# 2.6 AGRICULTURE

Agriculture, together with the agricultural product processing and marketing industry, continues to represent one of the most important economic and social sectors. It supplies food to society, raw materials to the agri-food industry and constitutes the main economic activity and source of employment in the rural environment, therefore preventing abandonment of these areas.

As well as performing these economic and social functions, agriculture produces many environmental benefits by conserving areas of high natural value that depend on it and forming part of the traditional landscape and contributing to conserving its unique elements. Sustainable agriculture prevents desertification of the rural environment, maintains agricultural and semi-natural habitats that are important for biodiversity and conserves native breeds and traditional varieties, thereby preventing genetic erosion.

The relationship between agriculture and the environment can be analysed on three fronts: contamination (due to nitrates and other nutrients, pesticide residues, salinisation, emissions, deposition of ammonia and methane); destruction of natural resources (inappropriate use of water and land, destruction of semi-natural land cover, destruction of associated biodiversity); and conservation and

improvement of the environment (creation or conservation of landscapes and habitats, conservation of genetic diversity, production of renewable energy sources).

From an economic point of view, the latest Common Agricultural Policy (CAP) reform (Agenda 2000 and review in 2003) has to a large extent broken the link between subsidies for producers and agricultural production. Moreover, the range of agri-

| INDICADOR | META | TENDENCIA |
|---|---|---|
| **Fertiliser consumption** | Reduce fertiliser consumption | Fertiliser consumption in 2006 was similar to 2005 and lower than previous years |
| **Phytosanitary product consumption** | Reduce consumption of phytosanitary products | In 2006, consumption increased again after a significant fall in 2005 |
| **Organic farming** | Increase proportion of organic farmland to total farmland | In 2006, the area devoted to this practice increased by 14% on the previous year |
| **Irrigated area** | Introduce more efficient irrigation systems | Increasing use of more efficient irrigation systems |
| **Eco-efficiency in agriculture** | Increase the economic value of agricultural production, reducing pressure on the environment | Apart from consumption of fertilisers, which increased slightly, phytosanitary product consumption, irrigated area and GVA decreased |

environmental policy instruments available from the EU has increased with the latest rural development policy reform. The CAP, therefore, can no longer be considered a promoter of agricultural intensification. The challenge now is to ensure rural development.

As a result, subsidies will be linked to respect for the environment, safety of food for consumption and animal welfare standards. This approach will contribute to socio-economic development and preservation of the rural landscape.

Support for rural development in Spain is reflected in approval of Act 45/2007 *(Ley 45/2007)*, of 13 December, regarding sustainable development of the rural environment. This aims to achieve better spatial integration of rural areas, enabling a complementary relationship to develop between rural and urban environments and promoting sustainable development in the rural environment. Additionally, it aims to improve the socio-economic situation for rural areas' populations and provide access to public services of sufficient scope and quality.

In accordance with EC regulations, a National Strategic Plan *(Plan Estratégico Nacional)* has been drawn up for the 2007-2013 period. This defines strategic priorities that should be translated into specific measures in each of the Rural Development Programmes *(Programas de Desarrollo Rural)* which will be carried out in each Autonomous Community.

This chapter reviews a set of indicators that reveal the aspects of agriculture that affect the environment in Spain. Fertiliser and phytosanitary product use is one of the most relevant of these. In 2006, fertiliser consumption figures remained at a similar level to previous years, whereas phytosanitary product use, after a fall in consumption in 2005, began to show an increase.

The amount of irrigated farmland remains at a level similar to previous years, whilst a steady increase can be seen in the use of more efficient irrigation systems.

Lastly, the area devoted to organic farming continues to increase, revealing a further indication of producers' environmental awareness and a rise in consumer demand due to society's increased concern for the environment. Also, a Comprehensive Action Plan *(Plan Integral de Actuaciones)* has been drawn up to promote organic farming.

