chemical protection, integrated pest management and integrated production.

This legislation requires premises for storing and selling plant protection products to be equipped to ensure that products are properly preserved and to ensure public health and environmental protection, and they must have an approved technician, adequately trained operators and facilities that meet safety requirements.

A particular requirement to be met by commercial establishments in order to obtain authorisation to engage in activity is the existence of an approved technician who has responsibility *inter alia* for ensuring compliance with current legislation.

The entry into force of Decree Law No 173/2005 began the process of approving technicians, 1 691 of whom had been approved by December 2012. Table 3.2.3 shows the distribution of approved technicians among the country’s various districts.

Table 3.2.3 – Distribution of the number of approved technicians per district per year (DGAV, 2013)

Districts/AR	2005	2006	2007	2008	2009	2010	2011	2012	Total
Aveiro	1	31	17	12	2	4	6	1	75
Beja	3	36	10	6	4	5	10	4	78
Braga	2	42	22	10	3	4	2	3	88
Bragança	0	26	16	7	0	2	4	4	59
Castelo Branco	3	11	12	6	4	3	2	2	43
Coimbra	3	47	30	7	7	5	2	4	105
Évora	1	40	12	3	2	5	4	3	70
Faro	2	23	10	12	13	15	9	8	92
Guarda	1	21	12	7	1	1	0	4	47
AR Azores	0	3	34	22	4	3	1	8	75
AR Madeira	0	7	1	3	6	0	1	0	18
Leiria	3	50	15	7	4	1	4	2	86
Lisbon	4	101	31	16	19	8	13	13	205
Portalegre	0	16	2	6	1	2	3	0	30
Porto	4	48	20	9	6	5	14	9	115
Santarém	3	70	30	26	3	6	13	9	169
Setúbal	0	35	6	6	4	4	6	8	69
Viana do Castelo	0	31	18	3	5	4	2	5	68
Vila Real	3	40	24	6	4	8	7	4	96
Viseu	2	55	19	7	3	1	9	6	102
SPAIN							1	1	2
TOTAL	35	742	341	181	95	86	113	98	1691

The development of the approval process shows that the district with the most approved technicians is Lisbon, followed by Santarém and Porto. The island of Madeira has the lowest number (due to its size), followed by Portalegre and Castelo Branco in the interior of the country. Fig. 3.2.1 provides an overview of the current situation and shows the development of technician approvals.

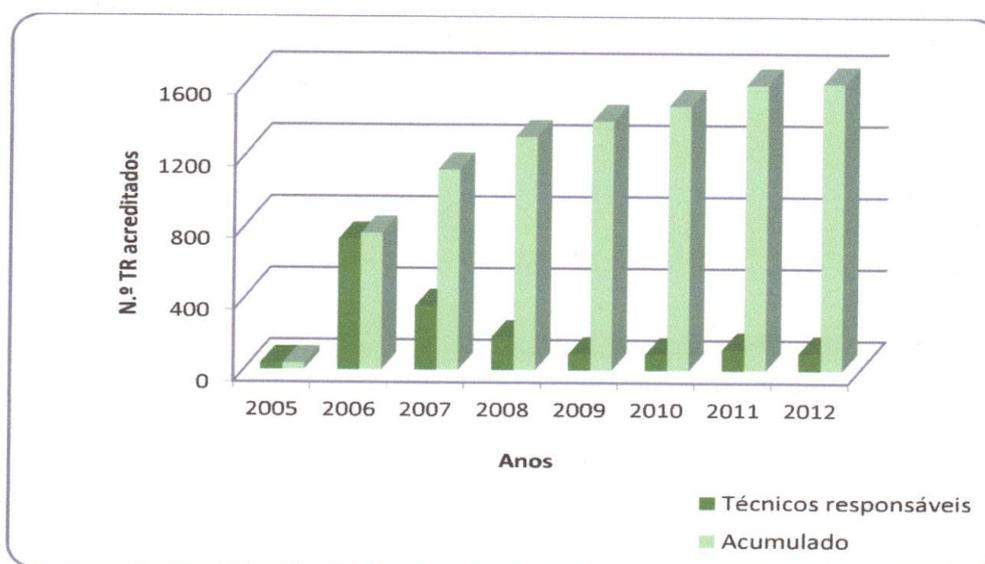


Fig. 3.2.1 – Absolute and cumulative approved technicians per year (DGAV, 2013)

N.º TR acreditados	No of approved technicians
Anos	Years
Técnicos responsáveis	Approved technicians
Acumulado	Cumulative

It can be seen that the highest number of accreditations occurred in 2006, followed by a decrease in subsequent years until 2010, with a slight increase in 2011 and 2012.

