

2.6

AGRICULTURE



Agricultural activity is of major importance in the production system. Thus, as well as being one of the main economic sectors, it plays a key role as a land-planning element which also fixes the population, maintains and promotes employment in the countryside and is a basic component in the production system as a whole as a supplier of raw materials for the agrifood industry.

Agricultural activity in Spain is one of the sectors with the greatest impact on the environment. Due to the large amount of land dedicated to agriculture in Spain, which accounts for almost half the country's area, agriculture has become a diverse and strategic sector that is also an essential element for maintaining rural life.

The rural environment, and therefore agriculture, has undergone profound sociological, cultural, technological, economic and institutional changes, and has progressed by taking on board a commitment to quality and safety with the aim of achieving a sustainable, responsible and competitive agricultural sector.

Over the past 20 years, Spanish agriculture, due to its integration into the Common Agricultural Policy (CAP) and its continual and ever more frequent reforms, has come through this adaptation process with reasonably satisfactory results, although with widely differing sector-based and territorial impacts.



INDICATOR	GOAL	TREND
Fertiliser consumption	Reduce fertiliser consumption	Increased fertiliser consumption with respect to 2006 to levels similar to those in 2004
Plant-protection product consumption	Reduce plant-protection product consumption	Plant-protection product consumption decreased slightly in 2007 with respect to 2006 to levels similar to those in 2005
Organic farming	Increase proportion of organic farmland with respect to total farmland	The area dedicated to organic farming increased by 6.9% in 2007 to 988,320 hectares
Irrigated area	Promote the use of more efficient irrigation systems	42.7% of irrigated farmland now uses localised irrigation systems and 21.3% uses sprinkler systems
Eco-efficiency in agriculture	Increase the economic value of agricultural production, reducing pressure on the environment	Consumption of fertilisers, irrigated area and GAV all increased, whereas plant-protection product consumption decreased slightly

The most recent CAP reform (Agenda 2000 and the 2003 reform) decoupled agricultural production subsidies and farm intensification in favour of a multifunctional agriculture linked to rural development.

Climate change, the demand for bioenergy, a lack of water and the economic crisis have arisen as new challenges to the agricultural sector and the rural environment in this new scenario.

In November 2007 the EC set out its thinking for the “CAP medical check-up”, which aims to respond to these new challenges and reinforce Rural Development policy. The most relevant factors highlighted therein are environmental sustainability, market globalisation and food safety, as agriculture must compete effectively on open markets, providing quality food obtained through safe and reliable production methods. On the other hand, agriculture has to manage the natural resources used in production processes, especially land and water, in a sustainable manner. Furthermore, it should supply common benefits that are not directly compensated by the market, such as balanced land occupation, conservation of the countryside and the maintenance of natural spaces and biodiversity.

One of the special circumstances which arose in 2008 was the creation of the Ministry of the Environment and Rural and Marine Affairs from its predecessors the Ministry of the Environment and the Ministry of Agriculture, Fisheries and Food. The priorities of this new ministry include continuing the actions resulting from the National Strategic Plan for Rural Development 2007-2013, which contains the basic guidelines for Spanish rural development policy. These guidelines are based around the following three thematic axes: increasing the competitiveness of the agricultural and forestry sector; diversifying economic activity; and improving the environment and countryside and quality of life.

This chapter analyses the environmental impact of the agricultural sector by updating selected indicators, including those which analyse this sector’s characteristics and progress. The use of fertilisers and plant-protection products to increase production yields and control pests and disease is a key indicator due to their pollution risk, or rather the risk resulting from their incorrect application. The use of plant-protection products decreased slightly in 2007 to a level similar to that seen in 2005, whereas fertiliser use, after the decreases seen in 2005 and 2006, increased slightly.