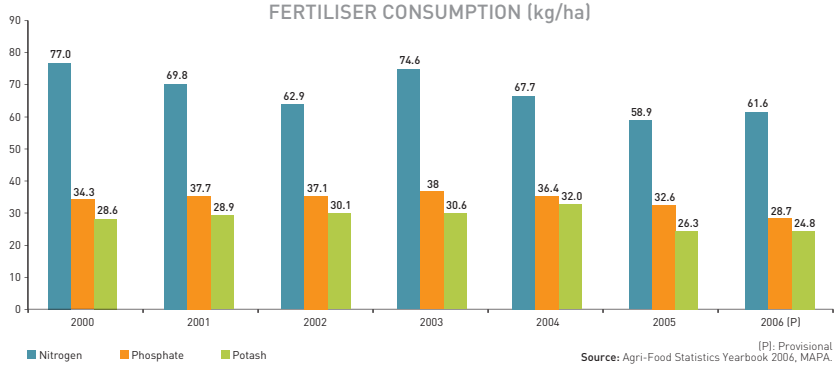




# Fertiliser consumption

## Phosphate and potash fertiliser consumption per hectare fell whilst nitrogen fertiliser consumption increased

FERTILISER CONSUMPTION (kg/ha)




(P): Provisional
**Source:** Agri-Food Statistics Yearbook 2006, MAPA.

Since 2004, the amount of fertiliser used per hectare has fallen from 136.1 kg/ha to 115.1 kg/ha in 2006. This decrease was seen in both phosphate and potash fertilisers. However, according to provisional data, in 2006 the amount of nitrogen fertiliser used per hectare is expected to have increased by 4.6% on the previous year.

The provisional data on the amount of mineral fertiliser consumed during 2006 point to stabilisation in total fertiliser consumption. In absolute figures, consumption during 2006 was similar to 2005 (both remained below 5,000,000 t). By fertiliser type, the increase in consumption of nitrogen fertilisers (a 4.6% rise on 2005) is offset by the fall in phosphate (by 11.9%) and potash (by 5.6%) fertilisers.

FERTILISER COMSUMPTION

| By commercial product (thousand t) | 2004 | 2005 | 2006 |
|---|---|---|---|
| Simple nitrogen products | 2,566 | 2,277 | 2,515 |
| Simple phosphate products | 219 | 210 | 178 |
| Simple potash products | 325 | 221 | 248 |
| Complex products | 2,460 | 2,136 | 1,901 |
| **Total fertilisers** | **5,570** | **4,844** | **4,842** |
| **By fertiliser (thousand t)** | **2004** | **2005** | **2006** |
| Total N | 1,080 | 927 | 970 |
| Total $P_2O_5$ | 589 | 513 | 452 |
| Total $K_2O$ | 518 | 414 | 390 |

**Source:** "Agriculture, Fisheries and Food in Spain 2006". MAPA with ANFFE data

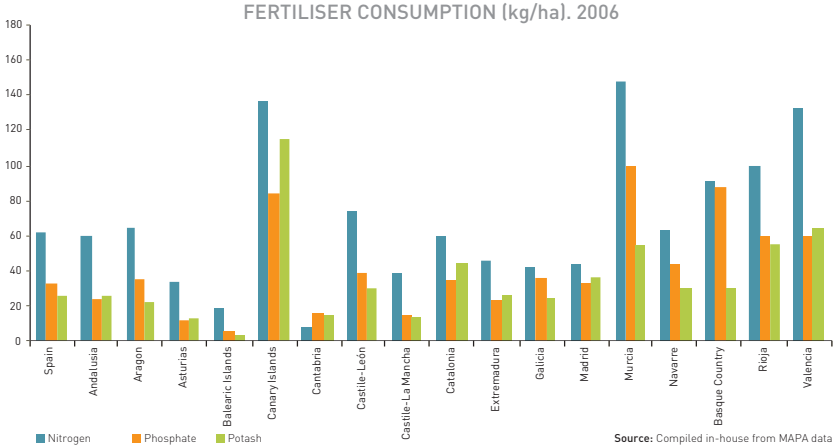
If the type of fertiliser used (as commercial product) is analysed, an increase can be seen in consumption of simple nitrogen fertilisers (10.5%). Consumption of simple phosphate fertilisers fell by 15.1% (178,000 t) on 2005. Simple potash fertilisers showed an increase of around 12.4% due to consumption of potassium chloride (211,000 t), which represents almost 80% of the total of simple potash fertilisers and increased by 19.9%, despite the fall in consumption of potassium sulphate (17.4%).