The districts concerned have been grouped by administrative regions in order to produce an analysis by DRAP and RA (Fig. 3.2.2).

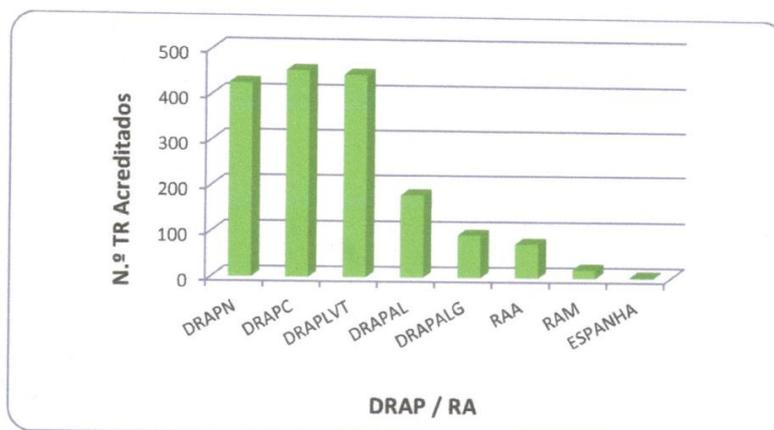


Fig. 3.2.2 – Approved technicians per Regional Agriculture and Fisheries Directorate (DRAP)/Autonomous Region (AR) on 31 December 2012 (DGAV, 2013)

While Table 3.2.1 shows that the districts with the most approved technicians, Lisbon and Santarém, come under the DRAPLVT, Figure 3.2.2 shows that the most representative figures relate to the DRAPC, with 438 approved technicians.

For the reason mentioned above, the Autonomous Region of Madeira (ARM) continues to record the lowest figures, with around 18 approved technicians.

The development of authorisations granted as at 31 December 2012 must be analysed with respect to authorisations to engage in distribution activity (D), sales (V), distribution and sales (DV) and land-based applications (AT) (Fig. 3.2.3).

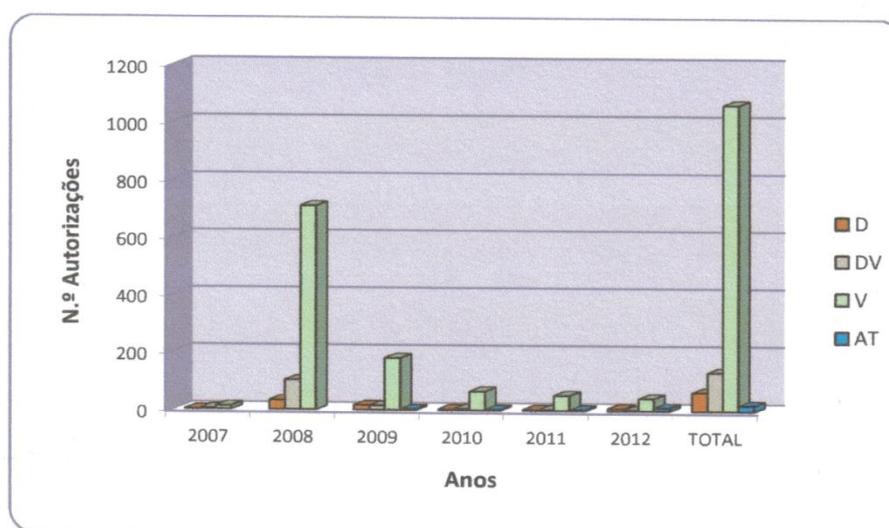


Fig. 3.2.3 – Number of authorisations to engage in activity (DGAV, 2013)

N.º Autorizações	No of approvals
Anos	Years

It can be seen that around 1 285 companies are currently authorised to distribute and sell plant protection products. A major rise in authorisations occurred in 2008, particularly for commercial establishments which only sell plant protection products.

Also significant is the limited number of authorisations granted to companies providing land-based application services in urban areas, communication routes and recreational areas, including gardens, which is where most of the activity of these companies takes place.

- **Code of conduct on the marketing and distribution of plant protection products**

The Code of Conduct on the Distribution and Sale of Plant Protection Products was published in 2010 and drawn up as provided for in Article 20 of Decree Law No 173/2005 of 21 October 2005. This Code constitutes a range of guidelines or standards of conduct to be adhered to by all public or private stakeholders involved in any way in handling plant protection products authorised for sale for professional use during their storage or marketing.

This Code of Conduct is to be used in the context of current legislation on the placing of plant protection products on the market and supplementary legislation, and is intended to represent a standard for good practice in the storage, distribution and sale of such products, since it disseminates the technical guidelines issued by the DGAV as the competent authority in this area.

