

---

# 2.6

# AGRICULTURE



Following the 1997 Treaty of Amsterdam, which confirmed sustainable development as one of the aims of the EU, and above all since the European Council meeting in Cardiff in 1998, consideration has been given to the inclusion of environmental issues in all community policy, including agriculture. Reform of the Common Agricultural Policy (CAP) in 2003 underpinned the action begun with Agenda 2000 (1999), establishing new measures to achieve the goal of integrating the environmental dimension: quality and balanced use of water, reducing risk in agri-chemical products, reducing soil degradation, climate change and air quality, as well as preservation of the landscape and biodiversity.

One of the Reform's key aspects is "conditionality", which makes full payment of CAP direct aid dependent on compliance with certain basic environmental requirements: food safety, animal health and welfare, and good agricultural and environmental conditions. The 2003 Reform also broke the link between production and most direct aid, reducing incentives for the intensification of agriculture.

This approach also extends to the policies spearheaded in Spain by the Ministry of Agriculture, Fisheries and Food (MAPA - *Ministerio de Agricultura, Pesca y Alimentación*) in partnership with the country's Autonomous Communities and supported by European Agricultural Guidance and



Guarantee Fund (EAGGF) finance. Among the key actions are: Agri-environmental Measures, Afforestation of Agricultural Land and the National Irrigation Plan (PNR - *Plan Nacional de Regadíos*).

- The Agri-environmental Measures aim to achieve a sustainable and multifunctional agricultural model. They were implemented during the period 2000-2006 as part of the MAPA's Horizontal Programme of Accompanying Measures (*Programa Horizontal de Medidas de Acompañamiento*), and focus their objectives on five areas: water, soil, natural hazards, biodiversity and landscape. The measures undertaken range from the

INDICATOR	GOAL	TREND
<b>Fertiliser consumption</b>	Reduce fertiliser consumption	In 2005 consumption fell by 15%
<b>Phyosanitary product consumption</b>	Reduce consumption of phyosanitary products	After the major increase in 2004, there has been a substantial decrease in phyosanitary product consumption
<b>Organic farming</b>	Increase proportion of organic farmland to total farmland	The total area devoted to organic farming rose by 10% on the previous year
<b>Irrigated area</b>	Introduce more efficient irrigation systems	There was an increase nationally, with some Autonomous Communities showing an upward trend, and others a fall
<b>Eco-efficiency in agriculture</b>	Increase the economic value of agricultural production, reducing pressures on the environment	Over the period 2000-2004, the sector's GVA (at constant prices) fell by 3.2%

## 2.6 AGRICULTURE

promotion of extensive farming in cereal-growing regions to water savings in irrigation, including also protection of the landscape and practices intended to prevent fires.

- The Afforestation of Agricultural Land scheme forms part of the MAPA's Horizontal Rural Development Programme (*Programa Horizontal de Desarrollo Rural*), and applies throughout most of the country, the exceptions being the Basque Country and Navarre. During 2005, 2,530 reforestation programme payouts were made in Castile-La Mancha (1,133), Castile-Leon (750), Aragon (276), Extremadura (214), Madrid (43), Galicia (41), Cantabria (41), the Canary Islands (28) and Rioja (4). Payments were also made during 2005 for the 1993/1999 programme, covering almost 8,000 cases.
- The National Irrigation Plan, approved in 2002 and applicable until 2008, is being developed to optimise water resource use. According to the latest figures from the MAPA, by the end of 2005 more than half a million hectares (542,688) had received attention, leading to water savings of 2,850 hm<sup>3</sup>. Actions under the PNR have largely been implemented through State-owned Agricultural Infrastructure Corporations (SEIASAS - *Sociedades Estatales de Infraestructuras Agrarias*).

The indicators presented in this chapter monitor the area devoted in Spain to irrigated crops, as well as other such major environmental issues as fertiliser and phytosanitary product consumption and the introduction of organic farming. An indicator measuring eco-efficiency in the sector is also included.

As is well known, the main cause of diffuse-source water pollution is use of agricultural nitrates, including chemical fertilisers. In addition, poor use of phytosanitary products has a negative impact on the environment and human and animal health. The figures for these indicators show a reduction in consumption in both cases, although with no single decisive cause, apart from the influence of meteorological conditions, and no clear trend emerging.

As regards irrigation, the area employing this agricultural practice remained steady in 2005, representing 13.6% of all arable land, a similar figure to 2004. In absolute terms there was an increase of 42,185 hectares from 3,354,416 hectares in 2004 to 3,396,601 hectares in 2005, according to figures from the "Crop Area and Yield Survey" (*Encuesta sobre superficies y rendimientos de cultivos*) carried out by the MAPA. There was a corresponding decrease in dry-farmed land, of around 11,906 hectares.

Meanwhile, organic farming continues to expand, with an additional 74,386 hectares in 2005, an increase of 10% on 2004.

## The Irena Project

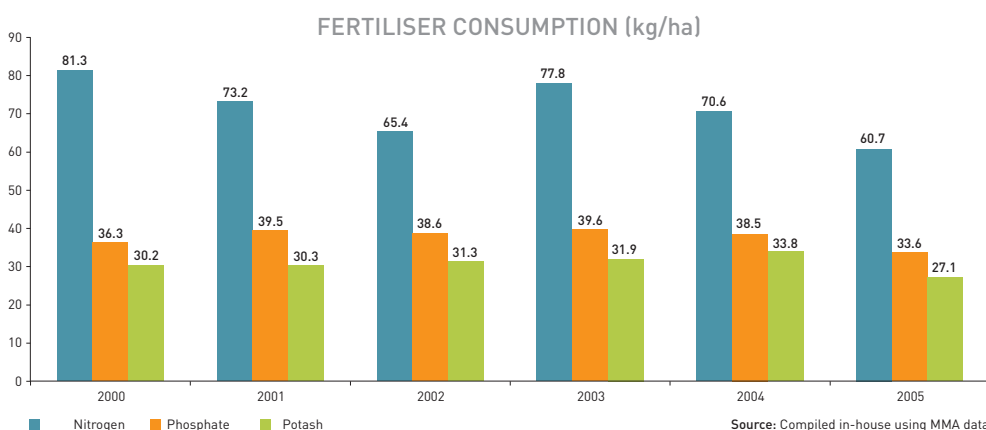
The IRENA project, coordinated by the European Environment Agency, has developed 35 agri-environmental indicators to monitor the integration of environmental considerations in the agricultural policy of the EU15. The results illustrate the major impact which agriculture has on soil and water resources: agriculture is responsible for 50% of water consumption in southern Europe, and 50% of all nitrogen pollution in rivers. It is also responsible for 10% of greenhouse gas emissions and 94% of ammonia emissions.

