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Global Agricultural Information Network

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Report Highlights:

Spain is the largest grower of Bt corn in the EU-28 and it has traditionally defended a science-based approach to agricultural biotechnology. The unusually warm conditions in summer 2015 contributed to an abnormally high presence of the corn borer, which has led farmers to an extensive use of GE corn in 2016.

Disclaimer: Spain, as a member of the European Union (EU), conforms to EU directives and regulations on agricultural biotechnology. It is therefore recommended that this report be read in conjunction with the [EU-28 consolidated report](#).

Table of Contents:

Section I. Executive Summary 4

Section II: Plant and Animal Biotechnology 5

Chapter 1: Plant Biotechnology 5

Part A: Production and Trade..... 5

a) **PRODUCT DEVELOPMENT 5**

b) **COMMERCIAL PRODUCTION..... 7**

c) **EXPORTS 10**

d) **IMPORTS..... 11**

e) **FOOD AID RECIPIENT COUNTRY 15**

f) **TRADE BARRIERS 15**

Part B: Policy..... 16

a) **REGULATORY FRAMEWORK..... 16**

b) **APPROVALS..... 18**

c) **STACKED EVENTS APPROVALS 19**

d) **FIELD TESTING 19**

e) **INNOVATIVE BIOTECHNOLOGIES 19**

f) **COEXISTENCE..... 20**

g) **LABELING 20**

h) **MONITORING AND TESTING 21**

i) **LOW LEVEL PRESENCE 21**

j) **ADDITIONAL REQUIREMENTS: 22**

k) **INTELLECTUAL PROPERTY RIGHTS (IPR) 22**

l) **CARTAGENA PROTOCOL RATIFICATION..... 23**

m) **INTERNATIONAL TREATIES AND FORA..... 24**

n) **RELATED ISSUES 24**

Part C: Marketing..... 24

a) PUBLIC/PRIVATE OPINIONS	24
b) MARKET ACCEPTANCE AND MARKET STUDIES:	25
<i>Chapter 2: Animal Biotechnology</i>	28
Part D: Production and Trade	28
a) PRODUCT DEVELOPMENT	28
b) COMMERCIAL PRODUCTION.....	29
c) EXPORTS	30
d) IMPORTS.....	30
Part E: Policy	30
a) REGULATORY FRAMEWORK.....	30
b) INNOVATIVE BIOTECHNOLOGIES	31
c) LABELING AND TRACEABILITY.....	31
d) INTELLECTUAL PROPERTY RIGHTS.....	31
e) INTERNATIONAL TREATIES/FORA	32
f) RELATED ISSUES	32
Not available.....	32
Part F: Marketing	33
a) MARKET ACCEPTANCE	33
b) PUBLIC/PRIVATE OPINIONS	33
c) MARKET ACCEPTANCE AND MARKET STUDIES.....	34
Related Reports	34

Acronyms used in this report

EC	European Commission
EU	European Union
FAS	Foreign Agricultural Service
MS	Member State(s)
MT	Metric ton (1,000 kg)
Ha	Hectares
GMO	Genetically Modified Organism
GE	Genetically Engineered
DDG	Distilled Dried Grains
N/A	Not available
GTA	Global Trade Atlas
MAGRAMA	Ministry of Agriculture, Food, Fisheries and Environment
EFSA	European Food Safety Authority

Section I. Executive Summary

Spain is the largest grower of Bt corn in the EU-28. Spanish area planted represents over 90 percent of total EU-28 area planted to GE crops. Spain continues to defend a science-based and pragmatic approach to agricultural biotechnology with regards to both cultivation and imports. Given Spain's structural shortfall of grains and protein crops, cultivation and imports of genetically engineered (GE) crops and products are essential for its robust export-oriented livestock sector.

MON810 corn has been commercially grown in Spain since 1998. Total area planted to corn varies every year based on water availability, irrigation costs, prices paid to farmers, pest presence and competition from alternative crops. The unusually warm conditions in summer 2015, contributed to an abnormally high pressure of the corn borer, which led farmers to an extensive use of GE corn in 2016.

Field trials are allowed in Spain, although subject to prior notice and authorization. Notifications to competent authorities for open field testing continue to decline steadily due to the unattractive investment environment for seed companies. In 2016, all notifications for deliberate release have been withdrawn by the requester. Hence, for the first time since 2003 no new field trials are being carried out in Spain.

After two sets of elections celebrated on December 20th, 2015 and June 26th, 2016 respectively, a minority government was only secured on November 29th, 2016. In the interim period, former cabinet ruled the country in *acting* capacity.

According to [Law 50/1997 \(in Spanish\)](#) on Government's role, an *acting* government's activity "shall be limited to the ordinary resolution of public affairs and shall not adopt any other measure except in the

case of emergencies or general interest, both duly confirmed.” Hence little regulatory development has been carried out in Spain this year.

As for GE animals, subject to prior notice and authorization, research is permitted and abides by the same rules as those for GE plant research. To date, competent authorities have not publically released notifications on confined research in animals. Most of the notifications in this area consist of basic science research for pharmaceutical purposes carried out by public institutions. To our knowledge, there is no known research or development of GE animals for human consumption in Spain.

There is no public register of research in cloning, and notification on cloning research is not mandatory. According to media information, cloning is limited to research activities focusing on endangered species, mice, hogs, and fighting bulls, none of them intended for the food chain.

Section II: Plant and Animal Biotechnology

Chapter 1: Plant Biotechnology

Part A: Production and Trade

a) PRODUCT DEVELOPMENT

Both confined research and deliberate release (cultivation) to the environment is permitted in Spain although subject to prior notice, public information, and authorization ([Law 9/2003 – in Spanish](#)).

Multinational companies that market their products in Spain have publically announced that varieties using innovative plant biotechnology (all new plant breeding techniques except transgenesis) will be made available in the near future, provided that a favorable regulatory framework is in place in market countries.

It is our understanding that Spanish-based seed breeding companies see the great potential of these innovative biotechnologies for their breeding programs. Clustered Regularly Interspaced Short Palindromic Repeats and associated proteins (CRISPR/Cas) is the technique considered among the most promising technologies.

While confined research may be carried out, breeding techniques such as CRISPR/Cas, mutagenesis or marker assisted selection are not subject of official authorization and do not need to be recorded.

Despite the confined research and deliberate release carried out in the country, no new GE development is anticipated to be in the market within the next five years.

For regulatory aspects of innovative biotechnologies, please see **Part B:** Policy Section e) Innovative Biotechnologies.

- Confined Research:

Confined research in Spain is permitted although subject to prior notice and authorization.

In 2016, competent authorities have only reported confined research in GE potatoes with different starch content levels. Additional research may be being performed, with notifications consisting of basic research for pharmaceutical purposes carried out by public institutions.

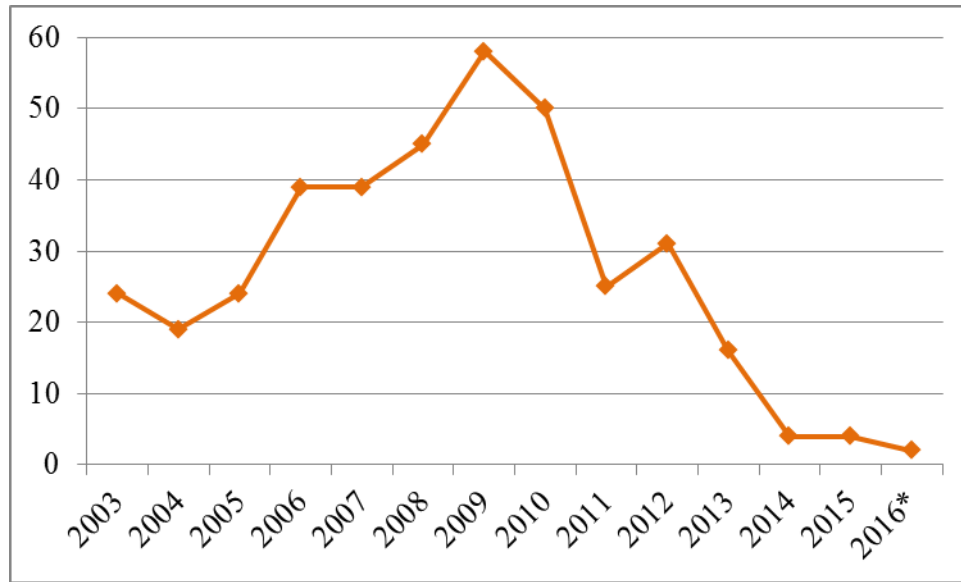
- Field testing:

Field trials are permitted in Spain although they are subject to prior notice and authorization.