3.2.3. Inspection of application equipment in use

Decree Law No 86/2010 was published to ensure the national implementation of provisions regulating the inspection of plant protection product application equipment and its maintenance in good condition. In accordance with Directive 2009/128/EC, this Decree Law stipulates that all equipment in use must be inspected at least once by 26 November 2016, and that after this date equipment that has not been inspected, such as handheld application equipment, may not be used, notwithstanding the exceptions provided for. Inspections must be carried out every five years until 31 December 2019 and every three years thereafter.

This Decree Law also sets out the requirements for inspecting spraying equipment mounted on trains or aircraft and boom sprayers larger than 3 m, including boom sprayers mounted on sowing equipment, the inspection of which is mandatory.

The rules for implementing technical aspects relating to compliance with the requirements of the above-mentioned Decree Law can be found in the '*Guia de requisitos e procedimentos para o reconhecimento dos Centros de Inspeção de Equipamentos de Aplicação de Produtos Fitofarmacêuticos – Centros IPP*' [sic], which establishes the requirements to be met by these centres and is published on the DGAV website.

It is estimated that over 56 000 items of plant protection product spraying equipment are used on over 48 000 holdings in Portugal (INE, RGA, 1999). No more recent data has been published, though the stock of machinery on holdings tended to decline between 1999 and 2009, except for tractors, which increased (INE, RGA, 2009).

Until Decree Law No 86/2010 came into force, four private organisations carried out periodic inspections of their members' application equipment through a voluntary scheme, under which 3 392 items of equipment are estimated to have been inspected.

3.2.4. Aerial application of plant protection products

The aerial application of plant protection products in Portugal is a common practice for large-scale crops such as cereals, maize, rice and some vegetable crops, such as tomato. Certain aspects of this application technique are assessed during the process of authorising and placing plant protection products on the market: an estimate is made of the potential exposure of the various environmental compartments, including watercourses, using simple demonstration models harmonised at Community level, and according to this estimate the risk of exposure to the product of the various non-target organisms is assessed. Depending on the results of this risk assessment, the aerial application of a product will only be authorised if it does not involve an unacceptable risk, bearing in mind the proposed use of the product concerned.

In accordance with the aerial application legislation, i.e. Law No 10/93 of 6 April 1993, in force until Law No 26/2013 was published, prior notice of aerial applications of plant protection products was given to the regional agriculture directorates and regional health authorities in the area concerned, the owners of land in these areas being notified by official notices affixed at least eight days in advance. With publication of Law No 26/2013, which repealed the above-mentioned Law and prohibited the aerial application of plant protection products as a general principle, except in limited cases, aerial operators have to be certified and have a specific qualification, and any applications must be authorised beforehand by the DGAV under a plant protection product Aerial Application Plan.

3.2.5. Environmental risks/accidents/incidents involving plant protection products

Due to their nature, plant protection products may cause serious poisoning or have other adverse effects on human health and the environment if they are handled without due care.

The unwanted presence of these products in the environment, particularly in water resources, may be caused by direct or point-source contamination arising from operations involving the preparation of mixtures and the filling of spray tanks or their washing after treatment, since these operations are usually carried out in a specific location on agricultural holdings. It may also be caused by accidental spillage during storage, incorrect disposal of packaging and surplus mixture or disposal in the soil, where they may also have a direct effect, by contact, on micro- and macro-organisms and on the maintenance of fertility.

A further cause may be diffuse contamination during the application of plant protection products as a result of spray drift through the inappropriate or incorrect use of products, and by the spreading of residues that remain in the soil, either by run-off to surface water or by leaching into groundwater.

In order to minimise point-source (including direct) and diffuse contamination of water resources and other environmental compartments such as soils, the use of products containing low-risk active substances rather than active substances classified as priority substances or as hazardous to aquatic organisms must be encouraged, while certain practices and techniques must be implemented or reinforced, such as the use of infrastructure allowing sound management of activities involving plant protection products and their residues and the respective packaging waste. Such practices, techniques or infrastructure should include the establishment of dedicated areas for preparing mixtures, filling spray tanks and cleaning equipment, the optimising of spraying equipment, devices and techniques to reduce surplus mixture and their immediate cleaning after use, and systems for treating waste mixture to

ensure its degradation and removal by appropriate management.

Recommendations and procedures currently exist which were established under the TOPPS project – ‘Train Operators to Prevent Pollution from Point Sources’. Their aim is to improve the management of contamination caused by plant protection product filling, cleaning and application operations, while at national level systems for managing surplus mixtures or water used to wash application equipment are yet to be generalised. Some systems recording positive results have already been installed on the ground, however, such as ‘biobed’ and ‘biofilter’ biological treatment systems, i.e. PHYTOBAC®, or physical treatment systems such as HELIOSEC®. Further work needs to be done in this area to generalise such practices, though the legal framework necessary for effective implementation must first be published.