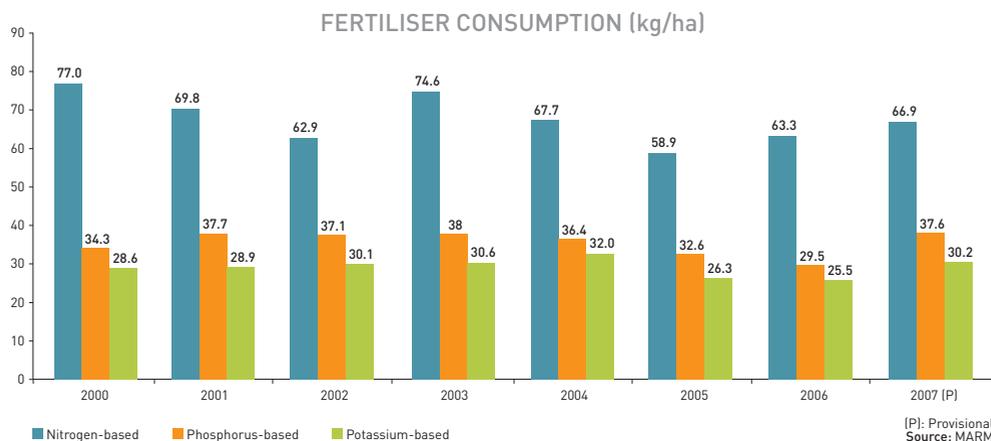
The area dedicated to irrigation farming, which consumes 80% of available water resources, plays a key role in agricultural economy, therefore irrigation is at the centre of water-use and environmental policy. The area dedicated to irrigation farming increased slightly in 2007 to 13.5% of the total, although the use of localised

irrigation, which is much more efficient than traditional gravity systems, increased significantly; use of the latter decreased yet again.

As for the area dedicated to organic farming, Spain has not been oblivious to the positive evolution of this sector in Europe, and this year the area and number of operators increased once more. The main asset of organic farming is its sustainability due to the incorporation of environmental targets into agricultural production. To this end the Comprehensive Action Plan to Promote Organic Farming 2007-2010, which defines a comprehensive strategy for political action in the field of organic farming, has been designed.

Fertiliser consumption

Fertiliser consumption increased in 2007 to levels similar to those in 2004



The amount of fertiliser applied per hectare in 2007 increased to 134.7 kg/ha from the 118.3 kg recorded in 2006; this level is similar to that seen in 2004 (136.7 kg/ha). This increase was found for all three main fertiliser types, although it was particularly notable for phosphorus- and potassium-based fertilisers, which increased by 27.5% and 18.4%, respectively; nitrogen-based fertilisers increased by only 5.7%.

The provisional data regarding the amount of mineral fertiliser consumed during 2007 point to an upturn in total consumption. In absolute figures, consumption during 2007 increased with respect to 2006 to more than 5 million tonnes, thereby interrupting the trend towards stabilisation of the previous two years. When this consumption is expressed in terms of fertiliser components, it can be seen that consumption of all three types increased with respect to the previous year, with nitrogen-based fertilisers increasing by 1.6%, phosphorus-based fertilisers increasing by 22.4% and potassium-based fertilisers increasing by 14.1%.

If the type of fertiliser used (as a commercial product) is analysed, a slight decrease in the consumption of simple nitrogen-based fertilisers (4.7%) can be seen. In contrast, the consumption of simple phosphorus-based fertilisers increased by 39.9% with respect to 2006 to 249,000 tonnes, and the consumption of simple potassium-based fertilisers increased by around 6.1% to 263,000 tonnes.

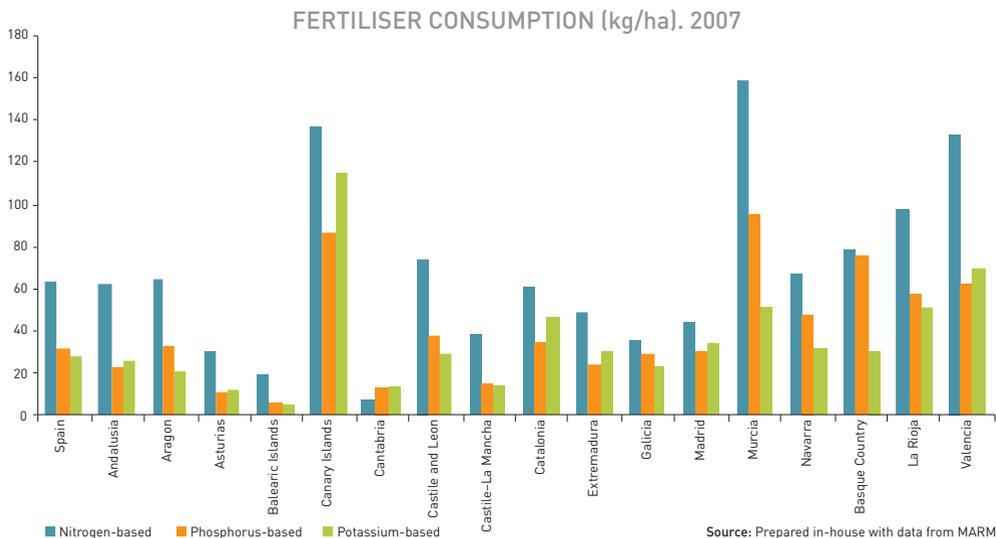
The distribution of fertiliser consumption by Autonomous Region is strongly linked to