To date, according to the Joint Research Center, in 2016, notifications for deliberate release into the environment of GE plants for any other purposes than placing on the market, are limited to corn and include amplification and evaluation of a transgenic corn line with biofortified endosperm with three vitamins and evaluation of a transgenic corn Bt line (Cry1Ac, Cry1C and Vip3) and its hybrid Carolight (CaroBt). Both notifications for deliberate release have been withdrawn by the requester. Hence, for the first time since 2003, no new field trials were carried out in Spain.

Notifications to competent authorities for open field testing continue to decline, reflecting private sector limited interest in developing GE crops adapted to Spain's conditions given the uncertain investment environment for seed companies.

Graph 1. Open Field Trials Notifications to Competent Authorities



Source: Foreign Agricultural Service (FAS) Madrid based on Joint Research Center Information.

**2016 data are based on data available up to November 1st 2016.*

b) COMMERCIAL PRODUCTION

Spain is the largest EU producer of Bt corn representing about 90 percent of the EU's total area. MON810 corn has been commercially grown in Spain since 1998. Total area planted to corn varies every year based on water availability, crop margins, competition from alternative crops and public incentives in place (**Table 1**).

According to the latest statistics available, total corn area declined by nearly 10 percent in Marketing Year (MY) 2016/17, registering a reduction in area planted for the fourth consecutive year. The corn area reduction in MY2016/17 is mainly explained by poor crop margins, competition by other crops and unfavorable conditions (excessive rain) during the planting season.

Additionally, the Castile and Leon Regional Government announced an exceptional measure for cases of extraordinary circumstances, such as when excess rainfall impedes planting, under which CAP payments will be granted regardless of whether crops—namely corn—are actually planted.

While crop diversification established by greening¹ may have played a role in reducing corn plantings, there are some corn growing areas, where area planted with corn is extremely inelastic as there are few options available.

Domestic production of GE corn is used by the robust domestic feed industry. Spain-based **feed grain** elevators do not keep separate production lines for GE and non-GE corn as practically all marketed feed contains GE soybean as a source of protein, and consequently it is default labeled as “contains GE products.”

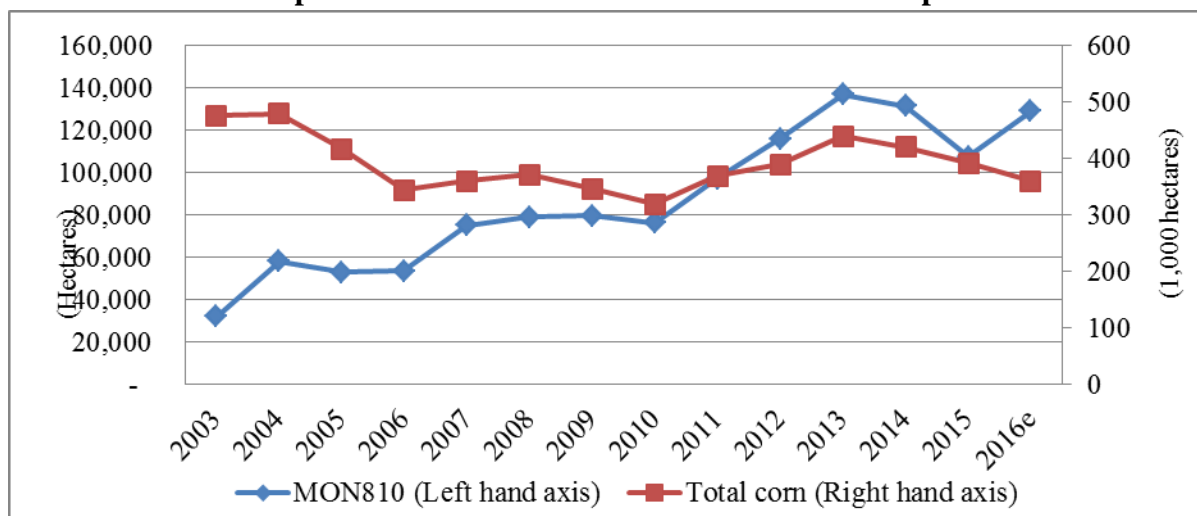
The corn processing industry whose production is intended to enter the **food chain** (wet millers and dry millers) source corn from GE free sources, in many cases under Identity Preserved (IP) programs.

Table 1. Spain’s Corn Area and Production*

Marketing Year	MY2012/13	MY2013/14	MY2014/15	MY2015/16	MY2016/17e
Area (1,000 Hectares [Ha])	360.8	431.7	421.6	392.0	361.1
Production (1,000 MT)	4,235	4,930	4,811.5	4,547.8	4,172.8

Source: MAGRAMA and FAS Madrid estimates. *Includes GE and non-GE corn.

Graph 2. Total corn and MON 810 corn area on Spain



Source: FAS Madrid based on MAGRAMA data².

¹ A large part of the support received by farmers (30%) is linked to greening measures. To comply with greening measures, crop diversification has to be observed. Farms between 10 and 30 ha must grow at least two different crops, and farms over 30 ha must grow at least three different crops in their arable land, which ultimately introduces slight variations in areas where monoculture is carried out.

² Since 2009, the Spanish Ministry of Agriculture, Food and Environment (MAGRAMA) publishes GE crop area including not only corn varieties in the national register in the EU common catalogue, but also those varieties

Area planted to Bt corn steadily increased up to **2013**, (**Graph 2** and **Table 2**) driven by an increased use of the technology that expanded to non-traditional areas. In **2014** this tendency was negated and Bt corn declined. Further decline in Bt corn area was registered in **2015**, when the corn borer incidence was high. In **2016**, a rebound in use of Bt corn has taken place. The abnormally high pressure of the corn borer in 2015 has led farmers to an extensive use of GE corn in 2016.

Table 2. Area of GE corn by Region (Hectares)

Region	2012	2013	2014	2015	2016
Aragon	41,669	54,451	54,041	42,612	46,546
Catalonia	33,531	33,996	36,381	30,790	41,567
Extremadura	15,952	16,979	13,815	9,827	15,039
Navarra	5,801	7,013	7,264	6,621	8,066
Castile-La Mancha	7,883	8,766	7,973	5,734	5,932
Andalusia	10,362	12,862	10,692	11,471	10,919
Others	1,109	2,895	1,371	695	1,011
Total	116,307	136,962	131,538	107,749	129,081

Source: MAGRAMA.

Final data for 2016 indicate that the Ebro River basin (autonomous regions of Aragon and Catalonia) has the largest share of GE corn, accounting for nearly 70 percent of Spain’s total GE corn plantings, as the corn borer is endemic in this area.

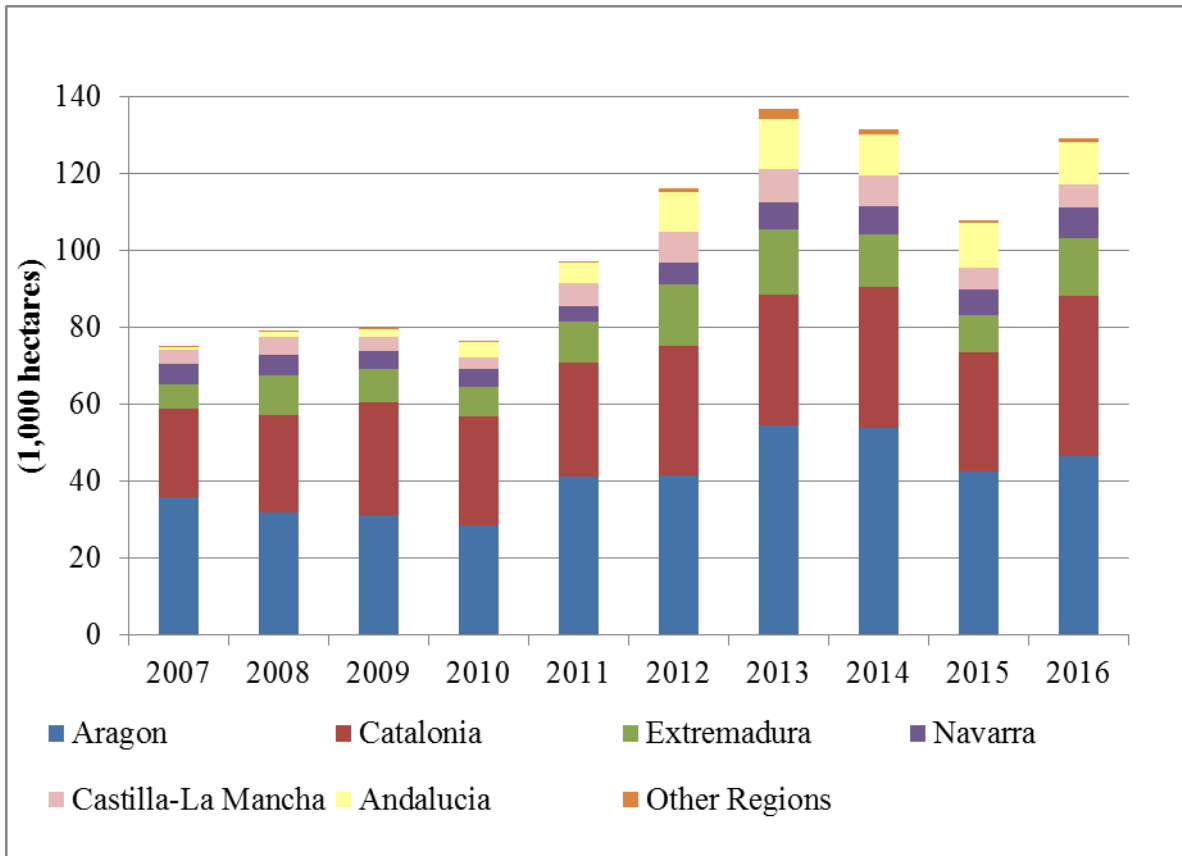
As MON810 is the only GE event approved for cultivation in the EU, possibilities of growth are limited to the size of the corn plantings in those areas where the corn borer represents a problem. Approvals of new traits for cultivation could raise the interest for GE crops in other regions of the country.