3.2.6. Specific measures to protect the aquatic environment and drinking water

- **Risk mitigation measures**

In terms of assessing plant protection products with a view to their authorisation and placing on the market, measures to reduce the risks associated with their handling and application have been established to safeguard human health during such processes and when preparing and applying spray mixtures. In accordance with recommended agricultural practice, this also ensures that residues of the product, the active substance or their breakdown products do not endanger consumer health. It is also important to ensure that residues which persist in the environment do not have adverse effects on non-target organisms.

In this context and according to the degree of risk associated with the use of the product, mitigation measures have been defined to reduce exposure and thus the incidence of the expected adverse effects to acceptable levels. The recommended risk reduction measures imposed to ensure the safe use of plant protection products with a view to protecting the environment include the establishment of ‘buffer zones’ to protect the aquatic environment. This is recognised as the most important mitigation measure in the product authorisation process.

The expression ‘buffer zone’ has been used since the 1990s to refer to a zone or strip of land intended to protect an area which is vulnerable to external factors. These zones may be aquatic, land, or transitional, such as riparian areas, salt marshes, fens etc. When associated with plant protection products this concept refers to the establishment of strips of land beside watercourses to protect non-target aquatic organisms or the water resource because of its biodiversity or landscape importance, or because it is a source of drinking water, the expression ‘protection zone’ also being used in the latter cases.

Various factors influence the effectiveness and width of a buffer zone, including the slope of the land, precipitation, the type of soil and its permeability and the type of plant cover. The width of the protection strip is also determined by the resource it is intended to protect, with distances from watercourses as diverse as 10 m to stabilise riverbanks or 100 m to protect non-target organisms being known.

The first buffer zones associated with the use of plant protection products were defined according to the eco-toxicological profile of these products, the above-mentioned distances being established on the basis of the precautionary principle, with no basic technical-scientific support. However, the great variability between areas deemed to be vulnerable, the development of application techniques and equipment and progress in the use of methods for

estimating exposure to and assessing risks have also had an impact on the adoption of buffer zones.

In 2004 the FOCUS Working Group on Landscape and Mitigation Factors in Ecological Risk Assessment, set up with European Commission support, exhaustively surveyed the risk mitigation measures recommended by several Member States in the plant protection product authorisation process and found that the principal measure is to establish buffer zones, possibly in association with other measures and techniques to reduce watercourse exposure.

In addition to these zones, spray drift mitigation measures (anti-drift nozzles) are gradually being recommended in Portugal. These are now widely available on the market and the literature suggests they may lead to a 50 to 95% reduction in spray drift.

Risk mitigation measures, which have been established in Portugal since the 1980s, have developed in number and degree in line with technical and scientific progress, supported by an appropriate legal framework.

With respect to products authorised in Portugal whose use for the authorised agricultural practice is restricted through a mandatory safety area to protect aquatic organisms, the respective safety area or buffer zone varies from a minimum of 5 m for low-growing crops to 40 m for high-growing or arboreal crops.

It is nevertheless acknowledged, particularly in areas in which plots of agricultural land are mostly small, that it is difficult to comply with the recommended risk mitigation measures.

However, buffer zones, awareness-raising, training and the provision of advice to users in the context of integrated pest management systems are supported by other relevant measures: careful selection of the plant protection products to be used, compliance with conditions laid down on labels, appropriate storage of pesticides, correct preparation of mixtures in appropriate facilities, inspection and calibration of application equipment, preferential use of low-drift application equipment, correct disposal of pesticide packaging and surplus mixtures, and awareness-raising, training and the provision of advice to farmers, pesticide operators and agricultural technicians.

- **Quality of drinking water**

Information on the quality of drinking water is the responsibility of ERSAR [Water and Waste Services Regulatory Authority] (www.ersar.pt). This body publishes the results of the monitoring of drinking water on an annual basis, and the results of monitoring carried out in 2010 are available.

The analysis of data published (ERSAR, 2010) shows that the monitoring of drinking water quality has improved, both in terms of compliance with the mandatory frequency of sampling (very close to 100%) and with parametric values (virtually 98%), and the amount of good quality water has furthermore increased continuously in recent years, this indicator currently applying to 98% of water monitored.