The report also highlights the fact that extensive farming practices can have a positive impact on protecting biodiversity, as shown by the indicator for Natura 2000 Network areas: a large proportion of habitats in such areas (in particular mountainous and Mediterranean regions) depends on the continuance of extensive farming practices. This situation highlights the possibility of improving the overlap between Natura 2000 Network areas and the introduction of agri-environmental measures to underpin synergies and so achieve CAP objectives.

Source: EEA, Briefing 2006/01.  
Further information: <http://webpubs.eea.eu.int/content/irena/index.htm>

## Fertiliser consumption

Following the trend which began in 2000, fertiliser consumption fell in 2005



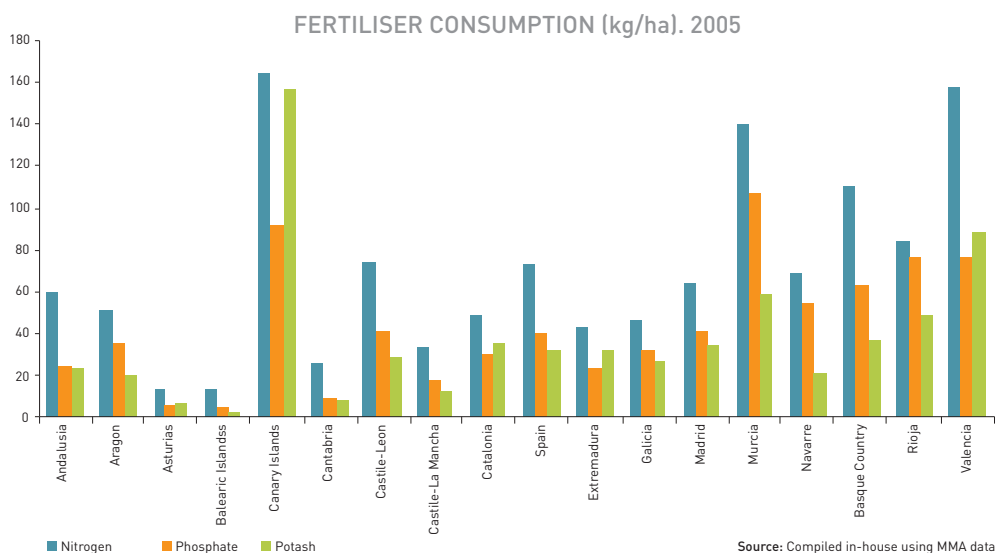
Chemical fertilisers are industrial products containing nutrients given to plants to optimise growth and increase crop yields. They are generally applied to the soil and are then absorbed in diluted form by crops, providing the main nutrients required for crop development (nitrogen, phosphorus and potash), secondary nutrients (calcium, sulphur and magnesium) and even micronutrients such as boron, manganese, iron, zinc and others.

The worldwide trend has been a constant increase in their use over the last 60 years, with the quantity applied multiplying eightfold since the middle of the last century. This has been accompanied by an increase in crop yield. Demographic growth forecasts and reductions in the agricultural labour force make it unlikely that chemical fertilisers will be replaced by organic fertiliser, although consumption per hectare could fall as a result of more efficient use.

The indicator measures intensity of chemical fertiliser use in agriculture (defined as the quantity used per unit of fertilisable area), and the potential pressure which this farming practice exerts on the environment. It should be remembered that the possible damage caused to the environment by such fertiliser depends not only on quantity but also on conditions within the agrarian ecosystem, crop type and the farm management methods applied. The excess use of nitrogen and phosphate fertilisers is a result of poor use of available resources and can cause severe pollution of inland and marine waters. The indicator does not therefore measure damage caused to the environment, this being assessed by other parameters, but does monitor consumption.

Fertiliser consumption in Spain fell from 147.8 kg/ha in 2000 to 121.5 kg/ha in 2005, a fall of 18% over the period examined. Between 2004 and 2005 it decreased at a rate of 15%.

According to the Spanish Ministry of Agriculture, Fisheries and Food, rising product prices combined with adverse weather conditions during the last two years, with a notable reduction in rainfall, may have influenced demand, and this should therefore not necessarily be seen as a trend but simply a response to immediate circumstances. As regards reductions by type, in 2005 use of potash products fell by 20.3% on 2004, nitrates by 14.4% and phosphates by 13.1%.



The Canary Islands continue to head the list for total consumption in 2005 with 412.1 kg/ha, followed by Valencia (321.9), Murcia (305.1), the Basque Country (209.4) and Rioja (207.1). Nine Autonomous Communities are below the average level for Spain (121.5 kg/ha), with the lowest rungs being occupied, for reasons connected with their particular agriculture, by the Balearic Islands, Asturias, Cantabria and Castile-La Mancha. In the case of the Canary Islands, it is important to bear in mind firstly the lack of arable land area (35,910 hectares) and, secondly, the high potash fertiliser consumption (155.9 kg/ha) resulting from the specific needs of crops such as tomatoes and bananas.

Spain's use of fertilisers cannot be seen as excessively intense compared with the rest of the EU15. Nonetheless, agriculture continues to be the greatest source of nitrate pollution, and improper or excessive use of fertilisers can cause alterations to the environment. An overall reduction in fertiliser consumption therefore continues to be a priority

## 2.6 AGRICULTURE

environmental objective, the aim being to break the link between increased use and agricultural output. Decreasing effectiveness of fertiliser use is due to poor practice, although it is still possible to reverse the current situation by further extending good practice among farmers.

In fact, more than 6 million hectares in Spain have been declared as vulnerable areas where strict Action Programmes must be followed in order to reduce quantities of leached nitrates. Each Autonomous Community has also published a Code of Good Agricultural Practice regarding nitrogen fertiliser use as part of compliance with the Nitrates Directive (Directive 91/676/EEC). Control of fertiliser use is also an important element in other production systems, such as Integrated Production (accounting for some 300,000 hectares) and Organic Farming.

To put the figures revealed by the indicator into context, it need only be remembered that, according to FAOSTAT, in 2003 fertiliser consumption (nitrogen, phosphate and potash) per hectare of arable land stood at 92.34 kg/hectare and 22.72 kg *per capita* worldwide. In the EU15, consumption stood at 174.12 kg/ha and 38.06 kg *per capita*, with Ireland the biggest consumer. The same source indicates that consumption in Spain was 115.40 kg/ha and 52.71 kg *per capita* for the same year.

### NOTES

- Fertilisable area is defined as arable land (excluding fallow and other unoccupied land), as well as natural grasslands, in accordance with the "Crop Area and Yield Survey" produced by the Spanish Ministry of Agriculture, Fisheries and Food.