Additionally, the fact that the large majority of food manufacturers have eliminated GE products from food product composition to avoid labeling as “Contains GMOs” limits the option to grow GE crops to farmers supplying the animal feed industry.

The unusually warm conditions prevailing in summer 2015 (See [SP1514](#)) contributed to an abnormally high pressure of the corn borer, which has led to higher use of the technology in 2016. Hence, despite of the overall corn area decline (**Graph 2**), a rebound in GE corn area share in Spain has been registered (See **Graph 2** and **Graph 4**). The GE corn share of 35.7 percent represents a historical record.

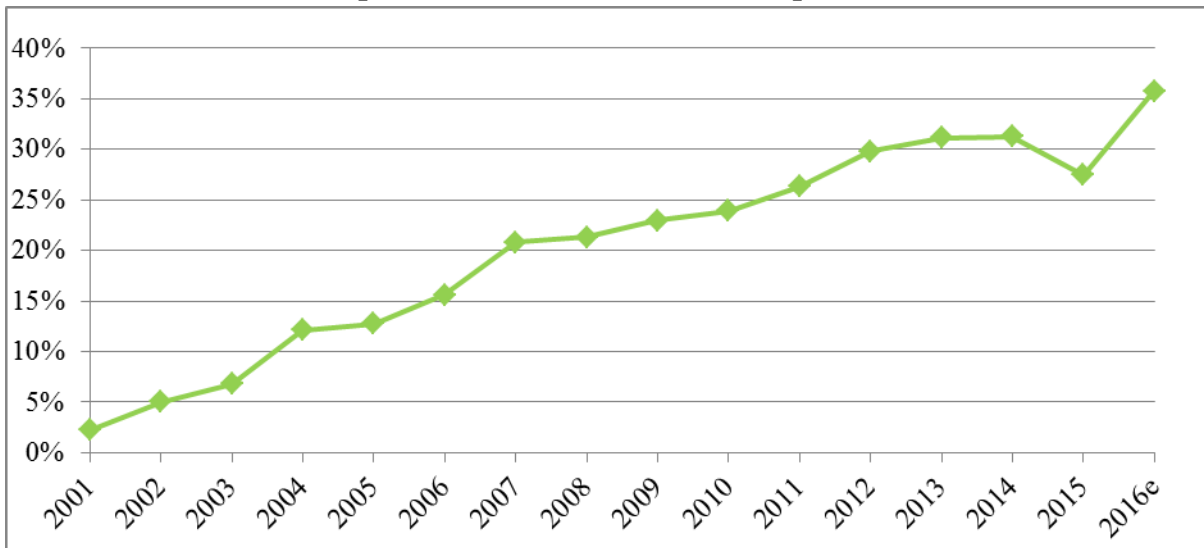
Graph 3. GE Corn Area by Region

granted with a provisional authorization. Figures from 2009 up to present in the chart above have been updated accordingly.



Source: FAS Madrid based on MAGRAMA data.

Graph 4. MON 810 Area Share in Spain (%)



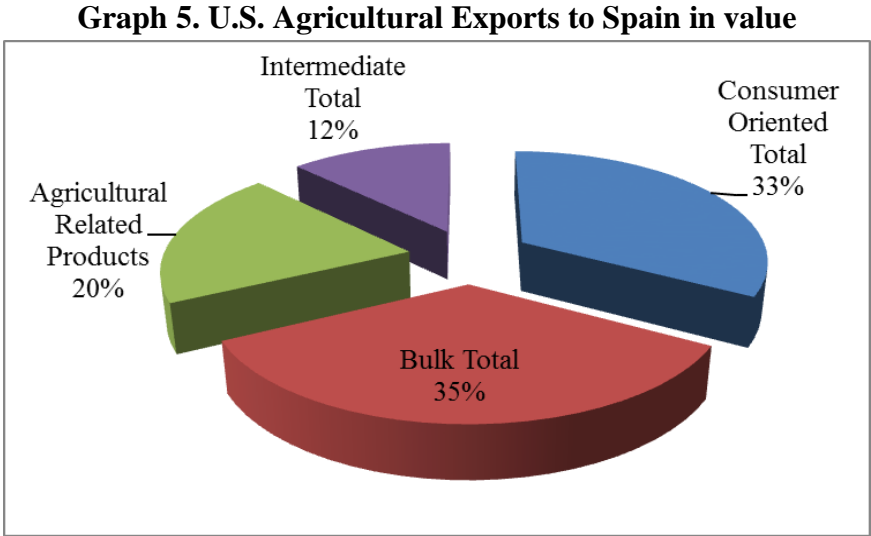
Source: FAS Madrid based on MAGRAMA data.

c) EXPORTS

Spain is a net importer of grains and oilseeds as domestic production is not sufficient to meet the demand of Spain’s robust export-oriented livestock sector. Hence, despite being the EU largest producer of GE crops, GE product exports are negligible as production is used up by the domestic feed industry.

d) IMPORTS

U.S. agricultural exports to Spain consist mainly of bulk commodities and consumer-oriented products, which accounted for 35 and 33 percent of the U.S. exports value in the period 2006-2015. Soybeans and tree nuts are the largest categories within these groups representing respectively nearly 20 and 30 percent of total agricultural trade (**Graph 5**).



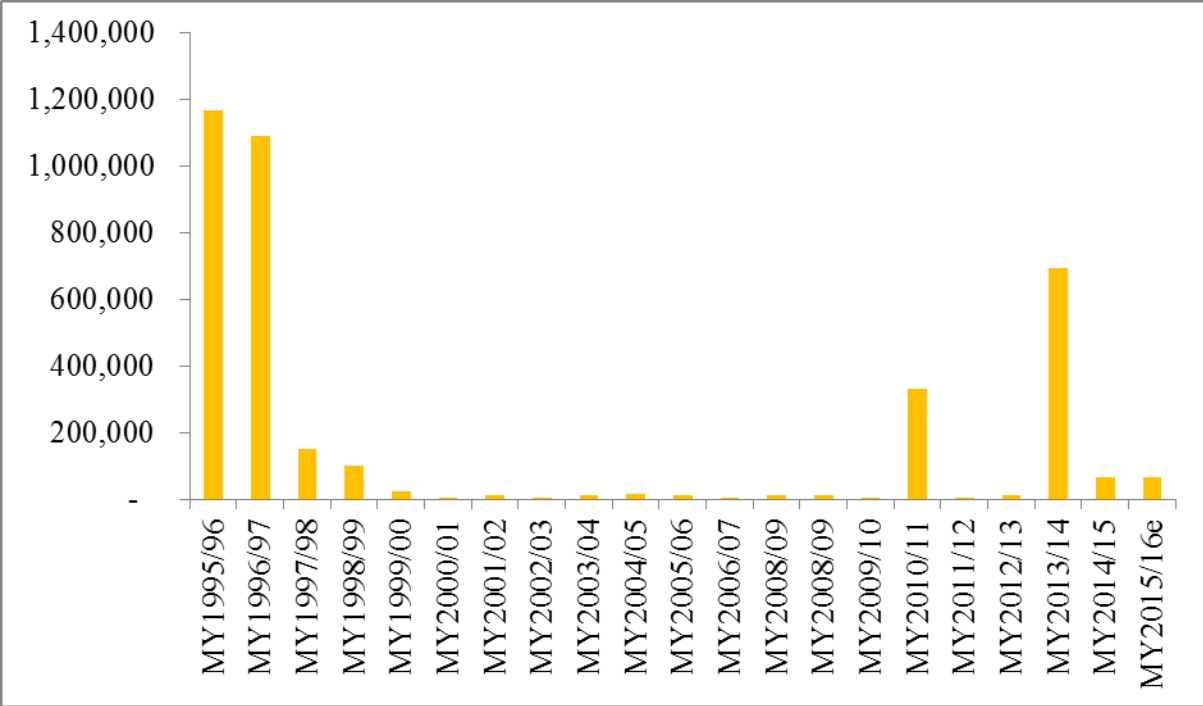
Source: FAS Madrid based on GATS data.