According to ERSAR, the improvements recorded in water quality are enhanced by better controls, reflected in the various stakeholders' growing discipline in monitoring the implementation of legislation (ERSAR, management organisations, health authorities and laboratories), continuous improvements in the reliability of analytical results, performance of

virtually all the analyses imposed by legislation, and technical improvements in water abstraction and the analysis of regulatory parameters, which remain above 97% of the parameters to be tested, including plant protection products.

A total of 28 pesticides, including metabolites and breakdown compounds, are analysed by water management organisations. The pesticides controlled are usually 2,4-D, alachlor, atrazine and desethylatrazine, amitrole, bentazone, captan, cymoxanil, chlorpyrifos, chlortoluron, dimethoate, diuron, MPCA, metalaxyl, metribuzin, molinate, propanil, S-metolachlor, tebuconazol, terbuthylazine and desethyl-terbuthylazine, triclopyr, dithiocarbamates and propylene thiourea (a metabolite of propineb). Data for the period from 2009 to 2010 showed that in 2009, out of a universe of 224 samples, infringements were recorded in the established parametric values for dithiocarbamates at levels of 0.6 to 2.0 µg/l in 6 samples (parametric value of 0.5 µg/l for total pesticides), while only one sample presented levels of terbuthylazine of 0.11 µg/l (parametric value of 0.1 µg/l). Out of a total of 184 samples in 2010, infringements of parametric values were detected in 4 samples containing terbuthylazine and desethyl-terbuthylazine, with levels of 0.13 and 0.28 µg/l respectively, and linuron (1 sample) at a level of 0.19 µg/l.

The largest number of non-compliances occurs in the north of the country.

- **Implementation of ecological infrastructure and biodiversity maintenance**

The agricultural landscape has been shaped by human intervention in the form of crop or livestock production activities, which are highly geographically variable and constrained by climatic conditions, terrain and the availability and characteristics of natural resources. This has created a patchwork divided by natural or artificial structures such as hedges, walls and riparian galleries which ensure continuity between the different landscape elements, thus maintaining spaces/habitats with biological or landscape conservation value (vegetation and/or lake) which are important feeding, reproduction and refuge ecosystems for various species of resident and migratory fauna. It is therefore crucial to promote and protect these elements so that any negative impacts of the use of plant protection products are minimised and so that populations of affected organisms can be restored to natural levels over time.

Buffer zones for protecting other non-target organisms such as beneficial arthropods and susceptible plants are also currently recommended when products are being authorised, provided they are technically justified.

- **Agricultural and environmental practices**

Agricultural activity depends *inter alia* on the use and exploitation of natural resources, i.e. soil, water and air. This can have a negative effect on these resources, making the choice of production systems and the associated agricultural practices a key factor in preventing their degradation.

Voluntary soil and water conservation measures for farmers, drawn up in 1999 by the Ministry of Agriculture in the form of a soil and water conservation manual, have been defined in this context.

- **Code of conduct for the application of plant protection products**

The Code of Conduct for the Application of Plant Protection Products, hereinafter referred to

as the 'Code of Conduct', was drawn up by the DGAV in accordance with Article 20 of Decree Law No 173/2005 of 21 October 2005 and Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009, which establishes a framework for Community action to achieve the sustainable use of pesticides (currently in the process of publication).

This Code encompasses a range of guidelines or standards of conduct to be adhered to by all public and private stakeholders involved in any way in handling and applying plant protection products so as to ensure public health and environmental protection and the prevention of accidents.

The Code of Conduct should be used in parallel with current legislation on the placing of plant protection products on the market and supplementary legislation, and is intended to represent a standard for applying good plant protection practice and integrated pest management principles.

3.2.7. Handling and storage of plant protection products and management of packaging waste and surpluses

- **Management of packaging waste and surplus plant protection products**

Official data on the management of plant protection product packaging waste are provided by the only organisation licensed for that purpose, SIGERU, Lda, which created VALORFITO, the *Sistema Integrado de Gestão de Embalagens e Resíduos em Agricultura* [Integrated System for the Management of Agricultural Packaging and Packaging Waste].

SIGERU, as the management body for the integrated system, regulated by Decree Law No 366-A/97 of 20 December 1997, as amended, and by Order in Council No 29-B/98 of 15 January 1998, was licensed to manage plant protection product packaging waste from non-urban channels, particularly the agricultural sector.

This undertaking is responsible for the primary packaging waste of plant protection products with a capacity of less than 250 litres, regarded as hazardous according to the European Waste list (Order in Council No 209/2004 of 3 March 2004).

Secondary and tertiary packaging for plant protection and other agricultural products, such as fertilisers, is excluded from this integrated system, under which producers of plant protection products must pay the management organisation a contribution (ECOVALOR), determined by the weight of packaging placed on the market, to fund the management costs associated with such waste.