EC legislation regarding EU-designated fertilisers is set out in Council Regulation (EC) 2003/2003 of the European Parliament and of the Council, of 13 October, regarding fertilisers and is completed on a national level by Royal Decree 824/2005 (Real Decreto 824/2005), of 8 July, regarding fertiliser products. In addition, and as indicated by Act 45/2007 (Ley 45/2007), of 13 December, regarding sustainable development of the rural environment, the Government is expected to approve a National Plan for Agricultural and Livestock Environmental Quality *(Plan Nacional de Calidad Ambiental Agrícola y Ganadera)* which will include sub-programmes regarding reduction and sustainable use of agricultural fertilisers and phytosanitary products.

The break-down by Autonomous Community follows the same pattern as previous years, with higher fertiliser consumption per hectare in regions such as the Canary Islands, Murcia and Valencia, where agriculture is more intensive.

The Nitrates Directive (Directive 91/676/EEC) sets the limit for fertiliser use at 170

FERTILISER CONSUMPTION (kg/ha). 2006




**Source:** Compiled in-house from MAPA data

kg/ha. The European Environment Agency has analysed, amongst other indicators, changes in fertiliser use over the decade 1990-2000, noting a downward trend. With regard to nitrogen fertilisers, the European average in 2000 reached 55 kg/ha, 16% more than in 1990, with Italy (37 kg/ha) and Ireland (226 kg/ha) at the two extremes among the EU-15 countries. Although the trend is towards progressive reduction, Spain increased its use by 47% and Ireland by 22% over the period analysed.

In absolute figures, Eurostat indicates that in the EU-15, consumption of fertiliser products (nitrogen, phosphate and potash) fell from 17,505,516 t in 1997 to 15,610,276 t in 2001, a decrease of 12.14%. According to this same source, in the same period Spain increased consumption by 3.57%.

NOTES

- Fertilisable area is defined as arable land (excluding fallow and other unoccupied land) and natural grasslands, in accordance with the Agri-Food Statistical Yearbook, 2006 *(Anuario de Estadística Agroalimentaria, 2006)*. Spanish Ministry of Agriculture, Fisheries and Food (MAPA – *Ministerio de Agricultura, Pesca y Alimentación*).
- Fertilisers are products used in agriculture or gardening that, due to their nutrient content, encourage plant growth, increase yield and improve harvest quality, or that, due to their specific action, modify, as desired, soil fertility or its physical, chemical or biological characteristics. Fertilisers, special products and conditioners are included in this category.
- Inorganic or mineral fertiliser: fertiliser obtained from extraction or physical or chemical industrial processes whose declared nutrients are present in mineral form.
- Simple fertiliser: nitrogen, phosphate or potash fertiliser with a declared content of a single main nutrient.
- Compound fertiliser: fertiliser obtained chemically or by mixing, or a combination of both, with a declared content of at least two main nutrients.
- Complex fertiliser: compound fertiliser obtained from a chemical reaction, in solution or solid form as granules, and with a declared content of at least two main nutrients. In solid form, each granule contains all the nutrients in its declared composition (definitions included in Royal Decree 824/2005 of 8 July, regarding fertiliser products).

SOURCES

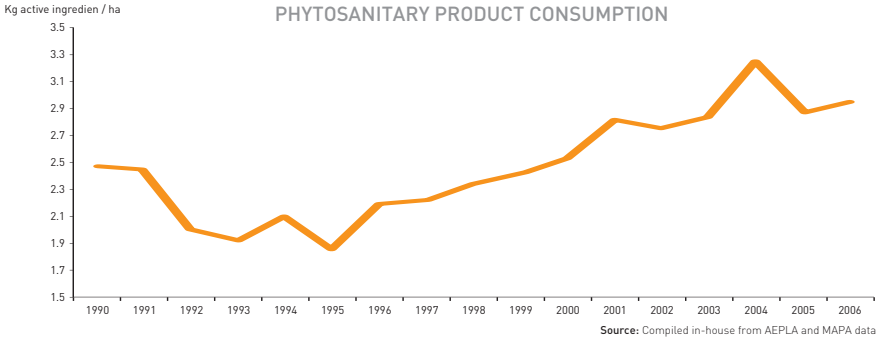
- Spanish Association of Fertiliser Manufacturers (ANFFE – *Asociación Nacional de Fabricantes de Fertilizantes*).
- Agri-Food Statistics Yearbook 2006. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- Crop Area and Yield Survey (ESYRCE – *Encuesta sobre Superficies y Rendimientos de Cultivos*), 2006. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- "Agriculture, Fisheries and Food in Spain, 2006" (*"La agricultura, la pesca y la alimentación en España, 2006"*). Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- European Environment Agency: "Gross nutrient balance", 2005.