Spain imports a large amount of GE crops and products. The country’s dependency on imported feedstuffs and the science-based approach to GE crops have contributed to a high acceptance of the technology among farmers and ranchers, which has resulted in the expansion of GE crops cultivation and imports over the years. Products from agricultural biotechnology imported to Spain consist mainly of soybeans originating in Brazil and the United States and soybean meal originating in Argentina to be processed by the Spain-based crushing and feed industries respectively.

Spanish total grain imports rank from 9 to 12 million MT and soybean and soybean meal imports combined amount to nearly 6 million MT. Spain’s total corn imports have grown steadily over the last five marketing years due to increased price competitiveness compared to other feed grains. While corn imports have grown, the United States corn share of imports is negligible due to the fact that not all GE events produced in the United States are approved for import into the EU (asynchronous approval).

Graph 6 contains U.S. corn exports to Spain throughout the last 20 years. It shows a drastic decline of U.S. corn exports to Spain starting in 1998, when GE corn was first planted in the United States. This is a direct consequence of the asynchronous GE events approvals between the United States and the EU.

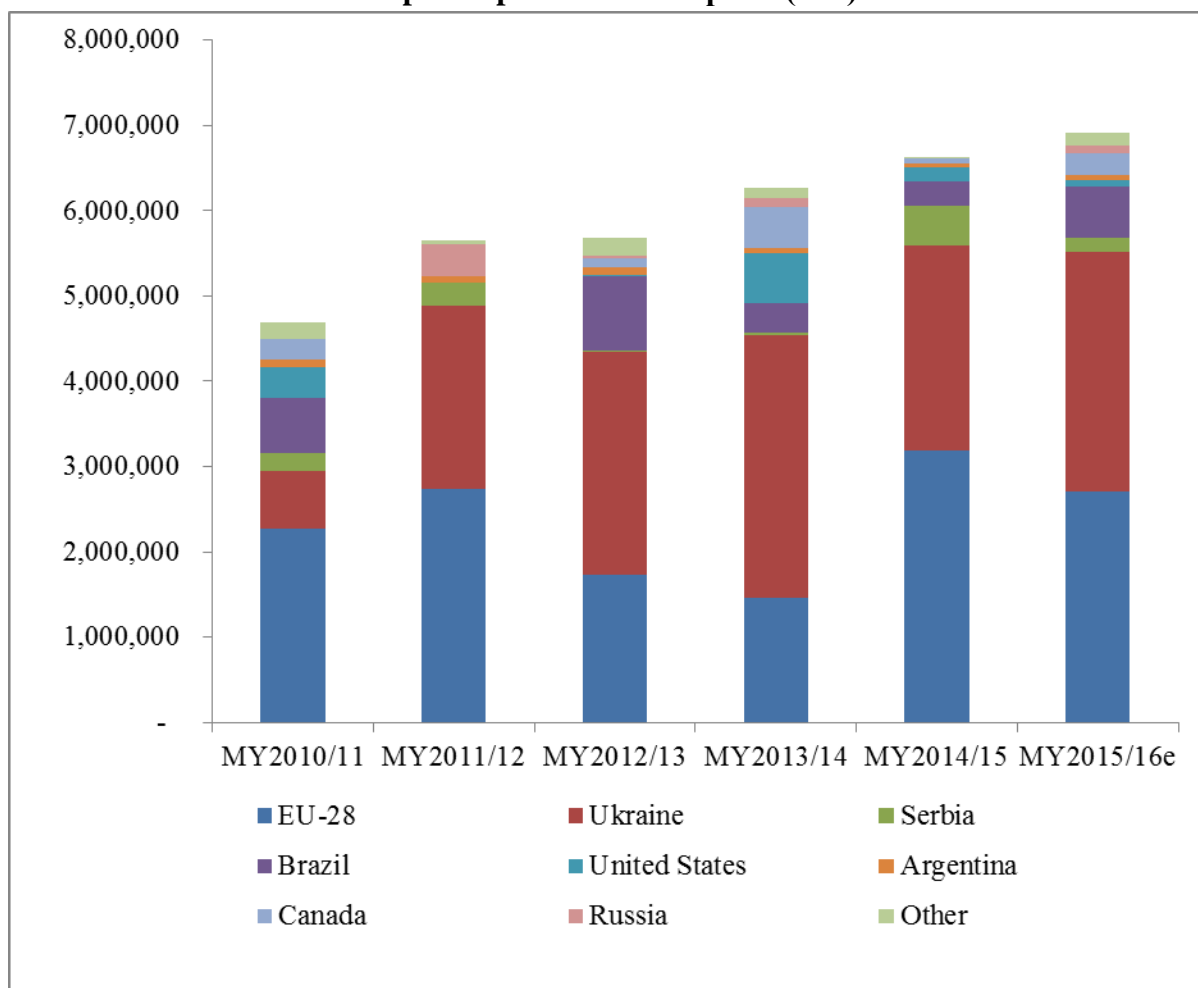
Graph 6. U.S. Corn Exports to Spain (MT)



Source: GTA and FAS Madrid Estimates.

Agricultural biotechnology adoption in Argentina and Brazil, who were also traditional corn suppliers to Spain, has forced Spain-based feedstuff importers to find alternative corn providers such as Ukraine, Serbia and Russia. Currently, intra EU trade and imports of Ukrainian corn supply the majority of the Spain’s grain imports (**Graph 7**).

Graph 7. Spain's Corn Imports (MT)*

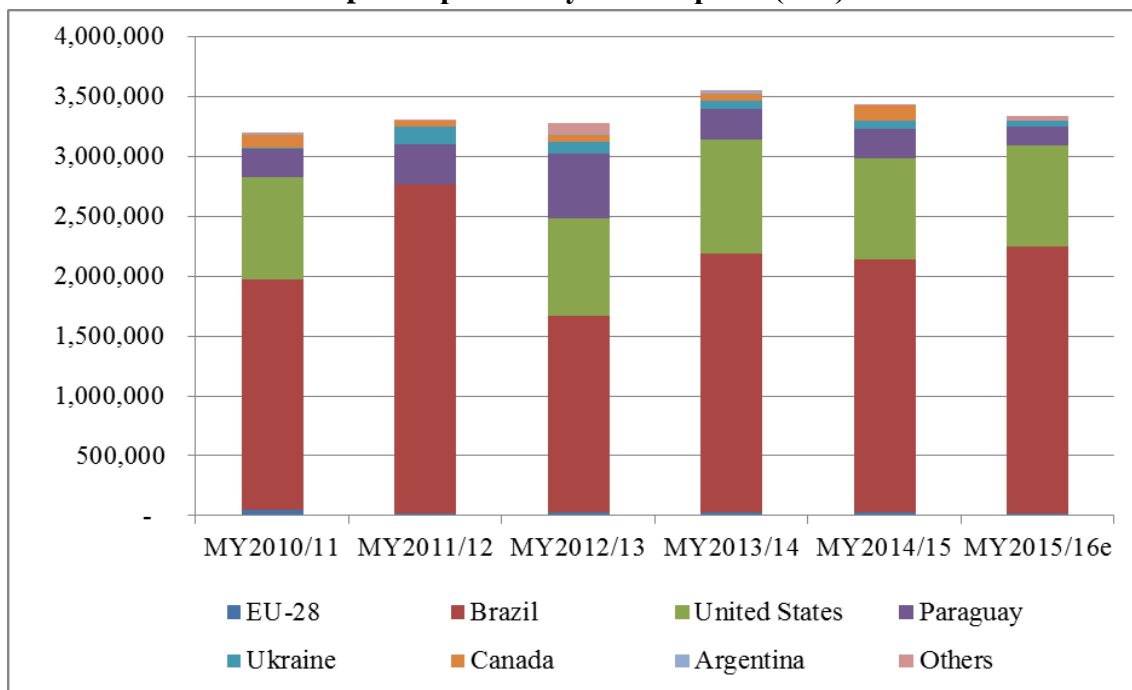


Source: Global Trade Atlas (GTA)

As it pertains to soybean and soybean products, the majority of Spain's imports are GE. Virtually all of the soybean products imported to Spain are GE, with the exception of those devoted to special markets niches. Nevertheless, the impact of the slower pace of approval has been less significant in the protein feed ingredients than in the grain sector of imports.