Packaging waste is brought together in collection centres distributed geographically by agricultural region in accordance with the terms of the licence. Except for the Autonomous Region of Madeira, where VALORFITO has not yet been introduced, the number of collection centres is currently greater than the number required under the SIGERU licence: at the end of 2012 the total number of active collection points stood at 682.

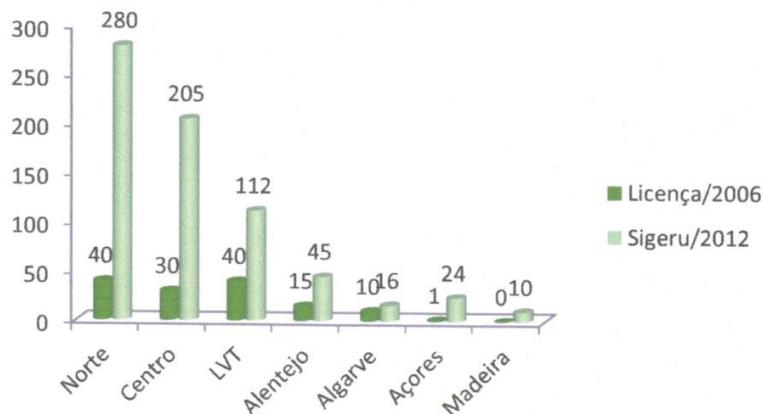
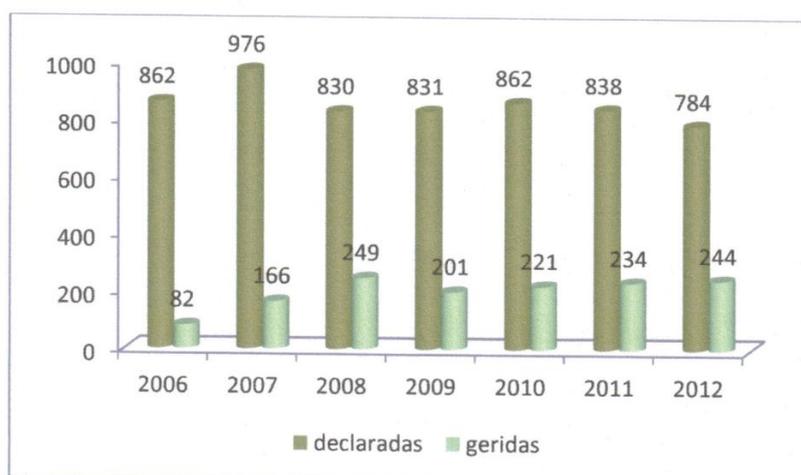


Fig. 3.2.4 – No of active collection centres at end-2012 and minimums per Agricultural Region established in the licence issued in 2006 (Sigeru/VALORFITO)

Over 95% of the total weight of packaging received in collection centres is made up of items with a capacity equal to or greater than one litre. These data were collected by VALORFITO (Murta, 2010) through surveys carried out in 2010 involving 1 500 people who visited points of sale to purchase products and/or hand over packaging waste.

On the basis of information provided by VALORFITO in its annual activity reports, the figure below shows the quantities of packaging declared and packaging waste managed by this management body.

Since the system was introduced in 2006, the quantity of waste collected doubled from 2006 to 2007, increased by 50% from 2007 to 2008 and fell by 19% from 2008 to 2009. In 2010 there was an increase of 10% compared to 2009, followed by an increase of 5% from 2010 to 2011, corresponding to a collection rate of 28% (VALORFITO, António Lopes Dias, staff committee). Data for 2012 point to a 6.2% fall in packaging declared compared to 2011. The management organisation estimates, however, that VALORFITO should rise by 3% to over 240 tonnes under management, the collection rate rising to around 31%. The quantity of packaging placed on the market has also remained largely constant over the years, with a peak only in 2007. All this waste was sent for recycling.



declaradas	declared
geridas	managed

Fig. 3.2.5 – Quantities of packaging declared and packaging waste managed by the licensed management system between 2006 and 2011 (SIGERU/VALORFITO)

- **Storage of plant protection products on agricultural holdings**

Correct plant protection product storage and appropriate stock management helps to reduce the risk of accidents involving these products and the amount of obsolete product waste on holdings, which has high potential for environmental contamination. Since the implementation of Decree Law No 173/2005, which created the legal basis and technical framework for the appropriate management of plant protection products on agricultural holdings, voluntary technical guidelines have been introduced on their correct storage on holdings.

In the context of the mandatory measures to be observed, regulated by the scheme for monitoring cross-compliance, the requirement to monitor the indicator of plant protection product storage on holdings is mandatory and triggers penalties if not complied with.