FURTHER INFORMATION

- **http://www.mapa.es**
- **http://www.anffe.com**
- **http://epp.eurostat.ec.europa.eu/portal/**
- **http://themes.eea.europa.eu**

# Phytosanitary product consumption

## Phytosanitary product consumption in 2006 showed a notable fall compared with 2004, but remained at a similar level to 2005




**Source:** Compiled in-house from AEPLA and MAPA data

Phytosanitary product consumption is conditioned by climatic factors, particularly rainfall, which determines yields forecast by farmers and therefore conditions application of phytosanitary products.

In 2005, due to adverse weather conditions, a significant fall was registered in phytosanitary product consumption per hectare (active ingredients), since which time consumption has remained almost stable, registering only a slight increase of 1.6% in 2006 compared with 2005.

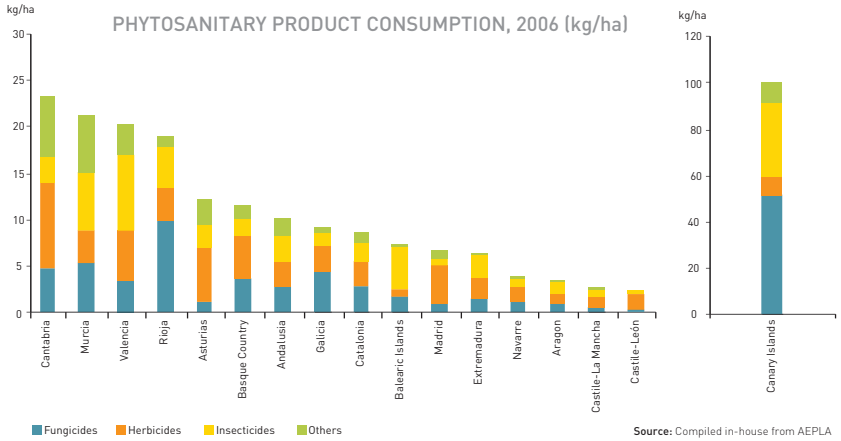
The phytosanitary products most used in 2006 were fungicides and herbicides, both in the same proportion (28% of total phytosanitary products), followed by insecticides (17%).

In July 2006, the Commission presented three proposals for phytosanitary product legislation as part of the Thematic Strategy for the Sustainable Use of Pesticides. First, the proposed regulation on phytosanitary product sale, which substitutes current Directive 91/414 was presented, followed by a proposed Directive on sustainable use of pesticides and, lastly, a proposed regulation on phytosanitary product statistics. These proposals are currently being debated by the Council and Parliament and are expected to be approved in 2008. The objectives of the strategy are as follows: to reduce to a minimum the risks to health and the environment associated with pesticides; to intensify controls on use and distribution of pesticides; to promote conversion to farming that uses pesticides in minimal quantities; and to implement a transparent system to monitor and report on progress achieved.





Statutory reports will also be published showing the annual results of the Phytosanitary Product Sales and Use Monitoring Programmes *(Programas de Vigilancia de la Comercialización y del Uso de Productos Fitosanitarios)* carried out by the Autonomous Regional Governments and which will be widely distributed nationally and internationally.




**Source:** Compiled in-house from AEPLA

The Autonomous Communities that make greatest use of phytosanitary products per hectare are the Canary Islands, with 99.75%, Cantabria (23.49%), Murcia (21.50%), Valencia (20.38%) and Rioja (18.89%).