FERTILISER CONSUMPTION

Commercial product (thousand tonnes)	2004	2005	2006	2007
Simple nitrogen-based	2.566	2.277	2.515	2.397
Simple phosphorus-based	219	210	178	249
Simple potassium-based	325	221	248	263
Complex	2.460	2.136	1.901	2.285
Total fertilisers	5.570	4.844	4.842	5.194
Fertilising elements (thousand tonnes)	2004	2005	2006	2007
Total N	1.080	927	970	986
Total P ₂ O ₅	589	513	452	554
Total K ₂ O	518	414	390	445

Source: MARM with data from ANFFE

the intensity of their agricultural sectors and follows a similar pattern to previous years, with higher consumption per hectare in the Canary Islands, Murcia and Valencia.



National legislation regarding fertilisers is contained in Royal Decree 824/2005, of 8 July, on fertilisers, which has been partially modified by RD 1769/2007, of 28 December. The future approval and application of the National Plan for Agricultural and Livestock Environmental Quality will complete the national legislation concerning fertilisers by developing a Plan whose overriding objective will be to promote the development of eco-efficient agriculture by taking an environmentally friendly approach to intensive agricultural production. This Plan will also include sub-programmes aimed at the sustainable use of plant-protection products and agricultural fertilisers and will promote the use of renewable energies and biofuels.

NOTES

Fertilisable area is defined as arable land (excluding fallow and other unoccupied land) and natural grasslands, in accordance with the Agrifood Statistical Yearbook, 2007. MARM.

Royal Decree 824/2005 of 8 July and RD 1767/2007 of 28 December, on fertilisers, include the following definitions:

- Fertilisers are products used in agriculture or gardening which, due to their nutrient content, encourage plant growth, increase yield and improve harvest quality, or which, due to their specific action, modify soil fertility or its physical, chemical or biological characteristics as desired. Fertilisers, special products and conditioners are included in this category.
- Inorganic or mineral fertiliser: fertiliser obtained by extraction or physical or chemical industrial processes whose declared nutrients are present in mineral form.
- Simple fertiliser: nitrogen-, phosphorus- or potassium-based fertiliser with a declared content of a single main nutrient.
- Compound fertiliser: fertiliser obtained chemically or by mixing, or a combination of the two, 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 its solid state, each granule contains all the nutrients in its declared content.

SOURCES

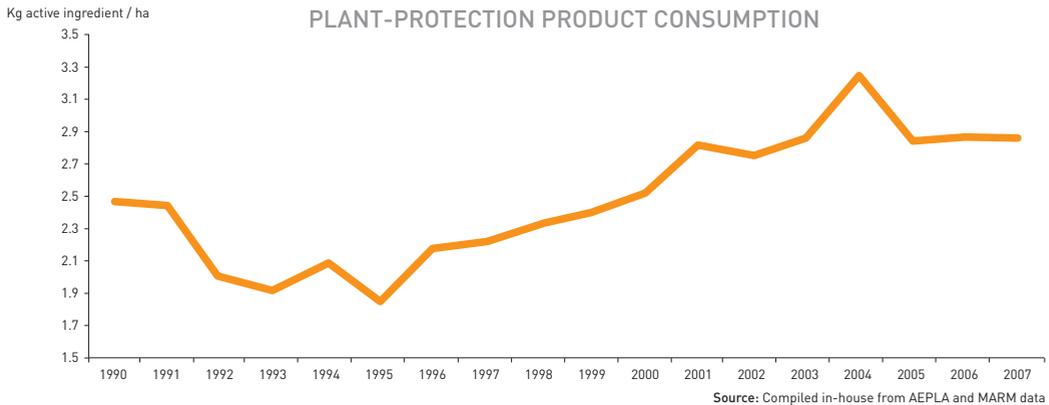
- Spanish Association of Fertiliser Manufacturers (ANFFE).
- Agrifood Statistical Yearbook, 2007. MARM.
- Crop Area and Yield Survey (ESYRCE), 2007. MARM.
- "Agriculture, Fisheries and Food in Spain, 2007". MARM.