Farmers' attitudes and conduct in relation to the appropriate storage of products on the holding have therefore generally developed positively.

IFAP figures in this area demonstrate a non-compliance rate for this indicator of 1.06% in 2009, 0.29% in 2010 and 0.43% in 2011.

3.2.8. Sustainable production and protection

Developments in integrated pest management, integrated production and organic production in Portugal, contrary to other European countries, was slow during the 1980s and early 1990s, while in 1994, the year of implementation of Regulation (EEC) No 2078/92 of 30 June 1992, there were only three farmers' organisations (AAIPM¹, APAS² and AVAPI³) providing

¹ Associação de Agricultores para Produção Integrada de Frutos de Montanha.

² Associação dos Produtores Agrícolas de Sobrena.

³ Associação para a Valoração Agrícola em Produção Integrada.

advice to farmers on implementing integrated pest management. These organisations covered an area of around 300 ha of pome fruit cultivation.

The implementation of the measures in groups I and IV of the above Regulation did much to encourage the start-up of integrated pest management, integrated production and organic production at national level. The purpose of the group I measures was to reduce the polluting effects of agriculture by awarding aid to farmers who sought to pursue such practices, while the group IV measures enabled demonstration fields to be developed and specific training to be provided on this protection method.

The approval of Regulation (EEC) No 2078/92, Agro-environmental Measures, introduced the requirement to establish standards for engaging in integrated pest management and production in Portugal.

A legislative framework was drawn up in this respect which included Decree Law No 180/95 of 26 July 1995 and supplementary legislation, subsequently consolidated by legislation on the approval of technicians for organic production and giving rise to Decree Law No 256/2009 of 24 September 2009, as amended by Decree Law No 37/2013 of 13 March 2013.

As provided for in the above legislation, documents supporting the pursuit of integrated pest management and production were drawn up, i.e.:

- lists of plant protection products recommended in integrated pest management;
- lists of economic damage thresholds to be identified in integrated pest management;
- record books to be used in integrated pest management and production;
- fertilisation plans and cultivation practices for various crops.

According to the prevailing legislation, until 2007 farmers had to be members of a farmers' organisation recognised in the area of integrated pest management and production and had to undergo training in that field in the first year of membership to be able to engage in these activities. The farmers' organisation was responsible for contracting approved technicians to provide its members with technical assistance throughout the growing cycle.

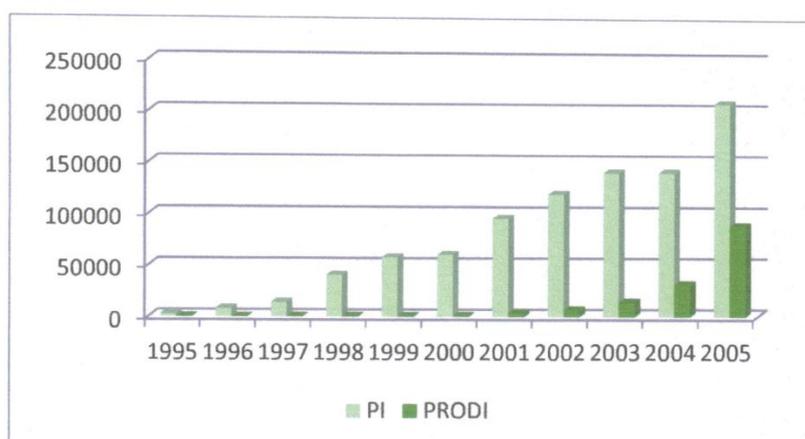
In late 2007 some 150 farmers' organisations employing around 550 technicians approved to provide technical assistance in integrated pest management and/or integrated production for various crops were recognised (Table 3.2.6). Vines attracted the greatest number of farmers, 44.5% in integrated pest management and 39.7% in integrated production, apparently due to the size and significance of this crop in Portugal.

Table 3.2.4 – Crops under integrated pest management (IPM) and integrated production (IP) in 2007

Crop	IPM	IP
Avocado	√	√
Actinidia	----	√
Rice, maize and autumn/winter cereals	√	√
Citrus fruit	√	√
Fig and nuts	√	----
Fruiting vegetables	√	√
Oil fruits	√	----
Olives	√	√
Grazing and forage	----	√
Pome fruits	√	√
Stone fruit	√	√
Sorghum	----	√
Vines	√	√

In 2005, when new applications were still being recorded, the 150 recognised farmers' organisations provided technical assistance over a total area of around 300 000 ha, some 208 000 ha of which were under integrated pest management and 88 000 ha under integrated production (Fig. 3.2.6).

Because the number of farmers involved in integrated pest management had risen exponentially, many specialists considered its implementation to be successful.