### SOURCES

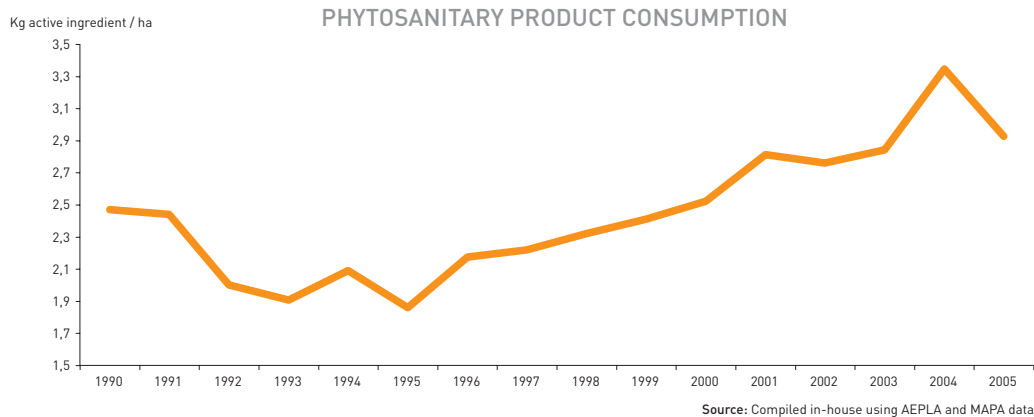
- "Crop Area and Yield Survey", various years, Spanish Ministry of Agriculture, Fisheries and Food (*Ministerio de Agricultura, Pesca y Alimentación*).
- "Agriculture, Fisheries and Food in Spain 2005" ("*La agricultura, la pesca y la alimentación en España 2005*"). Spanish Ministry of Agriculture, Fisheries and Food.
- "Facts and Figures on Agriculture, Fisheries and Food in Spain" ("*Hechos y cifras de la agricultura, la pesca y la alimentación en España*"). Documentation and Information Department of the Technical Secretariat General (*Area de Documentación e Información de la Secretaría General Técnica*). Spanish Ministry of Agriculture, Fisheries and Food. Updated figures available from the website.
- Agri-Food Statistical Yearbook 2004 (*Anuario de Estadística Agroalimentaria-2004*). Spanish Ministry of Agriculture, Fisheries and Food.
- "Environment at a Glance: OECD Environmental Indicators, 2005. Agriculture". Intensity of use of nitrogen and phosphate fertilisers. Apparent consumption per km<sup>2</sup> of agricultural land, p. 128-129.

### FURTHER INFORMATION

- [www.mapa.es](http://www.mapa.es)

## Phytosanitary product consumption

In 2005 phytosanitary product consumption fell by 12.69% on 2004, the highest year ever



Phytosanitary products<sup>(1)</sup> (also known as pesticides) include a range of substances intended to protect the health of plants and harvested produce. Their effectiveness in the fight against pests and competition from weeds brings undeniable financial advantages due to their positive impact on crop yields. They contribute to the quality, reliability and improved prices of agricultural products and are therefore widely used in farming.

However, their use involves risk since most of these products have intrinsic properties which make them harmful to health and the environment if they are not handled and applied correctly.

The indicator shows consumption of phytosanitary products in proportion to agricultural land, using figures from the Spanish Plant Protection Association (AEPLA - *Asociación Empresarial para la Protección de las Plantas*). The agricultural land treated with such products includes herbaceous and ligneous crops, but excludes fallow and other unoccupied land, as well as natural grasslands. The figures for this area of use are relatively stable, and are drawn from the “Crop Area and Yield Survey” series, published by the Spanish Ministry of Agriculture Fisheries and Food, revealing a 13% drop since 1990 to a level of 14,158.36 thousand hectares in 2005.

Between 1995 and 2005, use of phytosanitary products rose by 70.34%, thus reversing the strong downward trend started at the end of the 1980s. Although at first the

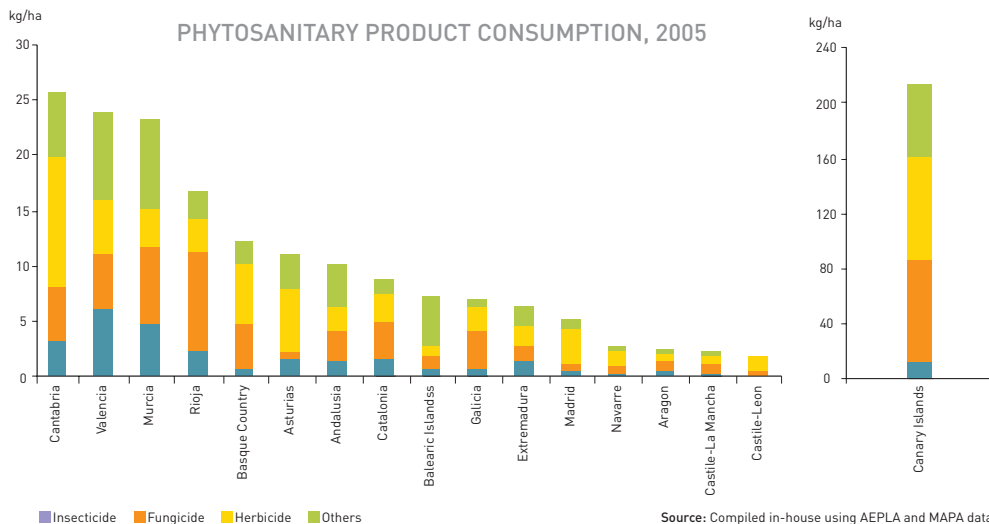
(1) There is a wide range of such products: insecticides, fungicides, herbicides, pesticides, which include acaricides, nematocides, phyto regulators and molluscicides.



## 2.6 AGRICULTURE

application of the 1992 Common Agricultural Policy (CAP) reforms partially contributed to a drop in their consumption, agricultural intensification and, above all, the fact that they have become more specific and effective, have aggravated the problem as both consumption and toxicity are increasing.

In absolute terms, 1995 marked the low point of consumption in the 1990s (27,852 tonnes of active ingredient), but was followed by a sharp rise in subsequent years up until 2004, when consumption stood at 47,445 tonnes. The most recent figures, for 2005, again show a downward trend, with consumption falling by 6,023 tonnes compared with the previous year (equivalent to a 12.6% fall in kg/ha). In general terms, consumption of phytosanitary products and the area treated reveal a divergent trend: greater use over a smaller area.



Inequalities in the intensification of agriculture between Autonomous Communities is also reflected in phytosanitary product use, which is much higher in the Canary Islands (over 200 kg/ha) Cantabria, Valencia, Murcia and Rioja.