MORE INFORMATION

- <http://www.marm.es>
- <http://www.anffe.com>
- <http://epp.eurostat.ec.europa.eu/portal/>
- <http://themes.eea.europa.eu>

Plant-protection product consumption

Plant-protection product consumption decreased slightly in 2007 with respect to 2006 to a similar level to that seen in 2005



The interannual variation in the consumption of plant-protection products is clearly influenced by climatic factors, especially rainfall, which determine the expected harvest and therefore the consumption of these products.

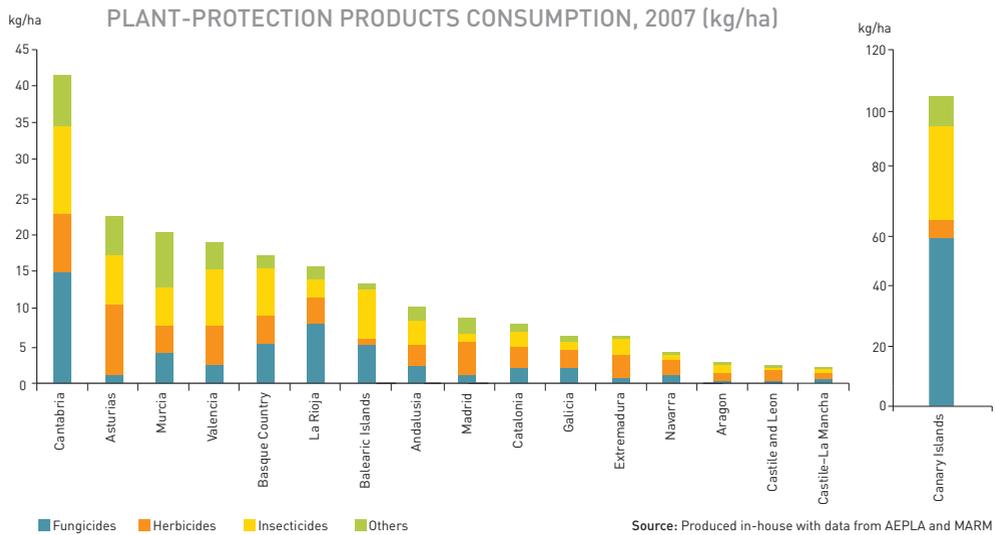
The consumption of plant-protection products (active ingredients) per hectare decreased slightly (0.8%) in 2007 with respect to the previous year to a level last seen in 2005 and preceding years.

As for the types of plant-protection product used most in 2007, herbicide consumption increased by 3% with respect to the previous year to 31%, whereas fungicide consumption decreased slightly (by 3%) to 25% and insecticide consumption remained at the same level as the previous year (17%). The spectacular increase in the consumption of molluscicides and rodenticides (34.3%) due to the plague of voles (*Microtus arvalis*), which began in 2006 and escalated in the summer of 2007, especially in regions of Castile and León, should be noted.

In January 2009 the European Parliament approved a regulation concerning the placing of plant-protection products on the market, which replaces Directive 91/414, and a Directive on the sustainable use of pesticides. The former establishes the publication of a list of active substances which can be used for the formulation of plant-protection products and the elimination of those active substances which are either toxic or harmful to health. The Directive for the sustainable use of pesticides

establishes that member states should adopt national action plans “to set up targets, measures and timetables” to reduce “the risks of pesticide use”.

Likewise, the reports required by the programme for monitoring the placing of plant-protection products on the market are drawn up by the Autonomous Regions.



The Autonomous Regions which use the most plant-protection products per hectare are the Canary Islands, with 102.98 kg/ha, followed by Cantabria (41.41 kg), Asturias (22.74 kg), Murcia (20.31 kg), Valencia (19.20 kg) and the Basque Country (17.34 kg).