As regards the risks associated with pesticide use, the European Environment Agency's Core Set of Indicators includes the “Pesticides in Groundwater” indicator, which does not list Spain as a country at high risk of pesticide pollution. The report was drawn up in 2004 with data from 2000.

**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 devoted solely to herbaceous and ligneous crops).

**SOURCES**

- Phytosanitary products: Spanish Plant Protection Association (AEPLA – Asociación Empresarial para la Protección de las Plantas).
- Treated area:
  - Crop Area and Yield Survey (ESYRCE), 2006. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
  - Agri-Food Statistics Yearbook 2006. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- "Agriculture, Fisheries and Food in Spain, 2006". Spanish Ministry of Agriculture, Fisheries and Food (MAPA).

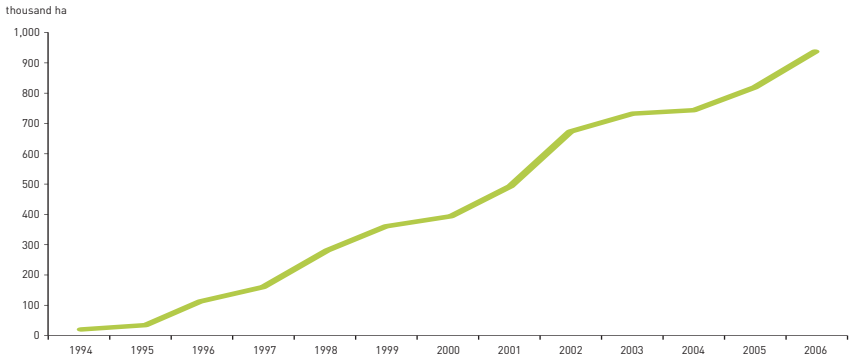
**FURTHER INFORMATION**

- http://www.mapa.es
- http://www.aepla.es
- http://europa.eu
- http://themes.eea.europa.eu

# Organic farming

## In 2006, the largest increase in organic farmland was seen in the area devoted to nurseries and seed cultivation

ORGANIC FARMLAND




**Source:** MAPA

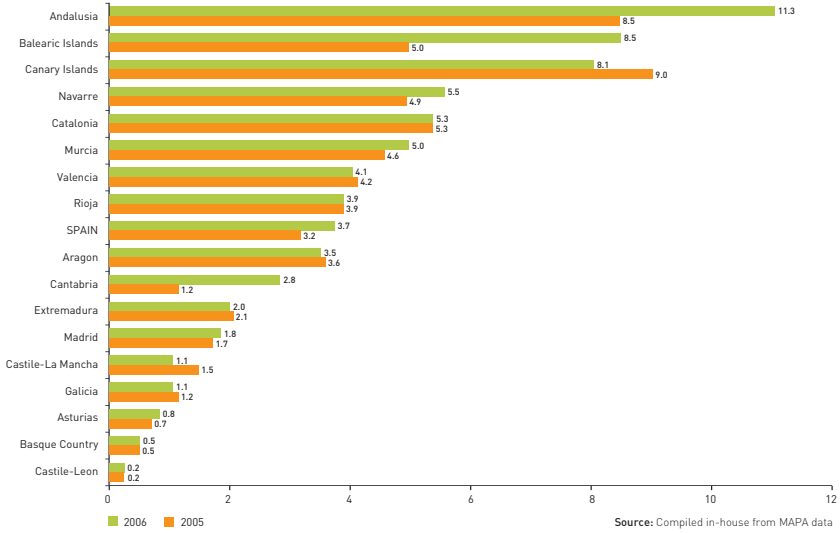
Organic farming is a mode of production that uses a set of agricultural techniques that normally exclude the application of synthetic chemical products, such as fertilisers, pesticides, antibiotics, etc, to agriculture and livestock. The aim of doing so is to preserve the environment, maintain or increase soil fertility and maintain food's natural properties.

In Spain, farmland devoted to organic farming continues to increase, rising in 2006 by 14.7% compared with 2005 to a total of 926,390 hectares. These figures show the strong rate of growth in this agricultural activity since 1991, the year in which Regulation (EEC) 2092/91 entered into force, when 4,235 ha devoted to this type of production were registered.