## FRAMEWORK DIRECTIVE ON SUSTAINABLE USE OF PESTICIDES

Use of phytosanitary products is governed by European and Spanish legislation in order to ensure correct application and so help minimise any possible damage caused to the environment and the health of people and animals. The legislative framework governing the use of such products (Maximum Residue Limits, or MRLs) is Directive 91/414/EEC, and in Spain, Royal Decree 280/1994 (*RD 280/1994*). This legislation establishes the conditions for approval of phytosanitary products and control of their use through the permitted Maximum Residue Limits for agricultural products. This system thus protects consumers and establishes the basis for a single, standardised market within the European Union. It also offers farmers the guarantee that, by properly applying phytosanitary products within the permitted limits, their produce will be accepted on the market.

On 12 July 2006 the European Commission proposed a new regulation for phytosanitary products with the aim of simplifying procedures for the authorisation of such substances and harmonising availability across the Member States. This legislation, which is seen as a thematic strategy, is intended to achieve greater effectiveness in protecting human health, animal welfare and the environment through rigorous analysis of substance characteristics, such as, for example, their persistence in the environment. One further feature of this proposal is that it supports comparative assessment and replacement of certain substances by others which offer greater safety levels. Monitoring measures are meanwhile being intensified, with the parties involved, including farmers, required to maintain a record of the substances they use, and to make this available, whenever requested, to local residents and the authorities responsible for drinking water quality. The Framework Directive on the Sustainable Use of Pesticides will come into effect in 2008.

### NOTES

In calculating the indicator, "area treated with phytosanitary products" is taken as the total area of arable land, excluding fallow and other unoccupied land (in other words, the area made up solely of herbaceous and ligneous crops), treated with this type of product.

### SOURCES

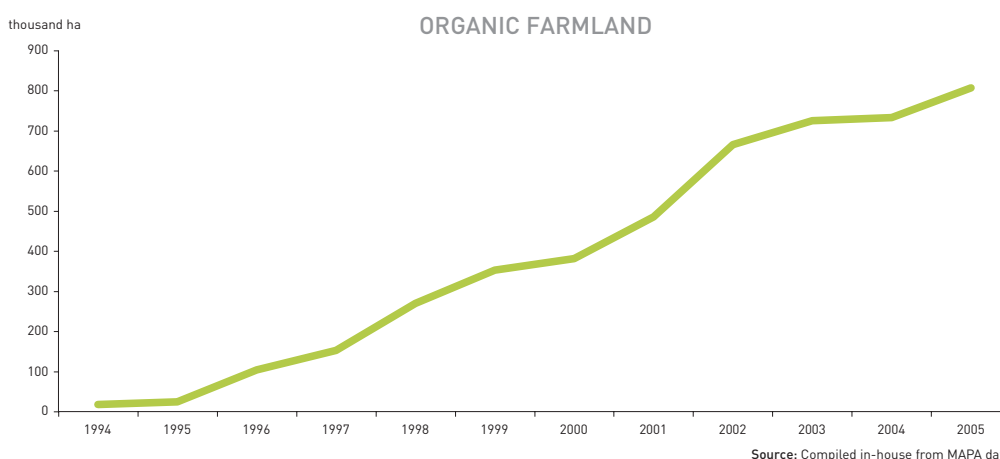
- Phytosanitary Products: Spanish Plant Protection Association.
- Treated area:
  - Crop Area and Yield Survey 2005. Spanish Ministry of Agriculture, Fisheries and Food.
  - Agri-Food Statistical Yearbook. Various years. Spanish Ministry of Agriculture, Fisheries and Food.

### FURTHER INFORMATION

- [www.mapa.es](http://www.mapa.es)
- [www.aepla.es](http://www.aepla.es)

## Organic farming

After having stalled slightly, the area of organic farmland in Spain is now rising again, growing by 10% in 2005 compared to 2004



The fundamental aim of organic farming is to obtain maximum quality foodstuffs while respecting the environment, maintaining the fertility of the land and excluding the application of synthetic chemical products, thereby ensuring sustainable agricultural and livestock development. Organic farming thus has a role in rural development, environmental protection and biodiversity preservation. From a financial perspective, it is estimated that commercial production amounted to almost 173 million euros in 2002.

Since 1991, organic farming has been governed by EEC Regulation 2092/91 (later supplemented by EC Regulation 1804/99 to include organic livestock farming). An action plan was presented in 2004 to promote the development of this type of production in the EU and it was later considered necessary to adopt a new legislative approach in order to ensure its application<sup>(2)</sup>.

The indicator shows the area devoted to this type of farming in Spain. Since 1991 (4,235 hectares) the area devoted to organic farming has multiplied 190 times. However, the rate of growth slowed from 16% (in 2002) to just 1.09% (2004). There was a fresh upturn in 2005 to a level of 74,386.9 ha, an increase of 10% compared with 2004. In 2005 total

(2) "Proposal for a Council Regulation on organic production and labelling of organic products". (21/12/2005).

organic farmland covered 807,569.27 ha, distributed in three broad categories, as shown in the table below:

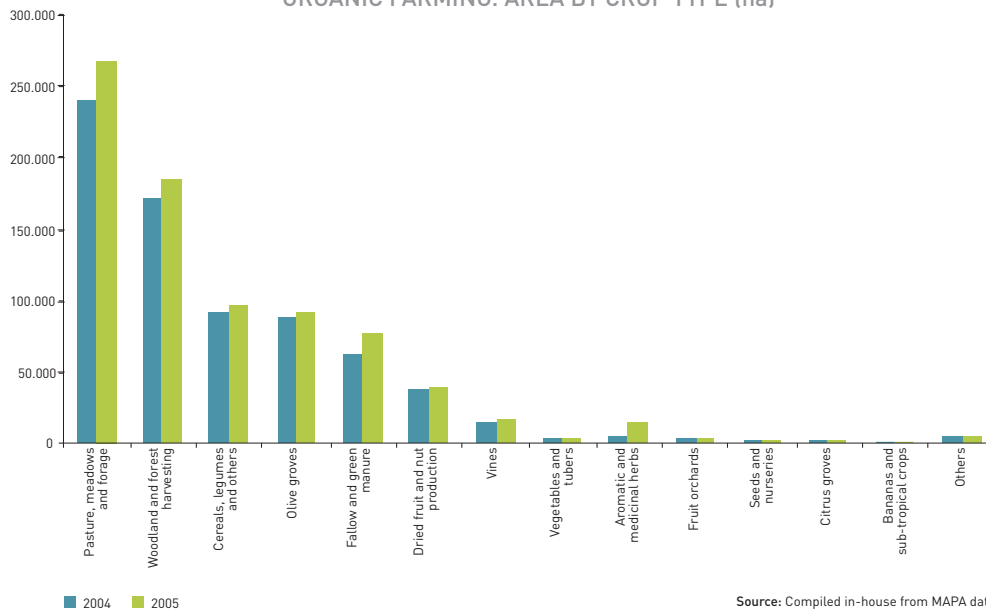
DISTRIBUTION OF ORGANIC FARMLAND BY CROP TYPE 2005

Organic farmland, orchards and others (ha)	%	Pasture, meadows and forage (ha)	%	Woodland and forest harvesting (ha)	%	Total organic farmland (ha)	%
354,522.33	43.89	268,239.47	33.21	184,807.02	22.88	807,569.27	100

Source: Compiled in-house using MMA data (2005)

Organic farmland made up 2% of all arable land in Spain in 2005. Among the crops (apart from the area devoted to pasture, meadows and forage and woodland and forest harvesting), the areas devoted to cereals, legumes and others (96,313.54 ha), olives (91,485.20 hectares) and dried fruit and nuts (41,360.37 hectares) are of particular significance.