NOTES

When calculating the indicator, “area treated with plant-protection 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

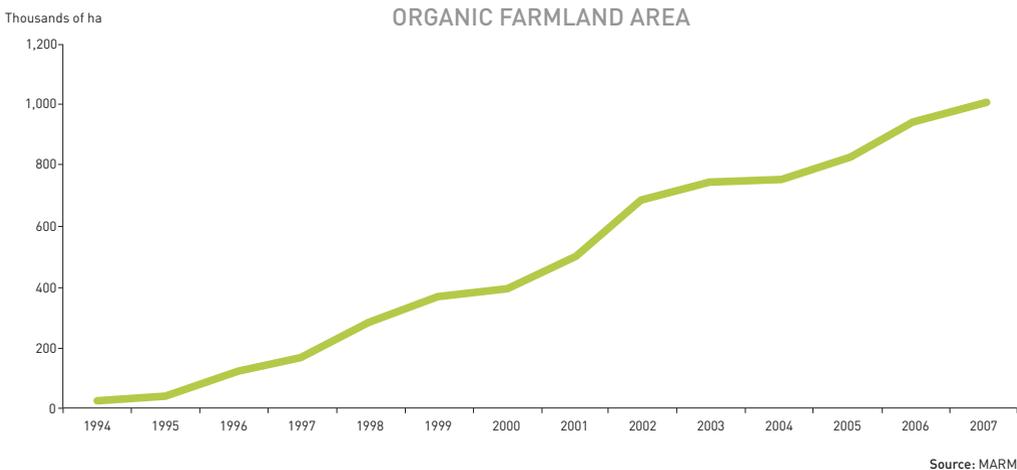
- Plant-protection products: Spanish Plant Protection Association (AEPLA).
- Treated areas:
 - Crop Area and Yield Survey (ESYRCE), 2007. MARM.
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MORE INFORMATION

- <http://www.marm.es>
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- <http://europa.eu>
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Organic farming

The area dedicated to organic farming continued to increase in 2007, especially that dedicated to vegetables and tubers



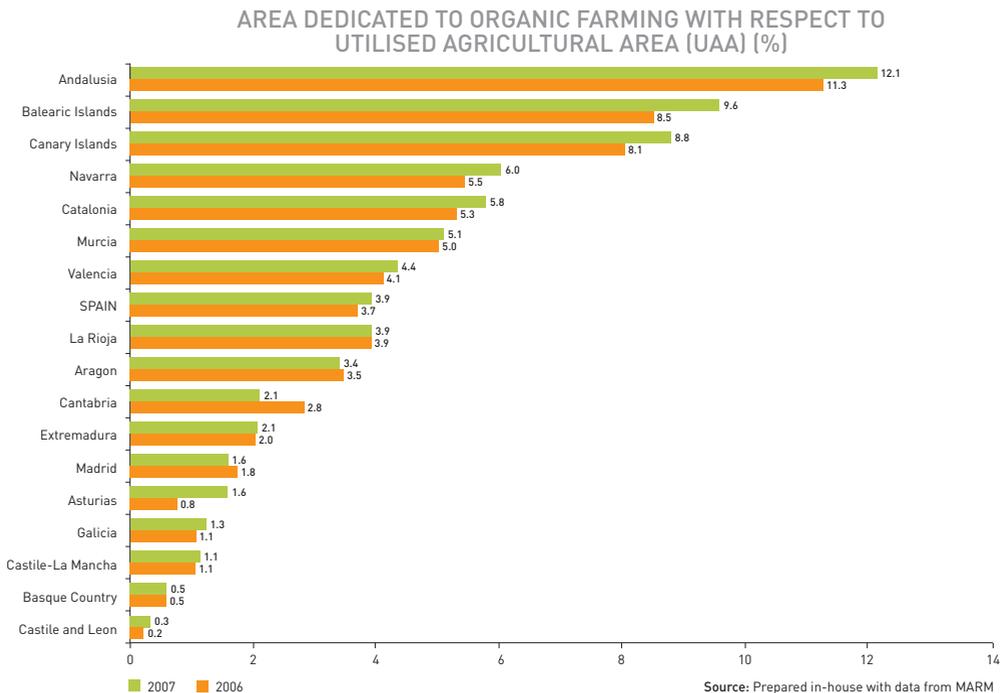
Organic farming is an agricultural system whose chief goal is to obtain foods of the highest quality, whilst respecting the environment and conserving soil fertility, by the optimal use of natural resources, excluding the use of chemically synthesised products and achieving sustainable agricultural development.