Similarly, the number of workers has risen from 17,509 in 2005 to 19,211 in 2006, representing an increase of 9.27%. This data is important for assessing organic farming's social return and its role in sustainable rural development.

With regard to the break-down by Autonomous Community, it is worth noting that in Andalusia the percentage of land devoted to organic farming as a proportion of utilised agricultural area increased from 8.5% (403,361 ha) in 2005 to 11.3% (537,269 ha) in 2006, and in the Balearic Islands from 5.0% (15,993.05 ha) to 8.5% (18,841 ha)

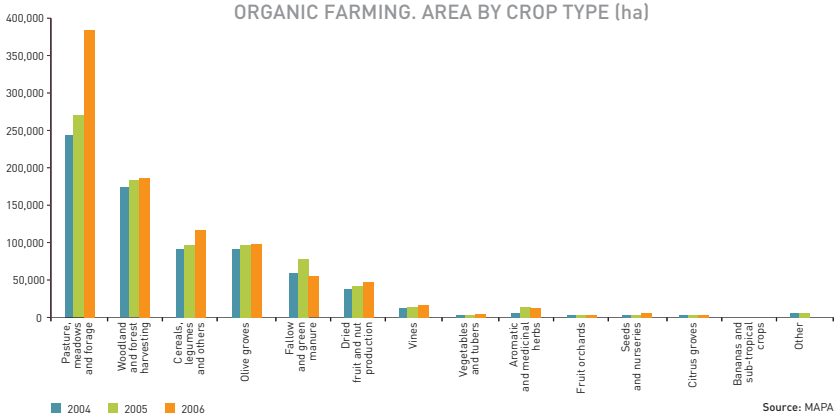
ORGANIC FARMLAND AS PROPORTION OF UTILISED AGRICULTURAL AREA (%)




**Source:** Compiled in-house from MAPA data

in the same period. The Autonomous Communities with the largest amount of organic farmland as a proportion of utilised agricultural area are, after Andalusia and the Balearic Islands, the Canary Islands (8.06% in 2006), Navarre (5.45%), Catalonia (5.32%) and Murcia (5.03%).

ORGANIC FARMING. AREA BY CROP TYPE (ha)




**Source:** MAPA

With regard to break-down by crop type, the main type of land cover, as in previous years, continues to be pastures, meadows and forage, reaching 378,820 hectares in 2006, an increase of 41% compared with 2005. The next largest types of land cover are forests and forest harvesting (189,451 ha), cereals and legumes (113,304 ha) and olives (93,431 ha). One of the main increases has been registered in the area devoted to nurseries and seed cultivation, which rose from 2,858 ha in 2005 to 7,419 ha in 2006, representing an increase of 162%.

In the EU, organic farming has witnessed significant development boosted by growing consumer awareness about food safety and environmental issues. In 2000, this sector only represented 3% of the EU's total utilised agricultural area, but it has grown strongly. As a result, between 1993 and 1998, it grew annually by around 25% and, since 1998, growth has stood at around 30% per year.

An EU report (2003) established the area devoted to organic farming (certified and under conversion) at 5.7 million hectares, 3.6% of utilised agricultural area. In absolute figures, Italy takes first place with one million hectares, followed by Germany, Spain, the United Kingdom and France.

In 2005, the percentage of land devoted to organic farming as a proportion of UAA stood at 4.3% (Eurostat) in the EU-15. That year, Spain was below the European average with 3.2%, close to the UK (3.8%) and above France (2%), but far behind Austria (11%) and Italy (8.4%) which occupy the top positions. It is worth noting that with regard to 2003, not every country has continued to increase the area devoted to organic farming and in several cases, such as Denmark, it has decreased.

The aforementioned research establishes the number of workers employed in organic farming at 149,000, 1.4% of the total for agriculture in the EU-25.