ORGANIC FARMING. AREA BY CROP TYPE (ha)



Source: Compiled in-house from MAPA data

The graph shows an increase in organic farmland devoted to all crop types, except bananas and sub-tropical crops, vegetables, tubers and fruit orchards.

Meanwhile, the sector's working population, a key factor in measuring the social returns of this business, stood at 17,509, of whom 15,693 were organic crop and livestock farmers, 1,816 were engaged in processing and marketing, and the remaining 52 were importers. The highest number of registered workers (18,505) was recorded in 2003.

## 2.6 AGRICULTURE

Organic production has seen huge growth in Europe since the introduction of the Regulation in 1991 and this agricultural sector's contribution continues to grow in most Member States. In 2003, the number of companies registered as organic or in the conversion process within the EU25 stood at 142,375, representing 1.4% of all agricultural companies. The area devoted to organic farming covered around 5.7 million ha, or 3.5% of utilised agricultural area.

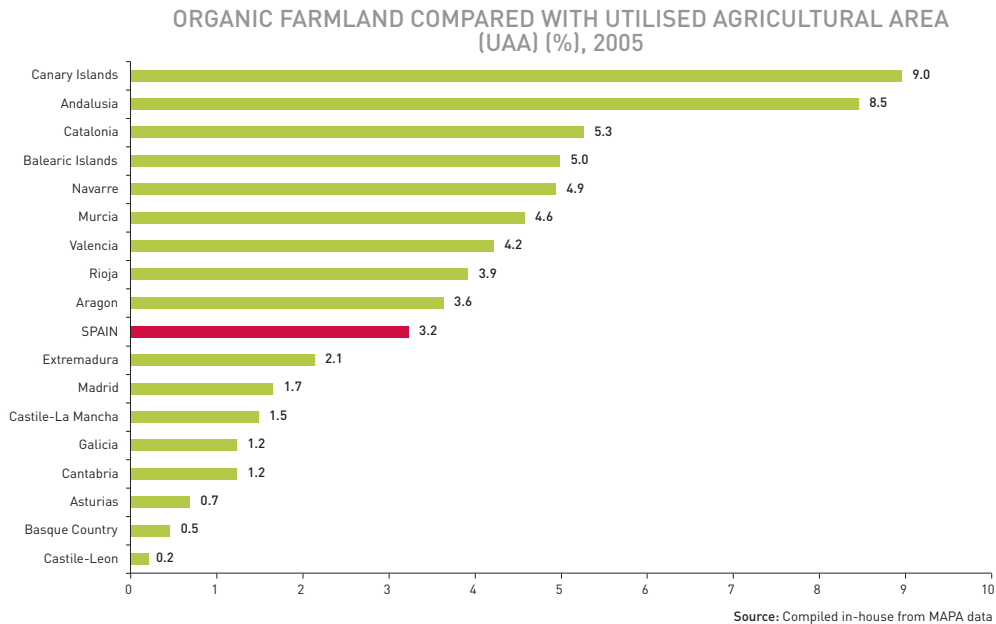
Despite organic farming's appreciable development over recent years, underpinned in particular by demand from the European market and the introduction of agri-environmental aid, it has nonetheless been held back by limited domestic demand. In order to find out why organic produce made up such a limited proportion of the domestic market, the Spanish Ministry of Agriculture, Fisheries and Food produced a study in 2005 into consumption of organic produce<sup>(3)</sup>.

The results of the study indicate that among consumers, 72.5% of those surveyed are aware of such products, associating them with natural foodstuffs (41%), a healthier diet (29.7%), as produced without chemical pesticides (25.9%), and also as being more expensive (19.7%). The reasons why the Spanish do not consume organic produce despite being aware of it come in the following order: lack of information, organic produce is not easily available, the price is higher, they see no benefits compared with conventional products or do not believe they are truly organic.

Among retailers, 47.3% sell organic produce, and the remainder do not. Among the latter, the main reasons for not stocking organic products in their outlets are: lack of demand (75%), difference in price compared with traditional products (17.1%) and the fact that their traditional suppliers do not provide them (17.1%). The conclusions of the study are that, despite widespread awareness about organic food and a generally positive view of it, demand in Spain continues to be low as a result, above all, of the price difference when compared with traditional products.

The MAPA has introduced an Action Plan with the aim of generating an impact on the market for organic produce by: promoting the development of organic farming, improving awareness and promoting commercial sale and consumption, improving coordination and administration of resources and, ultimately, the underlying structure of the sector.

(3) The MAPA's Agri-Food Consumption and Distribution Monitoring Centre (*Observatorio del Consumo y la Distribución Agroalimentaria*) surveyed 2,000 consumers and 100 food retailers in the final quarter of 2005 in order to assess consumers' opinion about organic produce.



With regard to the distribution of organic farming across the Autonomous Communities, Andalusia leads the way in terms of absolute figures with 403,361.15 ha, followed a long way behind by Aragon (74,219.66 ha), Extremadura (67,378.53 ha), Castile-La Mancha (64,691.13 ha), Catalonia (54,188.49 ha) and Valencia (30,793.71 ha). The above graph shows the percentage of Utilised Agricultural Area devoted to organic farming in each Autonomous Community.

### PROPOSAL FOR A COUNCIL REGULATION ON ORGANIC PRODUCTION AND LABELLING OF ORGANIC PRODUCTS

In 1991, Council Regulation (EEC) 2092/91 set up the first European framework for organic foodstuffs and agricultural produce. Over a decade later, the Commission has begun the process of reviewing this framework. The new regulations, now within the context of the EU27, will include aquaculture practice in addition to traditional agricultural, livestock and harvested produce. Towards the end of 2005, the Commission of the European Communities presented its “Proposal for a Council Regulation on organic production and labelling of organic products”, the text of which sets out the basic principles to govern this sector, listing the following objectives:

## 2.6 AGRICULTURE

1. Protection of consumers' interest, ensuring consumer confidence and avoiding misleading labelling;
2. The development of organic production while taking account of regional differences in climate, farming conditions and the stage of development of organic farming;
3. A high level of protection of the environment, biodiversity and natural resources;
4. Respect of high animal welfare standards that fully meet animals' species-specific needs.