Spain has experienced a continual increase in the area dedicated to organic farming as an alternative to more traditional methods. Growth in 2007 was 6.9% with respect to 2006 to give a total of 988,320 hectares. Despite this increase being smaller than that seen in the previous year (14.7%), the general trend since 1991, when Regulation 2092/91/EEC came into force, has been positive.

Although the number of organic farms increased by 4.94% this year from 19,221 to 20,171, this increase was lower than that seen in 2006 (9.27%). This figure is particularly significant for sustainable rural development as it is a means of quantifying the social benefits provided by organic farming.

The breakdown by Autonomous Region shows that only Aragon and Cantabria experienced a decrease in the area dedicated to organic farming with respect to utilised agricultural area. However, whereas the decrease in Aragon was minimal, the proportion of farmland dedicated to organic farming in Cantabria with respect to UAA

decreased rather more substantially, from 2.8% (6967 ha) in 2006 to 2.1% (5148 ha) in 2007. The Autonomous Regions with the largest amount of organic farmland as a proportion of UAA are Andalusia (12.1%, 582,745 ha) and the Balearic Islands (9.6%, 19,285 ha), followed by Navarra (6.0%), Catalonia (5.8%), Murcia (5.1%) and Valencia (4.4%).



The breakdown by crop type is similar to that in previous years. Thus the main use, which is still pasture, grassland and forage, with an area of 429,134 ha in 2007, increased by 13.3% with respect to 2006, and, as in 2006, this is followed by forests and forest harvesting (183,438 ha), cereals and legumes (120,593 ha) and olive groves (94,250 ha).

The area dedicated to seed production and the nursery sector decreased by 16.6% with respect to the previous year. One of the main increases occurred in the area devoted to vegetable and tuber cultivation, which increased from 5039 ha in 2006 to 7044 ha in 2007, an increase of 39.8%.

The organic farming sector in the EU grew very rapidly in the late 1990s, with annual average increases in the area dedicated to organic farming of around 20%. The approval of Regulation 2092/91/EEC on organic production of agricultural products

allowed the harmonisation of organic production methods and meant that this growth slowed somewhat, in line with demand.

In terms of area with respect to UAA, Eurostat data show that organic farming is important in countries such as Austria, where it makes up 10% of the total. Likewise, organic production accounts for between 5% and 10% in countries such as Finland, Italy, Sweden, Greece, Denmark and the Czech Republic, whereas in Spain and France it accounts for 3.2% and 2%, respectively.

NOTES

- Utilised Agricultural Area (UAA): Sum total of arable land, grassland and permanent pasture. Figures are taken from the "Crop Area and Yield Survey (ESYRCE)". MARM.
- Since 1989, the legal framework governing organic farming in Spain is made up of the Generic Organic Agriculture Designation Regulations and, at a European level, by Regulation 834/2007/EC of 28 June 2007, regarding production and labelling of organic products, which repealed Regulation 2092/91/EEC [Official Journal of the EU of 20.07.2007]

SOURCES

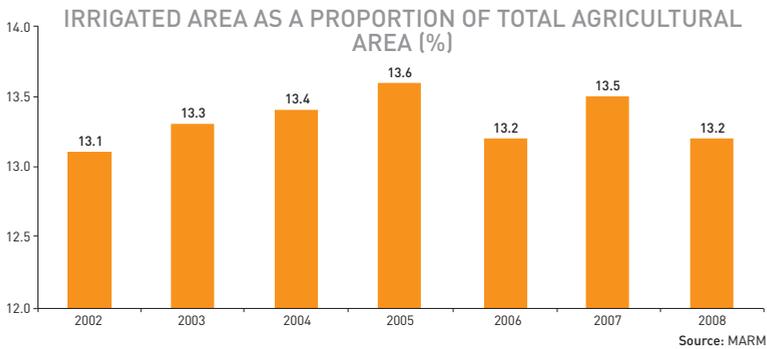
- Crop Area and Yield Survey (ESYRCE), 2006 and 2007. MARM.
- Comprehensive Action Plan for the promotion of organic farming 2007-2010. MARM
- Eurostat: Sustainable consumption and production. Area under organic farming (%) 2000-2005.