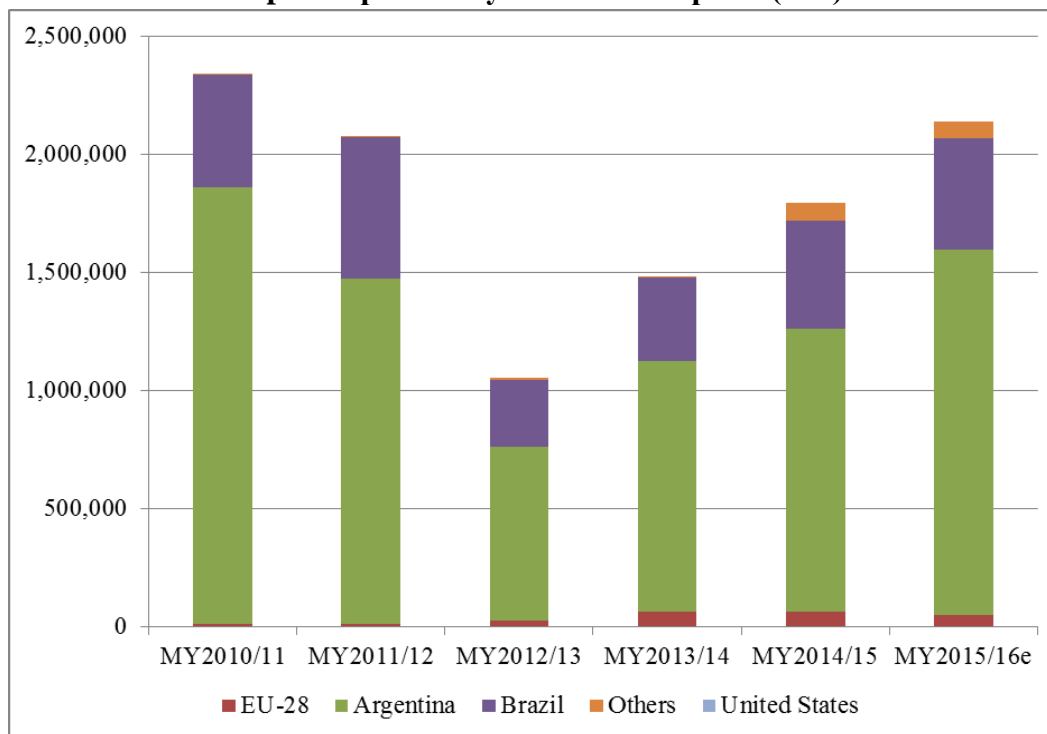
While Brazil and the United States supply the large majority of the Spanish soybean imports (See **Graph 8**), Argentina and Brazil combined supply most of the soybean meal import market (See **Graph 9**).

Graph 8. Spain's Soybean Imports (MT)*



Source: Global Trade Atlas (GTA)

Graph 9. Spain's Soybean Meal Imports (MT)*



Source: Global Trade Atlas (GTA)

e) FOOD AID RECIPIENT COUNTRY

Spain is not a recipient of food aid and it does not provide GE commodities for food aid.

While in the case of emergencies, when the local markets have collapsed, in-kind food aid may be given, normally, in order to avoid pushing local down prices and discouraging domestic production in recipient countries, local purchases in recipient countries are preferred.

Spain is founding member of IFAD (International Fund for Agricultural Development), the UN Agency created to enable poor rural people to overcome poverty and hunger. It is also a member of FAO and a strong supporter of the WFP.

Within Spain's Ministry of Foreign Affairs and Cooperation, the Spanish Agency for International Development Cooperation (AECID) created in 1988, is responsible for elaboration, execution and management of the cooperation programs and projects, either directly, through its own resources or the collaboration with other national or international organizations and Non-Government Organizations (NGOs).

This Agency, ascribed to the Under-Secretariat for International Cooperation (SECI) has an extensive structure overseas. Every four years, AECID establishes sector's horizontal priorities through its Master Plan, the 2013-2016 strategic document can be consulted in the [link](#).

f) TRADE BARRIERS

- **For bulk commodities and consumer-oriented products**

The asynchronous approval of GE events cultivated in the United States yet not authorized for import to the EU-28 remains the main trade barrier.

The expansion of GE crop production in traditional grain supplying countries had a significant impact on trade flows to Spain. For instance, in the corn market, Ukraine, Serbia and Russia have progressively increased their market quota over the years at the expenses of lower imports from the United States, Argentina and Brazil (See **Graph 7**). Additionally, the little room for adventitious presence for non-approved events continues being a constraint for traders, who carry out a no-risk policy in their purchases.

The presence of GE labels on **consumer-oriented** products is very limited in the Spanish market. The large majority of food manufacturers and processed food importers have either eliminated GE ingredients from food product composition or switched to GE free suppliers, respectively in order to avoid labeling and marketing food products with the claim "Contains GMOs".

- **For Seed :**

Seed trade is affected by the zero tolerance of adventitious presence. The fact that the EU-28 only allows cultivation of MON 810, serves as a trade barrier for U.S. seed exports containing or with adventitious presence of other GE events. A threshold level for adventitious GE material presence has not yet been set. As a consequence, Spain is forced to source its GE seeds from a limited number of origins (Chile, South Africa, domestically produced seeds and the United States to some extent).

Part B: Policy

a) REGULATORY FRAMEWORK

The EU's agricultural biotechnology policy agenda and rules are set in Brussels. As an EU Member State (MS), Spain must abide by EU rules, which in the case of Regulations are directly applicable to all EU MS. EU Directives need to be transposed into national laws, so they provide the opportunity for Member States governments to exercise some discretion without altering the basic scope of the EU directive. For more information on EU-28 Agricultural Biotechnology Regulatory Framework please see [EU-28 report](#).

In the field of agricultural biotechnology, the EU [Directive 2001/18](#) on the deliberate release into the environment of "genetically modified organisms (GMOs)" was transposed to national regulation by [Law 9/2003 \(in Spanish\)](#) on confined use and voluntary release of "GMOs".

This same piece of regulation created and defined the responsibilities of the two relevant authorities that weighed in on Spain's agricultural biotechnology decision making process, which are the National Biosafety Commission (CNB) and the Inter-ministerial Council for Genetically Modified Organisms (CIOMG). The CNB takes a scientific approach, whereas CIOMG's approach is technical.

At the national level, central and regional governments hold different responsibilities:

The central administration is responsible for:

- The marketing authorization for "GMOs" and products containing "GMOs."
- Authorizing confined use and deliberate release of "GMOs" for research and development (carried out under national programs).
- Authorizing pharmaceutical products for humans or animals containing "GMOs."
- Monitoring and control of field trials previous to the registration in the Commercial Varieties Catalogue.

The autonomous regions administrations are responsible for:

- Authorizing confined use and deliberate release of “GMOs” for research and development
- Monitoring and control of these activities, (with the exception of those belonging to the national government portfolio)

National Biosafety Commission (CNB)

The National Biosafety Commission is an advisory body whose role is to assess the requests for cultivation, confined use and marketing of GE products submitted at either the national or regional level with a scientific approach. The CNB is comprised of representatives from different ministerial departments, representatives of the autonomous regions and experts in agricultural biotechnology. This Commission is chaired by the Director General of Environmental Quality and Assessment and Natural Environment. The composition of the CNB is available in the [link \(in Spanish\)](#).

Inter-ministerial Council for GMOs (CIOMG)

The CIOMG takes a technical approach, and it is the competent authority to grant nationwide authorizations for confined use, voluntary release and marketing of products derived from biotechnology. The CIOMG coordinates its work with the CNB and liaises with the European Commission and the Autonomous Communities. This Council is chaired by the Secretary General for Agriculture and it is comprised by representatives of the Ministries that are somehow related to agricultural biotechnology. It includes representatives from the Ministry of Agriculture, Food, Fisheries and Environment (MAGRAMA), the Ministry of Health, Social Services and Gender Equality (MSSSI), Minister for Economic Affairs and Competitiveness (MINECO) and the Ministry of Internal Affairs (MIR). The composition of the CIOMG is available in the [link \(in Spanish\)](#).

Other Ministerial departments involved

The Spanish Office of Vegetal Varieties, belonging to the Directorate General for Agricultural Productions and Markets, is responsible for registering and monitoring of GE seed for planting. Information on the corn varieties registered for planting in Spain is available in the [link \(in Spanish\)](#). At present there are nearly 115 GE corn varieties approved for commercial cultivation.

Within the MAGRAMA, the Sub directorate General for Animal Feed and Resources Preservation coordinates the National plan in feedstuffs whereas the Spanish Consumption, Food Safety and Nutrition Agency (AECOSAN), ascribed to the Ministry of Health, Social Services and Equality is in charge of the food chain control.