NOTES

- Utilised Agricultural Area (UAA): Sum total of arable land, grassland and permanent pasture. The figures are taken from the "Crop Area and Yield Survey (ESYRCE)". Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- The legal framework governing organic farming in Spain since 1989 is made up of the Generic Organic Agriculture Designation Regulations *(Reglamento de la Denominación Genérica Agricultura Ecológica)* and, at a European level, by Regulation (EEC) 834/2007 of 28 June 2007, regarding production and labelling of organic products and that repealed Regulation (EEC) 2092/91 (Official Journal of the EU of 20.7.2007)

SOURCES

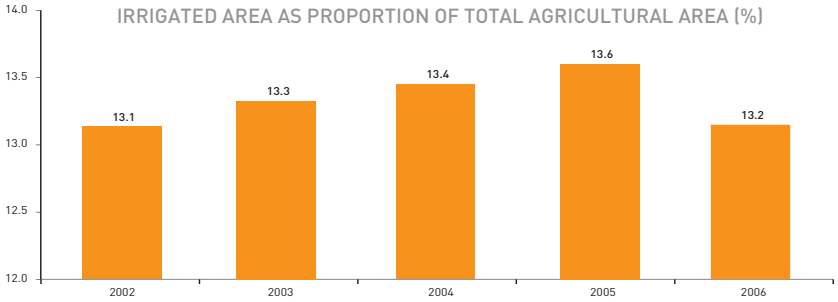
- Crop Area and Yield Survey (ESYRCE), 2005 and 2006, Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- European Commission. Directorate-General for Agriculture and Rural Development, 2005: "Organic Farming in the European Union, facts and figures. Report".
- European Environment Agency: "Area under organic farming", 2005.
- Eurostat: Sustainable consumption and production. Area under organic farming (%) 2000-2005.

FURTHER INFORMATION

- **http://www.mapa.es**
- **http://ec.europa.eu/agriculture/qual/organic/index_es.htm**

# Irrigated area

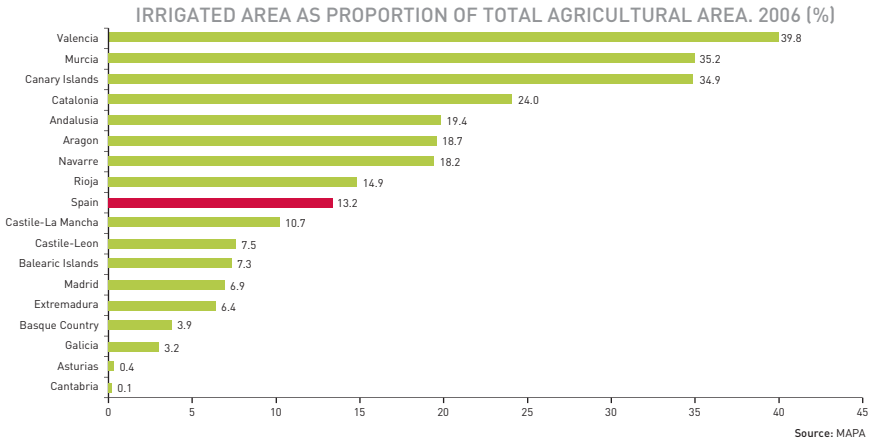
## Irrigation is Spain's main water consumer, accounting for 68% of total consumption




Source: MAPA

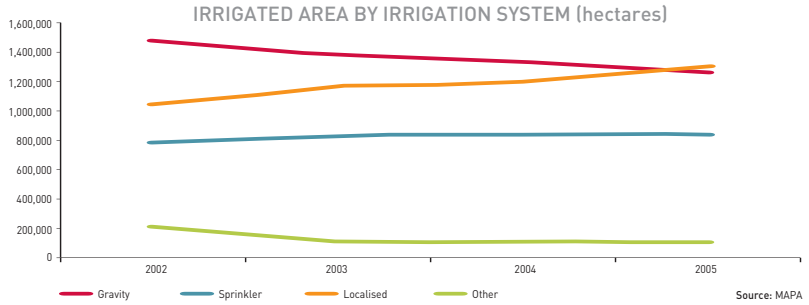
Irrigated area as a proportion of total agricultural area fell in 2006 compared with 2005, although it remains at around 13%.