MORE INFORMATION

- <http://www.marm.es>
- http://ec.europa.eu/agriculture/organic/eu-policy/data-statistics_es
- http://www.mapa.es/alimentacion/pags/ecologica/pdf/plan_integral.pdf.

Irrigated area

Localised irrigation grew by 29.3% between 2004 and 2008



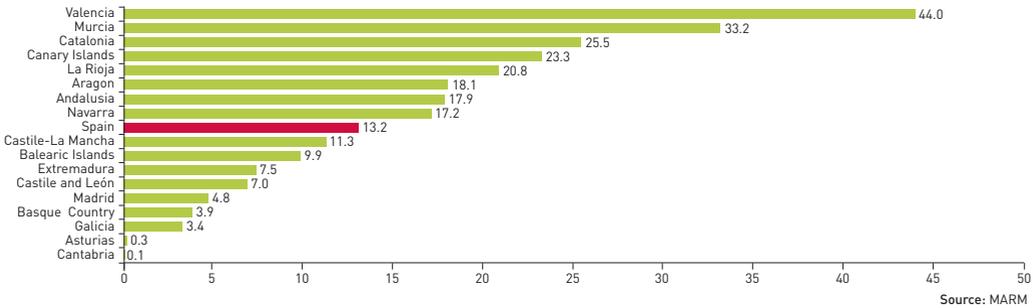
The proportion of irrigated agricultural area with respect to total agricultural area was 13.2% in 2008, a decrease of 0.3% with respect to 2007. Furthermore, this figure is essentially identical to the proportion of mean irrigated area with respect to UAA of 13.25% over the past five years.

Irrigation has played a vital role in Spanish agriculture as it is seen as a traditional response to the climatic limitations inherent to the majority of the country. The Horizon 2008 National Irrigation Plan is managed in a multifunctional manner characterised by the need to fix population, order land use and preserve the countryside, and is a fundamental part of the new European sustainable agricultural model defined in Agenda 2000.

The breakdown by Autonomous Region shows that Valencia (44%), the Canary Islands (25.3%) and Murcia (33.2%) have the highest proportion of irrigated land with respect to total agricultural area, whereas Cantabria (0.1%) and Asturias (0.3%) have the lowest proportion.

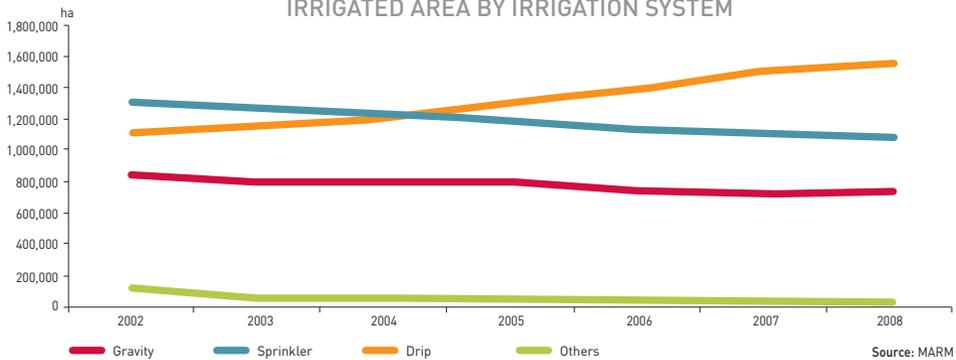
As regards the water-distribution techniques, the downward trend in the area irrigated by gravity systems, which consume much more water, lose more to evaporation and are therefore much less efficient, has continued, whereas the use of more efficient systems such as localised (drip) irrigation has increased substantially. The slight decrease in the area irrigated by sprinklers in the past few years should be highlighted.

IRRIGATED AREA AS PROPORTION OF TOTAL AGRICULTURAL AREA 2008 (%)



The area irrigated using drip irrigation increased by 39.9% between 2002 and 2008, whereas the area irrigated using sprinkler and gravity techniques decreased by 13.6% and 17.3%, respectively. Currently, 45.9% of irrigated area is served by drip systems, 32.1% by gravity systems and 21.5% by sprinkler systems.