Other non above listed Ministerial Departments weigh in to the agricultural biotechnology decision process through their participation in the Inter-ministerial Council for GMOs (CIOGM) or the National Biosafety Commission (CNB).

Civil Society Participation - Consultative Committee for GMO

While the cultivation of GE crops is permitted, Spain is also strengthening public information and participation. The Consultative Committee for “GMO” (CPOGM) ascribed to the Inter-Ministerial Council was created in October 2010 by [Ministerial Order 2616/2010 \(in Spanish\)](#). This body’s main objective is to reassure public participation in agricultural biotechnology issues so that the Inter-Ministerial Council obtains first-hand information of civil society representatives. The CPOGM can express its opinion on decisions to be taken and it is entitled to prepare proposals to be examined by the CIOMG. The CPOGM is comprised by representatives of farmers’ unions, agricultural cooperatives, consumers’ organizations, labor unions, conservation non-governmental organizations, food industry, pharmaceutical industry, the entrepreneurial organization and the national network for rural development. The seed breeding industry is not represented in this consultative group.

b) APPROVALS

- For imports:

Approvals of events for imports are dealt with at the EU level. Please see the European Commission [website](#) for a list of approved GE events.

Member States have the chance to weigh in on the approval process through their participation in the EU committees, both at the technical and political level. For more information on the EU approval process, please see [EU-28 Biotechnology Report](#).

With only a couple of exceptions, Spain has traditionally voted in favor of new events for imports in the Standing Committee on the Food Chain and Animal Health in Brussels.

Spain has a two-tier system for the national decision making process to come up with the country’s position:

- The CNB carries out the risk assessment
 - The CIOMG decides the country’s position taking into consideration CNB assessment.
- For cultivation:

Spain's position on renationalization of cultivation decisions evolved through the years. When this debate was first launched, Spain reacted cautiously putting forward concerns over common market implications and WTO rules compliance.

However, Spain voted in favor of the renationalization of cultivation decisions in what we understand as an attempt to open the door to cultivation of new events. Initially, the transposal to Spanish law of [Directive \(EU\) 2015/412](#) on the possibility for the Member States to restrict or prohibit the cultivation of genetically modified organisms in their territory was going to be carried out in 2016.

However, [Law 50/1997](#) (in Spanish) on Government's role, sets that acting government's activity "shall be limited to the ordinary resolution of public affairs and shall not adopt any other measure except in the case of emergencies or general interest, both duly confirmed", having hence no capacity to transpose this piece of EU regulation to National Law.

[Directive \(EU\) 2015/412](#) sets April 3, 2017 as limit for transposal to National Law.

c) STACKED EVENTS APPROVALS

Based on EU regulations, approval procedures for single and for stacked events are the same.

d) FIELD TESTING

Field trials are permitted, although subject to prior notice. (More information in Section a) Product Development within **Part A: Production and Trade**.)

e) INNOVATIVE BIOTECHNOLOGIES

There is little official information on innovative biotechnologies being utilized in Spain, as for the time being, techniques such as mutagenesis or marker assisted selection are not subject of notification or authorization and do not need to be recorded.

On request of the Cibus Company, the Spain's National Biosafety Commission (CNB) studied Cibus rapeseed (an herbicide tolerant rapeseed obtained through oligonucleotide-mediated mutagenesis). On their October 9th 2014 meeting took, whose [summary](#) (in Spanish) publically available in the Ministry of Agriculture, Food, Fisheries and Environment website, the CNB board members informed that they had concluded that the Cibus Rapeseed should be excluded from the scope of Directive 2001/18. However, if the company decided to carry out field trials additional information on the trial conditions, development and outcome would be required.

Spain's competent authorities are waiting for additional guidance from the European Commission on Innovative Biotechnologies. Additional information can be found at [E16013](#).

For more information see Section a) Product Development within **Part A: Production and Trade**.

f) COEXISTENCE

Despite being the EU's largest GE crop grower, Spain has not yet implemented a coexistence regulation.

A first draft of a coexistence decree was made public in 2004 but abandoned due to the lack of consensus among the interested parties. Despite the lack of coexistence measures, Spanish farmers continue to grow GE corn without any incident between farmers.

The Spanish agricultural administration would prefer clearer EU wide rules to develop coexistence plans to be provided by the European Commission, as opposed to national measures.

At present, coexistence in Spain is managed by following the good agriculture practices promoted by ANOVE, the National Association of Seed Breeders, which is published on a yearly basis and handed out along with seeds by the seeds distributors. Latest version of the recommendations is available in the [link \(in Spanish\)](#).

Having said that, as a result of [Directive \(EU\) 2015/412](#) implementation, Spain will need to implement appropriate measures in border areas of their territory to avoid possible cross-border contamination into neighboring Member States in who may decide not to grow GE crops.

g) LABELING

Spain follows EU-harmonized legislation on labeling ([Regulation European Commission \(EC\) 1829/2003](#) on Genetically Modified Food and Feed, and [Regulation \(EC\) 1830/2003](#) on the Traceability and Labeling of Genetically Modified Organisms) and there is no "non-GMO" labeling regulation developed at the national level.

The EU food labeling regulations provide for a 0.9 percent threshold for the "adventitious," that is, accidental and technically unavoidable, presence of EU-authorized GE event in a non-GE food or feed. Food or Feed products containing amounts above 0.9 percent per ingredient must be labeled as "Contains Genetically Modified Organisms".

Bt corn planted and harvested in Spain is mainly utilized for the production of domestic compound feed, which is by default labeled as containing "Genetically Modified Organisms" since the large majority of the soybean meal used in feed production is GE.

To avoid labeling as “Contains GMOs,” on food packaging, the large majority of food manufacturers have eliminated GE products from food product composition.

More detailed information on the EU-harmonized labeling legislation is available in the [EU-28 FAIRS Report](#) well as the [USEU website section on labeling](#).

h) MONITORING AND TESTING

Spain monitoring and testing system is based on EU set rules. However, due to the country decentralized structure, testing and controlling are carried out at the regional level, while central government has the authority over customs.

The Autonomous Regions establish their own monitoring and sampling plans throughout the food and feed chain coordinated by national authorities. Sampling plans are based on risk assessment and it is primarily done at the wholesale and the processing level.

Spain uses the [Rapid Alert System for Food and Feed \(RASFF\) database](#) to report food safety issues to consumers, the trade, and other member-states. Since 2014 until today, no shipments have been rejected due to unauthorized presence of GE products in Spanish Border Inspection Points.

i) LOW LEVEL PRESENCE

As a member of the EU, Spain conforms to EU directives and follows EU regulations on agricultural biotechnology. Since July 2011 the EU legislation sets at 0.1 percent³ the 'technical zero' level for shipments devoted to the **feed** market.

However, for products that will enter the **food** chain the tolerance is zero. As a consequence, adventitious presence continues to be a concern for traders, who carry out a no-risk policy in their purchases, regardless the final use.

The Spanish food industry would support a low-level presence (LLP) solution for food. At the government level, Spain’s position is decided through the CIOMG, which puts together representatives of each Ministry involved in the regulation of agricultural biotechnology (See **Regulatory Framework**

³ *This level corresponds to the lowest level of GE material taken into account by the EU reference laboratory for the validation of quantitative methods. It is only applicable to “adventitious” presence in feed material of non-approved products of agricultural biotechnology for which an authorization procedure is pending in the EU or for which an authorization has expired.*

Section). However, in those matters affecting directly consumers, such as LLP for food, AECOSAN plays a bigger role in the Council decisions.

In the case of **seeds**, a threshold level for adventitious GE material presence has not yet been set. As a consequence, Spain is forced to source its GE seeds from a limited number of origins (Chile, South Africa, domestically produced seeds and the United States to some extent). The domestic seed breeding industry continues to request the definition of a threshold limit of adventitious presence in seeds to open the trade to other seeds producers.

j) ADDITIONAL REQUIREMENTS:

- GE Crops Field Register:

While it was largely debated in the past, at the moment, there is no national registry of commercial GE fields in Spain. The Spanish agricultural administration is reluctant to publish the location of commercial GE crop plots, which could be misused.

Currently, the only information publically available about commercial GE crops plantings in Spain is the total area at the province, regional and national level that is calculated based on GE seed sales records, and it is publicly available at the Ministry of Agriculture, Food, Fisheries and Environment [website \(in Spanish\)](#).

k) INTELLECTUAL PROPERTY RIGHTS (IPR)

The Community Plant Variety Right (CPVR), issued by the Community Plant Variety Office ([CPVO](#)) in Angers, (France), provides intellectual property rights for protection of plant varieties. However, the European Patent Convention (EPC) of October 1973 excludes patents for plant varieties. The CPVR enables breeders to be granted a single intellectual property right operative across the EU. The CPVR coexists with individual Member States' national plant protection legislation as an alternative form of protection.