The Spanish National Irrigation Plan – Horizon 2008 *(Plan Nacional de Regadíos Horizonte 2008)* establishes a series of measures, which include the Environmental Monitoring Programme *(Programa de Vigilancia Ambiental)*, to ensure irrigation management is respectful of the environment. Its aim is to ensure compliance with the measures proposed in the environmental impact statements and that use of irrigation is respectful of the environment in its various aspects.




Source: MAPA

By Autonomous Community, Valencia, Murcia, the Canary Islands and Catalonia have the highest proportion of irrigated area (each over 30%) to total agricultural area.




Source: MAPA

With regard to irrigation systems, there has been a fall in area irrigated by gravity systems in favour of other more efficient methods, particularly localised (drip) irrigation. Between 2002 and 2005, the area served by gravity irrigation systems decreased by 14.7%, whilst sprinkler and localised irrigation increased during the same period by 5.5% and 24.7%, respectively.

Currently, 37.2% of irrigated area is served by localised systems, 35.9% by gravity systems and 23.8% by sprinkler systems. Therefore, despite the downward trend in use of less efficient techniques, these are still employed in a high percentage of Spain's irrigated area.

**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.
- Total agricultural area is the area corresponding to arable land, fallow land, green-houses and family smallholdings.
- Irrigation farming accounts for more than 50% of overall agricultural output, although it makes up only 13.60% of total agricultural area, and 7% of Spain's overall geography.

**SOURCES**

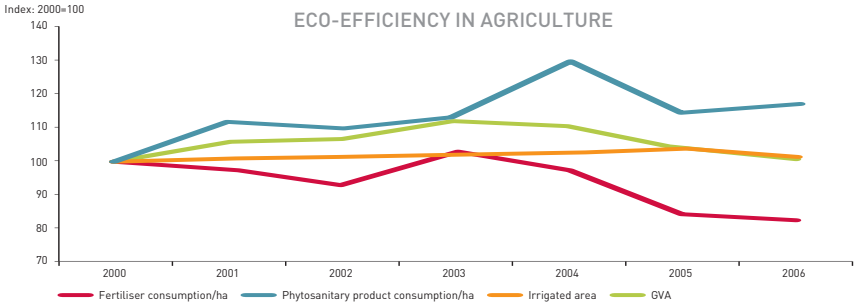
- Crop Area and Yield Survey (ESYRCE), various years. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- http://www.mapa.es/es/desarrollo/pags/observatorio/observatorio.htm#

**FURTHER INFORMATION**

- http://www.mapa.es

# Eco-efficiency in agriculture

## Phytosanitary product consumption has increased more than the sector's economic return




**Source:** Compiled in-house from MAPA, AEPLA and INE data

During the period 2000-2006, agriculture's GVA (Gross Value Added) peaked in 2003 before falling back in 2006 to values similar to those seen in 2000.

This was accompanied by changes in the other selected variables. Among these, fertiliser consumption per hectare fell the most, decreasing by 17% over the 2000-2006 period.

Meanwhile, phytosanitary product consumption per hectare increased the most, rising by 16% during the analysed period, although after peaking in 2004 it fell in 2005 before later rising slightly in 2006.

Irrigated area increased slightly until 2005 before falling in 2006 to values seen in 2002. Nevertheless, overall it has remained more or less stable.

**SOURCES**

- GVA: Spanish National Institute of Statistics (INE – *Instituto Nacional de Estadística*). Spanish National Accounts (Contabilidad Nacional de España). Base 2000. Accounting series 1995-2006. GDP at market prices and breakdown by GVA (Agriculture), at current prices.
- Fertiliser consumption: Agri-Food Statistics Yearbook 2006. Spanish Ministry of Agriculture, Fisheries and Food (MAPA). Year 2006 data is provisional.
- Phytosanitary product consumption:
  - Spanish Plant Protection Association (AEPLA).
  - Agri-Food Statistics Yearbook 2006. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
  - Crop Area and Yield Survey (ESYRCE), various years. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).
- Irrigated area: Crop Area and Yield Survey (ESYRCE), various years. Spanish Ministry of Agriculture, Fisheries and Food (MAPA).

**FURTHER INFORMATION**

- **http://www.mapa.es**
- **http://www.anffe.com**
- **http://www.aepla.es**
- **http://www.ine.es**