IRRIGATED AREA BY IRRIGATION SYSTEM



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.
- Utilised agricultural area is the sum total of arable land, grassland and permanent pasture. Arable land includes herbaceous and ligneous crops, fallow land and family smallholdings.

SOURCES

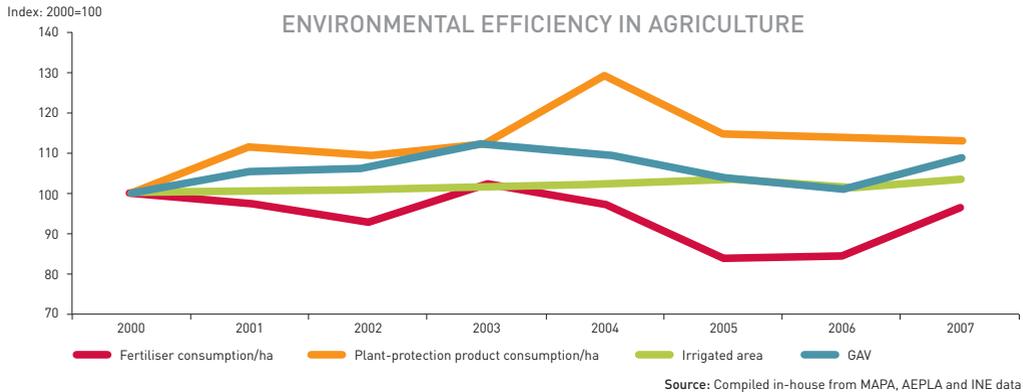
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- National Irrigation Plan – Horizon 2008. MARM.

MORE INFORMATION

- <http://www.marm.es/es/desarrollo/pags/pnr/introduccion.htm>

Environmental efficiency in agriculture

Economic growth in this sector in 2007 was accompanied by a small increase in irrigated area and fertiliser use



The environmental efficiency of the sector, as measured by comparing the evolution of its economic growth with that of the most important pressures generated by it, differs widely. Thus, agriculture's gross added value (GAV) increased in 2007, interrupting the downward trend which had been present since 2003 and increasing from the low point reached in 2006. GAV grew by 7.9% between 2000 and 2007.

An ideal environmental efficiency would involve a clear decoupling between the sector's economic growth (GAV shows an upwards trend) and resource consumption (which shows a downwards trend); the behaviour of the three variables considered above is as follows:

Irrigated area remained relatively stable during the whole study period, increasing by only 3.7%, a figure lower than that seen for GAV. The sector's economic growth has therefore occurred at the expense of a slight increase in irrigated area, as seen clearly in 2007.

Fertiliser consumption per hectare has evolved in parallel with GAV since 2002. However, its growth over this period is clearly lower, with an overall decrease of 3.7%. This could therefore be interpreted as a sign of environmental efficiency as economic growth has been higher than growth in fertiliser consumption. Furthermore, since 2004 each unit of GAV has been achieved with a lower consumption of fertilisers per hectare. This trend reversed in 2007, however, when fertiliser consumption increased more than the sector's GAV.

The consumption of plant-protection products has shown a more unfavourable environmental behaviour as it has grown faster than GAV almost every year. This situation was particularly severe in 2004, when GAV decreased and plant-protection product consumption increased considerably. Plant-protection product consumption dropped very slightly (essentially stabilised) between 2006 and 2007 and GAV increased, a positive event which should be monitored closely in the coming years.

NOTES

- The sector's gross added value refers to agriculture, livestock farming, hunting and forestry (fisheries are not included).
- To calculate the indicator we assume that environmental efficiency is positive when the trend in the evolution of the sector's economic growth is decoupled [opposite and diverging] from that of the pressures generated on the environment.

SOURCES

- National Institute of Statistics. Spanish National Accounts. Base 2000. Accounting series 1995-2007. GDP at market prices (GAV for agriculture).
- Fertiliser consumption: Agrifood Statistical Yearbook, 2007. MARM. Data for 2007 are provisional.
- Plant-protection product consumption:
 - Spanish Plant Protection Association (AEPLA).
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- Irrigated area: Crop Area and Yield Survey (ESYRCE), various years. MARM.

MORE INFORMATION

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