The proposal is also intended to create the necessary conditions to allow the sector to develop in an economically viable manner and in accordance with changes in production and the marketplace, meaning that Member States may apply less stringent regulations in accordance with local variations. Essentially, the possibility exists to transform the current system, with a whole range of exceptions, into a general system clearly establishing production conditions, scope of application, responsibilities of the bodies involved, etc.

Source: Proposal for a Council Regulation on organic production and labelling of organic products. 21.12.2005

### NOTES

- Utilised Agricultural Area (UAA): Sum total of arable land, grassland and permanent pasture. The figures come from the "Crop Area and Yield Survey", various years, Spanish Ministry of Agriculture, Fisheries and Food.
- Since 1989, organic farming in Spain has been governed by the Generic Organic Agriculture Designation Regulations (*Reglamento de la Denominación Genérica Agricultura Ecológica*), and at a European level by EEC Council Regulations 2092/91 and 1804/1999, the latter governing organic livestock farming. Both the Commission's "European Action Plan for Organic Food and Farming" and the MAPA's Strategic Plan for Organic Production (*Plan estratégico para la producción ecológica*) contain new initiatives in this area intended to foster the market for organic foodstuffs and improve quality standards through increased efficiency, transparency and consumer confidence. Spain provides favourable conditions for the development of this productive system, which champions a balance of ecological, financial and social principles. Meanwhile, increases in such production reflect consumer concerns for healthy food and protection of the environment following the impact on public opinion of various food crises.

### SOURCES

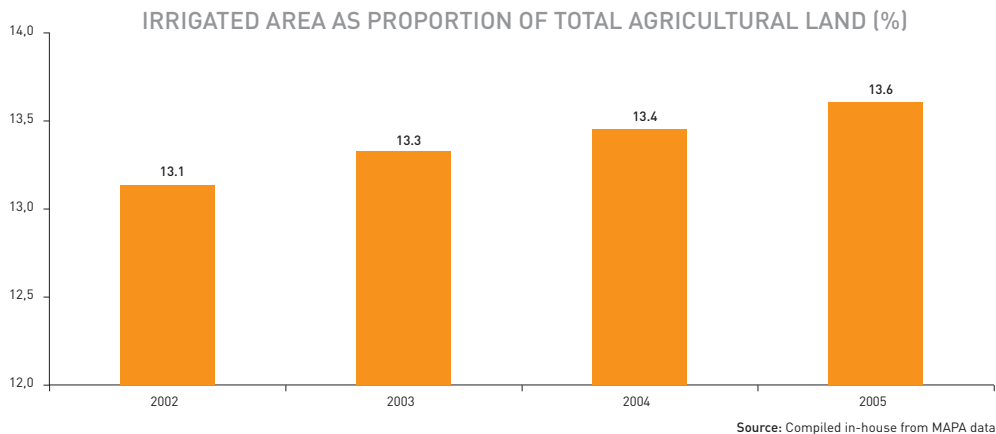
- "Crop Area and Yield Survey", various years, Spanish Ministry of Agriculture, Fisheries and Food.
- Spanish Ministry of Agriculture, Fisheries and Food. Directorate General for the Agri-Food Industry and Foodstuffs (*Dirección General de Industria Agroalimentaria y Alimentación*). Sub-Directorate General for Agri-Food Promotion and Quality (*Subdirección General de Calidad y Promoción Agroalimentaria*). "Agriculture, Fisheries and Food in Spain 2005".
- "Facts and Figures for the Agri-Food Sector and Rural Environment in Spain. Organic Farming". Website of the Spanish Ministry of Agriculture, Fisheries and Food. 2004 data.
- "Agriculture in the European Union. Statistical and Economic Information, 2002". Directorate General for Agriculture. February 2003.
- "Organic Farming in Spain. The Strategic Plan" (*"La agricultura ecológica en España. El Plan Estratégico"*). Spanish Ministry of Agriculture, Fisheries and Food, [s.a].

### FURTHER INFORMATION

- [www.mapa.es](http://www.mapa.es)
- [www.agroinformacion.com](http://www.agroinformacion.com)
- [www.eea.europa.eu](http://www.eea.europa.eu)

## Irrigated area

By 2005, 81% of the consolidation and improvement schemes set out in the National Irrigation Plan - 2008 Horizon (*Plan Nacional de Regadíos - Horizonte 2008*), covering 445,001 ha, had been implemented



This indicator measures irrigated area as a proportion of utilised agricultural area (UAA), monitoring changes and providing a basis for considerations as to the impact of this factor on the management of water resources and other environmental issues.

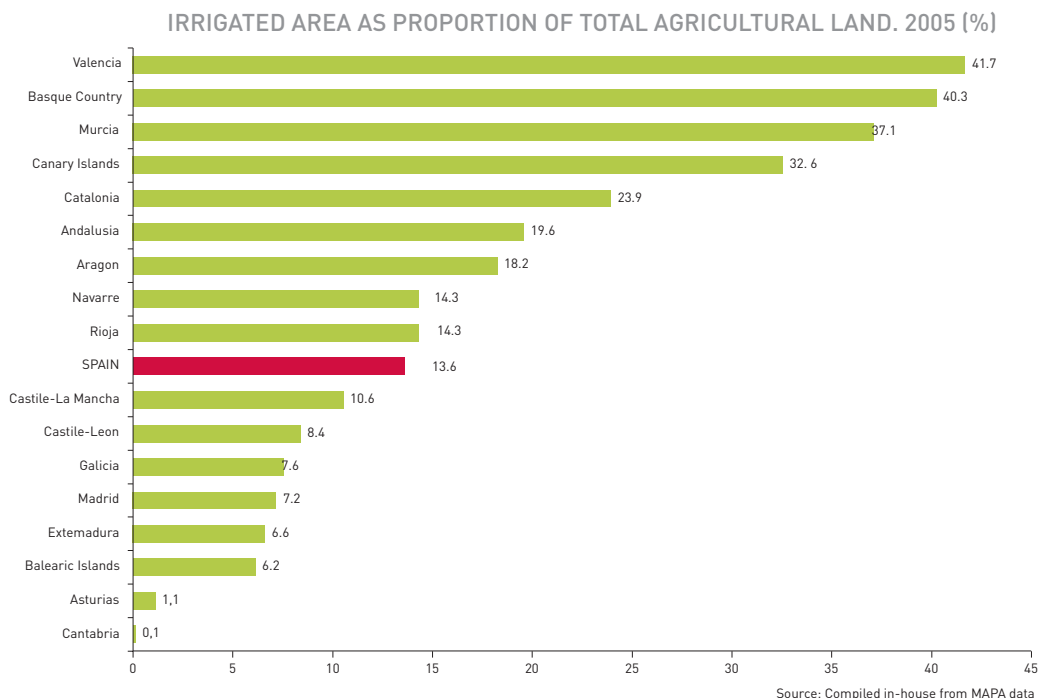
The data provided by this indicator show that land use for agricultural purposes was characterised by a 2% increase in irrigated area over the period 2002-2005, taking it to its present level of 13.6% of UAA.