Spain has its own Plant Varieties Protection System although harmonized with the EU regulations so that Common Market rules are observed. Plant Varieties Protection Rights are regulated by [Law 3/2000 \(in Spanish\)](#) that harmonizes Spanish legislation with EU Regulation and the Union for the Protection of New Varieties of Seeds (UPOV) rules.

Within the Ministry of Agriculture, Food, Fisheries and Environment, the Spanish Office for Plant Varieties (OEVV) manages import requirements, seed registration and certification, and commercial seed catalogs for planting seeds and nursery products.

Spain has a two-step registration process. The OEVV manages a National Catalogue of Commercial Varieties that can be freely marketed in the country and a National Catalogue of Protected Varieties. This system allows breeders to assess varieties potential and to get farmer's feedback before incurring in the further costs implied in the protected varieties registration.

- The Register of Commercial Varieties enables breeders to start reproducing and commercializing plant varieties in Spain.
- Register of Protected Varieties enables the owner to collect property rights and the carry out the exclusive exploitation of a plant variety Spain.

An application form has to be presented for new plant varieties to be registered in the Commercial Varieties Catalog. Prior to their registration in the Commercial Varieties Catalog the new varieties are tested to verify that they meet the condition of being different, homogeneous and stable.

The registration in the Protected Plant Varieties Catalog is voluntary. The Spanish law on Plant Varieties Protection Rights intends to provide seed breeders' with a 25 years protection period for those varieties in the Protected Plant Varieties Catalog.

It is not possible to hold protection for the same plant variety under both the Community and a national system at the same time. When a variety is granted with the CPVR the breeder has to choose whether to keep the national or the European right. GE seed breeders opt for the Community protection over the national protection.

MON810 is the only GE event commercially grown in Spain and, as with most of the corn cultivated in Spain, including GE varieties, it is a hybrid. IPR is not an issue for Spain's GE crops as hybrid seeds are not replanted.

1) CARTAGENA PROTOCOL RATIFICATION

The EU is a signatory to the Cartagena's Biosafety Protocol (Protocol), and so is Spain as a Member State of the European Union. Spain adhered to the Protocol on January 2002.

At the national level, the Protocol is followed by the Ministry of Agriculture, Food, Fisheries and Environment and in particular, the Support Unit within Directorate General for Agricultural Production and Markets (protocolo.cartagena@magrama.es). Spain regularly attends to the Cartagena Protocol Meeting of Parties.

Additional information on the Cartagena's Biosafety Protocol can be found in its [official website](#).

m) INTERNATIONAL TREATIES AND FORA

Spain's participation in international treaties and fora is not different from that of the EU. For more information on this regard it is recommended to read the [Consolidated EU-28 Biotechnology Report](#).

n) RELATED ISSUES

- GE-free Zones:

Aside from the commercial production and research areas for GE crops, some Spanish municipalities/provinces have declared themselves GE free zones. These zones are created by political declaration at the municipality, province or regional level. Most of these areas are located in regions where the type of agricultural production cannot benefit from the current GE events available for cultivation in the EU. It is our understanding that there is no legal enforcement mechanism connected to this declaration that would prevent a farmer from growing GE plants in these zones.

Part C: Marketing

a) PUBLIC/PRIVATE OPINIONS

Spain's government has traditionally taken a pragmatic and science-based approach to the agricultural biotechnology regulatory process. Spain works hard to ensure that science is an important ingredient in the decision making process. Spain defends the role of the European Scientific institutions.

Within the agricultural sector, biotechnology is perceived as a tool to improve the competitiveness of farms through higher yields and lower input use. The use of agricultural biotechnology is also considered beneficial for the agro-food sector as a whole given the country's dependency on imported raw materials.

The large majority of Spain's farmers associations are in favor of planting GE crops. The use of agricultural technologies such as biotechnology or irrigation systems to improve competitiveness and obtain consistent output levels are positively perceived and defended by a large majority of the farming sector.

However, since Bt corn is the only GE crop currently approved for cultivation in the EU, not all farmers benefit directly from the use of agricultural biotechnology. Approval of new traits that would address

issues affecting different crops, or crops oriented to consumers' benefits would raise the interest among other growers, regions and/or consumers.

The Spanish feed and livestock industries have been traditional supporters of agricultural biotechnology. Spain boasts of one of the EU largest livestock sectors and, in the case of the pork sector, exports nearly one third of the production to EU and third markets. Consequently, given that livestock producers face global competition and Spain's dependency on imported feedstuffs, the Spanish feed and livestock industry have claimed on numerous occasions an increased access to GE products will help them compete equally in the world markets.

There is not a strong reaction from Spanish retailers or meat consumers to meat fed with GE feed.

b) MARKET ACCEPTANCE AND MARKET STUDIES:

The presence of GE labeled consumer-oriented products is very limited in the Spanish market. The large majority of food manufacturers have eliminated GE products from food product composition to avoid labeling as "Contains GMOs."

On the contrary, the large majority of livestock breeders use compound feed labeled as containing "Genetically Modified Organisms" and the GE-free feed market niche is rather small.

Meat obtained from animals fed with GE feed does not have to be labeled so end consumers cannot show a preference in their meat purchases.

There are not many recent country-specific studies on marketing or acceptance of agricultural biotechnology in Spain.

In regards to public perceptions on agricultural biotechnology, Eurobarometer 2010 concluded that Spain's index of optimism for agricultural biotechnology/genetic engineering was among the highest within the EU (74 percent) and so is Spain's support for GE food (35 percent of respondents agreed or totally agreed that GE food should be encouraged).

In a [Eurobarometer survey](#) carried out in 2011 regarding environmental issues that worried citizens, Spanish citizens showed less concern over the use of GE crops than the EU average (13 percent versus 19% of the Europeans). Moreover, Spaniards were far more concern about agricultural pollution originated by the use of fertilizers and pesticides (26 percent compared to 25 percent of the Europeans).

In a more recent study (August 2013) carried out by the Food and Resource Economics Department from the University of Florida [comparing perceptions of biotechnology in fresh versus processed food](#) Spain was categorized as a country with low-rejection of GE food. The study also stated that

respondents in Spain showed optimistic attitudes of towards the benefits of agricultural biotechnology and a high proportion of them were assigned to a GE tolerant cluster. The University of Florida study concluded that the benefit valued the most from respondents in Spain was the reduction of pesticide use that genetic engineering allowed.

Regarding GE crops production benefits, a study on “[How can specific market demand for non-GM maize affect the profitability of Bt and conventional maize? A case study for the middle Ebro Valley, Spain](#)” published in 2012 by the Spanish Journal to Agricultural Science, a publication managed by INIA (Spanish Public Agricultural Research Institute), concluded that the use of Bt corn in Spain increases farmers’ partial gross margins ⁴by 95 Euros per hectare on average.

Another study published in November 2016, entitled “[Bt maize cultivation in Spain: Economic, social and environmental benefits \(1998-2015\)](#)” and founded by the Antama Foundation⁵, highlighted how the cultivation of Bt corn in Spain since has reduced total corn imports by more than 853,000 MT.

A study entitled [Genetically Modified Soy: an irreplaceable raw material in the EU. Assessment of Alternatives and Economic impact on the Spanish Feed and livestock farming sector](#), by Francisco J. Areal. University of Reading (United Kingdom) concludes that soybean products are key for feed production given its high protein content and its high protein price competitiveness. Genetically engineered soybean and products imports to Spain during the period 2000-2014 has meant 55,000 million euros in savings when compared to the alternative of importing conventional soybean and products during the same period. According to this study, the replacement of GE soybean products by conventional soybean products would mean a price increase of soybeans and soybean meal by 291% and 301%, respectively.

The study “[Economic, Social and Environmental Benefits of Bt corn cultivation in Spain \(1998-2015\)](#)” (in Spanish) by Francisco J. Areal. University of Reading (United Kingdom) released in 2016 highlights the benefits of biotech cultivation in Spain in terms of increased yields and crop margins, reduced import needs, improved corn health (lower mycotoxins incidence) and additional net CO₂ fixation.

⁴ In the study “Partial gross margin” is defined as the difference between farmer’s income and those variable costs which may be different in Bt and conventional maize production (i.e. seed and pesticide costs). Other variable costs not affected by the choice of Bt or conventional maize production were not included in the partial gross margin analysis (i.e. costs which may not be different between both crops, such as herbicide treatments, fertilizers and energy and water use).

⁵ Fundacion Antama is a non-profit organization that promotes awareness of new technologies applied to agriculture. The Foundation is supported by the seed companies based in Spain and institutions in favor of agricultural biotechnology.