PI	IPM
PRODI	IP

Fig. 3.2.6 – Annual development of areas under integrated pest management and integrated production, 1995-2005

The approval of Council Regulation (EC) No 1698/2005 of 20 September 2005 on support for rural development by EAFRD and the adoption of the Community strategic guidelines defined in Decision 2006/144/EC of 20 February 2006 provided the framework for the national rural development programme for 2007 to 2013.

Portugal drew up its **National Strategic Plan (NSP)** for agriculture and rural development on the basis of Community strategic guidelines. The purpose of the plan was to ‘promote the sustainable competitiveness of the agroforestry sector and rural areas’.

New rules were introduced to implement the NSP, a considerable decrease being recorded in

the number of parties involved in integrated pest management and integrated crop production (farmers' and technicians' organisations). This appeared to be due on the one hand to the fact that integrated pest management was no longer eligible for financial support, and on the other to the fact that farmers no longer had to belong to the recognised organisations, having the option to engage in integrated production (the only system granted financial support) with or without technical support. This was demotivating for farmers because it was difficult for them to comply with the requirements of this production method.

Out of the 150 farmers' organisations existing in 2007, only around 20% are currently in operation, mainly in the Lisboa e Vale do Tejo and Centre regions, providing technical assistance on the integrated production of vegetables, pome fruit, stone fruit and vines.

According to IFAP data, based on applications to PRODER – Agro-environmental Measures – Alteration of Agricultural Production Methods, areas applying for the IP Measure – Integrated Production – were as follows from 2008 to 2012 (unit: 000 ha):

Table 3.2.5 – Areas applying for the IP Measure – Integrated Production

2008	2009	2010	2011	2012
104.4	221.3	310.2	363.3	362.1

Recognition of technicians for providing technical assistance in integrated pest management, integrated production and organic production continued to be ensured by the DGADR, and an official database existed of technicians who were recognised to have skills in providing technical support in these fields, albeit on an optional basis. This database is published on the DGADR website, around 200 technicians currently being recognised for providing technical support in integrated pest management and integrated production (plants) and 130 in organic production.

IV. Glossary

EFSA – European Food Safety Authority

APA – Agência Portuguesa do Ambiente, I.P. [Portuguese Environment Agency]

ASAE – Autoridade de Segurança Alimentar e Económica [Food Safety and Economic Security Authority]

CIPP – Centro de Inspeção Periódica obrigatória de equipamentos de aplicação de Produtos fitofarmacêuticos [Centre for the Mandatory Periodic Inspection of plant protection product application equipment]

DGADR – Direção-Geral de Agricultura e Desenvolvimento Rural [Directorate General for Agriculture and Rural Development]

DGAV – Direção-Geral de Alimentação e Veterinária [Directorate General for Food and Veterinary Affairs]

DGS – Direção-Geral de Saúde [Directorate General for Health]

DRAPs – Direções Regionais de Agricultura e Pescas [Regional Agriculture and Fisheries Directorates]

PPE – Personal Protective Equipment

ERSAR – Entidade Reguladora de Sistemas de Águas e Resíduos [Waste Disposal and Water Distribution Regulatory Authority]

FAQ – Frequently Asked Questions

FNAP – Federação Nacional dos Apicultores de Portugal [National Federation of Portuguese Beekeepers]

GPP – Gabinete de Planeamento e Políticas [Planning and Policy Bureau]

IFAP – Instituto de Financiamento da Agricultura e Pescas, I.P. [Agriculture and Fisheries Financing Institute]

INAC – Instituto Nacional de Aviação Civil, I.P. [National Institute of Civil Aviation]

INE – Instituto Nacional de Estatística, I.P. [National Statistics Institute]

INIAV – Instituto Nacional de Investigação Agrária e Veterinária, I.P. [National Agricultural and Veterinary Research Institute]

MRL – Maximum Residue Levels

OP – Organic Production

EDA – Economic Damage Threshold

QS – Quality Standard

EQS – Environmental Quality Standard

CAP – Common Agricultural Policy

NAP – National Action Plan

PPP – Plant Protection Product

IPM – Integrated Pest Management

NRCP – National Residue Control Plan

IP – Integrated Production

AR – Autonomous Region (Madeira and the Azores)

MR – Mutual Recognition

Y/N – Yes/No

SAA – Serviço de Aconselhamento Agrícola [Agricultural Advisory Service]

SNAA – Serviço Nacional de Avisos Agrícolas [National Agricultural Information Service]

VALORFITO/SIGERU – Sistema Integrado de Gestão de Embalagens e Resíduos em Agricultura, Lda. [Integrated System for the Management of Agricultural Packaging and Waste]