### DISTRIBUTION OF IRRIGATED AREA BY USE. 2005

	Area (ha)	% of total
Herbaceous crops*	1,809,719	53.3
Ligneous crops	1,380,024	40.6
Family smallholdings	70,660	2.1
Greenhouse crops	61,702	1.9
Irrigated natural grassland	70,980	2.1
<b>Total</b>	<b>3,396,601</b>	<b>100.00</b>

Source: MAPA. \*This area includes 105,741 ha of fallow irrigated land

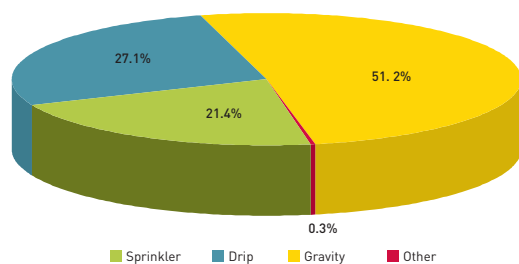




The Autonomous Communities with the highest proportion of irrigated area (above 30% of total agricultural land) are Valencia, the Basque Country, Murcia and the Canary Islands. These are followed by Catalonia, Andalusia, Aragon, Navarre and Rioja, all of which record figures above 13.6%, the overall proportion of irrigated area to total agricultural land in Spain in 2005.

Water is distributed to crops by various techniques, the most commonly employed, in terms both of area and quantity of water, being the gravity-fed system, followed some considerable way behind by sprinkler and drip systems, as may be seen in the graphic below.

**WATER CONSUMPTION BY IRRIGATION TECHNIQUE. 2005**



Source: INE

## URGENT IRRIGATION IMPROVEMENT AND CONSOLIDATION PROJECTS (Royal Decree 287/2006 of 10 March)

Water reserves at the start of 2006 were 20% below the average for the last 10 years, raising the issue, given the quantity of water used for irrigation (75% of the total), of bringing about a reduction in the water resources used by this cultivation system. To tackle the situation, the Spanish Ministries of the Environment (*Ministerio de Medio Ambiente*) and of Agriculture, Fisheries and Food sponsored Royal Decree 287/2006 (RD 287/2006) of 10 March, which set out a series of specific measures.

Water use optimisation in agriculture requires modernisation of the systems employed to transport, distribute and apply water on agricultural plots; selection of less demanding crop varieties; and use of alternative water sources (desalination or wastewater treatment), along with the introduction of modern information technology. Schemes drawn up under the terms of Royal Decree 287/2006 should include environmental actions designed to enable implementation of environmental protection, remediation and compensation measures.

Irrigation communities will be responsible for monitoring local environmental improvements and consolidation, above all in terms of waste discharges and diffuse pollution produced by phytosanitary product use, and are obliged to provide the Environmental Authorities with all information required. Under no circumstances may existing irrigated areas be extended, with the water savings achieved being used to meet environmental needs and supply the human population.

The actions introduced through Royal Decree 287/2006 focus on low-water-efficiency irrigated areas. The urgent improvement plan running up to 2007 covers an area of 868,898 ha and implementation represents water savings of 1,162 hm<sup>3</sup>. The Action Programme includes 137 projects to be undertaken in Andalusia, Aragon, Asturias, Catalonia, Castile-La Mancha, Castile-Leon, Canary Islands, Valencia, Balearic Islands, Extremadura, the Basque Country and Murcia. The budget for these projects is estimated at 2,344.08 M €, of which public funds will account for 1,808 M €.

### NOTES

- Irrigated area refers to the area devoted to crop production or pasture improvement which is supplied with water, irrespective of the number of times irrigation is performed per year. In Spain, irrigation farming has traditionally been used to overcome the restrictions imposed by climate in a large part of the country.
- The figures for Utilised Agricultural Area (UAA) correspond to farmland, including herbaceous crops, ligneous crops, fallow land and other unoccupied areas. These are taken from the "Crop Area and Yield Survey 2005" carried out the Spanish Ministry of Agriculture, Fisheries and Food.
- Irrigation farming provides more than 50% of overall agricultural output, although it makes up only 13.60% of utilised agricultural area, and 7% of Spain's overall geography. In economic terms, it contributes 2% of GDP, and employs 4% of the population. However, it consumes between 70% and 80% of all available water resources, and requires costly infrastructure which needs to be maintained, upgraded and replaced (almost a third of infrastructure is over 100 years old), aspects which have a negative impact on environmental conservation.
- According to the Spanish National Irrigation Plan, Spain's irrigable area stands at some 3.8 million ha, of which (according to provisional MAPA figures) around 3.5 million are irrigated each year (3,396,601 ha in 2005). Irrigation is mainly performed in valleys and makes use of surface water taken from rivers, the exceptions being irrigated areas on the plains of both central plateaus and areas of Andalusia, in which groundwater is used.