Chapter 2: Animal Biotechnology

Under Animal Biotechnology, Animal Genetic Engineering and Animal Cloning are included. While Animal Genetic Engineering implies modification of the animal's DNA, animal cloning is a type of assisted reproduction which does not modify the animal's DNA but, on the contrary it can contribute to preserve valuable genetic characteristics of livestock animals or endangered species.

Part D: Production and Trade

a) PRODUCT DEVELOPMENT

There is no known research or development of GE animals intended for the food market in Spain.

Research conducted using **animal biotechnology** is permitted although it is subject to prior notice through the same procedure and institutions as plant biotechnology. According to the public log managed by the Spanish Ministry of Agriculture, Food and Environment, notifications of confined research on GE animals throughout 1998-2016 was carried out with hogs, mice and zebra fish. It is our understanding that most of the notifications consist on basic science research for pharmaceutical or medical purposes carried out by public institutions.

Table 3. Confined Research with GE Animals Notifications

Year	Hogs	Mice	Zebra fish
1998	x		
1999		x	
2000		x	
2001		x	
2002		x	
2003		x	
2004		x	
2005		x	
2006		x	
2007		x	
2008	x	x	
2009		x	
2010		x	
2011		x	x
2012		x	x

2013		x	
2014	x	x	x
2015	x	x	
2016		x	

Source: FAS Madrid based on MAGRAMA data

Research on animal genome editing is being carried out in Spain by public Institutions such as the National Center for Biotechnology (CNB). Basic research with CRISPR-Cas9 in mice has been carried out since 2013. Additional information can be found in the [link](#).

As for **cloned animals**, in Spain, Somatic Cell Nuclear Transfer (SCNT) has occurred since 2003. Currently, public research centers and universities are trying to learn and improve the technology. No private companies are involved so far in this kind of research.

There is no public register of research in cloning and notification on cloning research is not mandatory. According to information provided by media, cloning is limited to research activities and attempts include so far:

- Wild goat by Scientifics from the Centre of Research and Agro-food Technology of Aragon (CITA) along with colleagues from the National Research Institute of Agriculture in Madrid (INIA) in 2003.
- Cloned mice by a public institution (Department of Cell Biology, Physiology and Immunology at the Autonomous University of Barcelona (UAB) in 2009.
- Cloned swine by the Department of Animal reproduction at the Murcia University in 2009
- Cloned bullfighting bull by researchers at Valencia's foundation for Veterinarian Investigation along with the Center for Investigation Prince Felipe in Valencia in 2010. Reportedly, this bull did not present the original bull's desired behavior and was dismissed from breeding purposes.
- Reportedly, in 2014 Scientists from the Centre of Research and Agro-food Technology of Aragon (CITA) failed to collect enough funds for a second attempt to clone a Pyrenean Wild goat.

b) COMMERCIAL PRODUCTION

There are neither GE animals nor cloned animals commercially used in Spain. There is no production of GE animals or clones intended for the food market in Spain. GE animals in Spain are authorized for research purposes.

c) EXPORTS

Spain does not produce commercial **GE animals, clones** or products; hence there are no known exports within these categories.

d) IMPORTS

GE animals have been imported to Spain for research purposes. Genetically engineered animal imports are subject of notification to customs authorities.

Since import documents do not indicate whether embryos or semen is sourced from a **cloned animal**, the Spanish livestock industry may have imported semen and embryos from cloned animals.

e) TRADE BARRIERS

At the moment, there are no known trade barriers related to GE or cloned animals.

Part E: Policy

a) REGULATORY FRAMEWORK

Genetically engineered animals are ruled by the same authorities as GE crops and notifications for confined use or release to the environment are regulated by the same provisions (See **Chapter 1. Part B: Policy. Regulatory Framework**). Additionally, specific regulations for animal research were introduced by [Royal Decree 53/2013 \(in Spanish\)](#).

Regarding **cloning**, there are two ministerial departments involved in the position definition: the Ministry of Agriculture, Food, Fisheries and Environment and the Ministry of Health.

- Ministry of Agriculture, Food and Environment: Within the Ministry of Agriculture, Food and Environment, there are different units that play a role in the decision making process in cloning related issues. The Sub directorate General for Livestock Resources coordinates cloning and it has a technical approach to cloning as a breeding technology. The Sub directorate General for Animal Health watches animal welfare implications. Also, the Sub Directorate General for Sanitary Agreements and Border Control has a role in enforcement if restrictions to trade were to be implemented.

- Ministry of Health: AECOSAN (Spanish Consumption, Food Safety and Nutrition Agency) an independent agency ascribed to the Ministry of Health, whose constituents are consumers, is invited to weigh in food risk related aspects and pays particular attention to the placing on the market of food from animal clones.

Implementation of EU directives/ Country specific perspectives/country specific legislation

Domestic regulation applicable to GE plants also applies to GE animals. Spain has not specifically regulated GE animals or clones.

After an internal debate assessing the Commission's proposals, national authorities decided to continue to defend a science-based approach in the decision making process pertaining to cloning.

Spain's position in regards to cloning agrees with the Commission's proposals⁶. Spain's administration agrees on the absence of food safety issues, however, concerns about ethical and animal welfare implications still exist. The Government of Spain would rather limit cloning within the EU to endangered species, animal breed preservation and pharmaceutical applications.

Government officials support a pragmatic approach about placing food from animal clones on the market. While it would ban the import of clones, it will establish no restriction in regards to placing in the market food or animal products (semen and embryos) derived from clones and would also defend the lack of labeling and traceability requirements for offspring, as they are impossible to detect by analytical means.

In late 2016, the Commission released a [study](#) on the feasibility of labeling and tracing systems for products derived from cloned animals and their offspring.

b) INNOVATIVE BIOTECHNOLOGIES

Spain has not regulated the use of innovative biotechnologies in animals.

c) LABELING AND TRACEABILITY

Spain has implemented EU legislation on labeling and traceability. For more information on this topic, see the [Consolidated EU-28 Biotechnology Report](#).

d) INTELLECTUAL PROPERTY RIGHTS

⁶ A [proposal on the placing on the market of food from animal clones](#) and a [proposal on the cloning of animals of the bovine, porcine, ovine, caprine and equine species kept and reproduced for farming purposes](#).

Spain has implemented EU legislation. For more information on this topic, see the [Consolidated EU-28 Biotechnology Report](#).

e) INTERNATIONAL TREATIES/FORA

Spain's participation in international treaties and fora is no different from that of the EU. For more information on this topic, see the [Consolidated EU-28 Biotechnology Report](#).

f) RELATED ISSUES

Not available

Part F: Marketing

a) MARKET ACCEPTANCE

At the consumer level, cloning or GE animals are not widely discussed. The use of animals for medical research aimed at finding cures for diseases or the recovery of endangered species is generally regarded favorably.

EU wide and Member States specific perceptions about animal cloning can be found in the 2008 Eurobarometer Report “[Europeans’ attitudes towards animal cloning](#)”

b) PUBLIC/PRIVATE OPINIONS

Spain is a country with a robust livestock sector and is pragmatic regarding the use of new technologies in the field of agriculture and livestock production.

Similarly to the situation in other countries, while the technical experts understand the technology and defend a science-based approach, fears about public opinion still weigh heavy in the decision making process. Experts agree on the fact that cloning is not a food safety issue, however, animal welfare and ethical aspects raise concerns.

Spanish livestock breeders have showed a limited interest in cloning so far due to the high-implied costs. Additionally, while the preservation of positive productive traits through cloning is considered beneficial by livestock breeders, the erosion of biodiversity is considered as a blockage for this technology.

c) MARKET ACCEPTANCE AND MARKET STUDIES

There are not many country-specific studies on marketing or acceptance of cloning in Spain. However, the use of cloning for endangered species with particular focus in the Pyrenean Wild Goat has recently been published in the Conservation Biology Magazine: [*The Arguments against Cloning the Pyrenean Wild Goat*](#).

Related Reports

Report Title	Date Released
Legal Opinion on New Plant Breeding Techniques to be Published Soon	02/19/2016
19 European countries restrict the cultivation of GE crops	10/13/2015
Agriculture Biotechnology Annual 2015 – Spain	09/15/2015
Agriculture Biotechnology Annual 2015– EU-28	07/23/2015
Agriculture Biotechnology Annual 2014– EU-28	12/31/2014
Agriculture Biotechnology Annual 2014 – Spain	06/20/2014
Spain Continues Expansion of GE Corn Plantings	09/25/2013
Agriculture Biotechnology Annual 2013– EU-27	09/10/2013
Agriculture Biotechnology Annual 2013 – Spain	07/10/2013
MON810 Corn Area Hits New Record in the Iberian Peninsula	10/08/2012
MON810 Corn Area Reaches Record Level on the Iberian Peninsula	10/06/2011