## 2.6 AGRICULTURE

### SOURCES

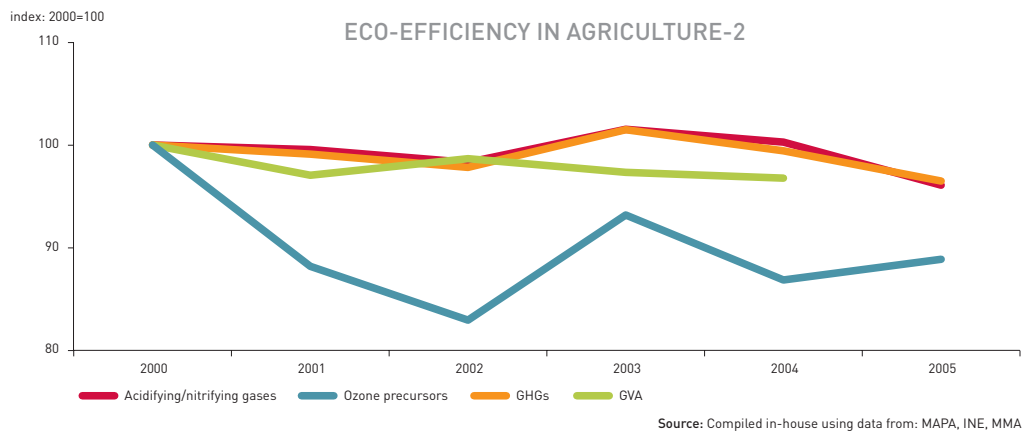
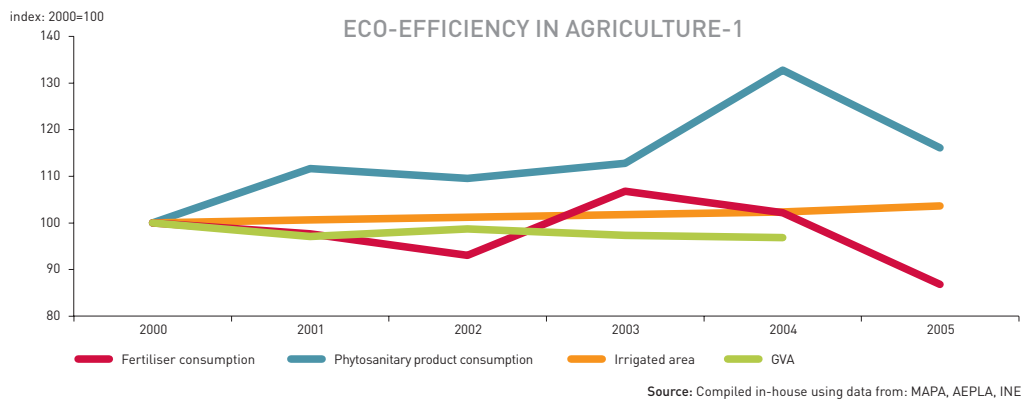
- "Crop Area and Yield Survey, 2005", Spanish Ministry of Agriculture, Fisheries and Food.
- "Agriculture, Fisheries and Food in Spain, 2005". Spanish Ministry of Agriculture, Fisheries and Food.
- Survey on Water Use in the Agricultural Sector (*Encuesta sobre el uso del agua en el sector agrario*). Various years. Spanish National Institute of Statistics (*INE - Instituto Nacional de Estadística*).
- Spanish Ministry of Agriculture, Fisheries and Food. Agri-Food Statistical Yearbook, 2003. [www.mapa.es](http://www.mapa.es)
- Text of the Spanish National Irrigation Plan - 2008 Horizon. Section 4.2: Irrigated farmland: description and classification (*Regadíos en explotación: caracterización y tipificación*). Query conducted on the website <http://www.mapa.es/desarrollo/pags/pnr>
- Spanish National Institute of Statistics. Physical Environment - Environmental Water Statistics; Survey on Water Supply and Treatment (*Entorno Físico y Medio Ambiente, Estadísticas ambientales sobre el agua, Encuesta sobre el suministro y el tratamiento del agua*), press release, 1 July 2004. [www.ine.es](http://www.ine.es)
- Royal Decree 329/2002 (*Real Decreto 329/2002*), of 5 April, by which the "Spanish National Irrigation Plan - Horizon 2008" is approved.

### FURTHER INFORMATION

- [www.ine.es/inebase](http://www.ine.es/inebase)
- [www.mapa.es/desarrollo/pags/pnr](http://www.mapa.es/desarrollo/pags/pnr)

## Eco-efficiency in agriculture

There were particularly significant falls in 2005 in fertiliser and phytosanitary product use and pollutant gas emissions



The relationship between the economic variables, in particular Gross Value Added (GVA) for the sector, and the variables concerning use of water, fertilisers and phytosanitary products, as well as for atmospheric emissions by agriculture, indicate that Spain may be approaching eco-efficiency in agriculture, with positive factors visible which could indicate changes in previously noted trends.

Over the period 2000-2004, GVA (at constant prices) fell by 3.2%, although 2002 broke this downward trend by showing an increase on 2001. This reduction in economic activity in the agricultural sector is consistent with falls in other variables within the sector, such as fertiliser consumption, for example.

## 2.6 AGRICULTURE

Over the period 2000-2005, phytosanitary product consumption increased by 16%, despite the considerable reduction in 2005 compared with 2004, when it fell by 6,023 tonnes, equivalent to 0.42 kg of active ingredient per hectare.

Fertiliser consumption in Spain reached its peak in 2003, at 149.4 kg/ha. However, a fall is evident from this point onwards, with consumption reaching a level of 121.5 kg/ha in 2005, a reduction of 13.2% compared with the figure for 2000.

Irrigated area rose slightly (3.6%) over the period 2000-2005, standing at 3,396,601 ha in 2005. There was also an increase in the proportion of irrigated area to Utilised Agricultural Area (UAA). Meanwhile, in order to optimise water use in agriculture, irrigation improvement and consolidation programmes are underway on almost one million hectares.

As regards pollutant emissions, there was a fall of almost 4% in emissions of acidifying and nitrifying gases over the period 2000-2005. There was also a reduction of 11.1% in ozone precursors over the same period, while Greenhouse Gas emissions decreased by 3.5%.

In summary: over the period 2000-2005, the downward trend in GVA was accompanied by an increase in irrigated area and phytosanitary product consumption (although this fell sharply in 2005), and a reduction in fertiliser consumption per hectare as a result of lower consumption in the last year of the period. With regard to pollutant gas emissions, the trend reveals annual fluctuations with a notable upturn in 2003 and a sharp decline in 2005, indicating a connection between GVA and such emissions.

**NOTES**

- The Gross Value Added (GVA) figure is that presented by the Spanish National Institute of Statistics, by sector, at constant prices.

**SOURCES**

- "Crop Area and Yield Survey", various years, Spanish Ministry of Agriculture, Fisheries and Food.
- "Agriculture, Fisheries and Food in Spain, 2005". Spanish Ministry of Agriculture, Fisheries and Food.
- "Facts and Figures for the Agri-Food Sector and Rural Environment in Spain. Organic Farming". Website of the Spanish Ministry of Agriculture, Fisheries and Food. 2004 data.
- Spanish Plant Protection Association (AEPLA).
- "Agri-Food Statistical Yearbook". Various years. Spanish Ministry of Agriculture, Fisheries and Food.
- Spanish National Institute of Statistics. Spanish regional accounts (*Contabilidad regional de España*). 1995 base (website query).
- Spanish National Atmospheric Emissions Inventory (*Inventario Nacional de Emisiones de Contaminantes a la Atmósfera*). Spanish Ministry of the Environment.

**FURTHER INFORMATION**

- [www.mapa.es](http://www.mapa.es)
- [www.ine.es](http://www.ine.es)