Co-existence of GM maize in Spain

By Esteban Alcalde

SYNGENTA SEEDS S.A.
Balmes, 117
08008 BARCELONA
Spain

Co-existence of GM maize in Spain

The first GM maize hybrids were registered in the Commercial Variety Register in Spain on the 26th of March 1998. Since then, Spanish farmers have planted Bt maize on their farms. The experience of these five years has demonstrated that the maize production sector has been able to organize the simultaneous market availability of GM, conventional and organic maize. To provide a better understanding of how Co-existence of GM and non GM maize in Spain has been achieved, the following points will be addressed: the maize production and consumption in Spain; the nature of the genetic modification and the implications in farming and processing industry, and the points that can be drawn from the Spanish experience.

Maize production and consumption in Spain

In 2001/02, which could be considered a high-average year for the maize crop in Spain, 497,000 hectares of maize were planted. 417.000 were dedicated for use as grain and 80,000 Ha for silage. In the EU, Spain is the third largest grain maize producer behind France (1,18 million Ha) and Italy (1,15 million Ha). Spain accounted for about 11% of the total EU area planted and about 13% of EU production in 2001/02.

Table 1: Maize production base in Spain 2001-02 (Aprose data)

	Area planted('000 hectares)	Average grain yield (tons/ha)	Total production ('000 tons)
Grain Silage	417 80	10.21	4200

Within Spain, the largest concentrations of maize production are in the regions of Castilla y Leon and Aragon, followed by Extremadura, Castilla La Mancha and Andalucia (Figure 1)

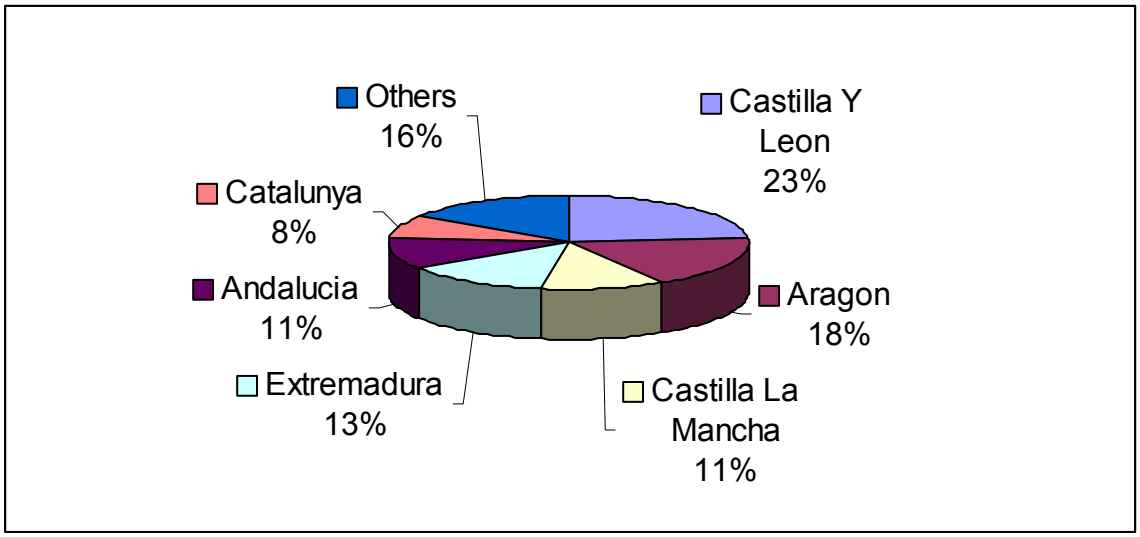

Figure 1: Location of Maize production in Spain 2001 by region (Source: MAPA)

In Spain, maize- producing regions are differentiated depending on whether the crop is irrigated. The vast majority of production (over 90%) is irrigated, with the balance being dry

land production. The largest of the dry land areas are in the Northern region of Galicia (66%), being the region of highest rainfall. It is self evident that yields on irrigated crops are higher (at 11.8 Tm./ha average in 2001/02) than those of dry land production (4.5 Tm./ha in 2001/02).

Traditionally, Spanish maize grain production has been insufficient to fulfil the demands from Spanish grain processors comprising of the animal feed , wet milling and dry milling industries. Thus, historically grain imports have been necessary to keep up with demand. Spain has a preferential agreement to import 2 million Tm. of maize from third countries[1], traditionally from the US and, more recently, from Argentina. France is also a key supplier for users near to the border

Table 2: Grain maize origin for Spanish users 2001-02 (Aprose/Cesfac data)

	('000 Tm.)
Spain	4.200
Argentina	1.500
France	1.500
TOTAL	7.200

In Spain, more than 80% of all the total maize availability (national production + imports), is used for animal feed. This percentage is likely to be higher when considering the destination of the national production. Most of the wet and dry milling industries are located near ports, using imported grain.

Table 3: Maize grain use in Spain (AGPME/Cesfac data)

	('000 Tm.)
Feed (on-farm use)	1.500
Animal feed industry	4.500
Wet milling	770
Dry milling	230
Human consumption	150
Others	50
TOTAL	7.200

The surface dedicated to organic maize is very small (< 1000 ha), despite the fact that organic farming in general comprises a significant sector in Spain, with 350.000 certified Ha. Spain ranks fourth in the EU in total area of organic crop production. The low level of organic maize production is probably due to the fact that most of the maize production is located on irrigated land where high inputs are required.

[1] U.S.-EU Enlargement Agreement

GM maize in Spain

In 1998 two Bt maize hybrids: Compa CB and Jordi CB were registered in the Commercial Variety Register . From that date until 2003, the only genetically modified variety available on the market in Spain has been the variety *Compa CB* (Bt 176) from Syngenta Seeds. In 2003, 5 new Bt hybrids from other companies [2]were registered [3].
Compa CB was first planted commercially in 1998 when sufficient seed to plant 20.000 hectares was sold. Since 1998, the area planted with Bt maize has remained at this level (20.000- 25.000 equal to 4%-5% of total Spanish maize plantings but a higher share in some regions, eg, 13% of plantings in Cataluña) because of a voluntary agreement from Syngenta Seeds to limit seed availability. Thus, currently whilst a quantity of Bt maize is commercially available to Spanish farmers, it is limited both in volume and to one of the varieties of late maturity maize. The main regions in which this limited volume of Bt maize seed has been planted, over the last 5 years in Spain are shown in Table 4. The highest concentration of use is in Cataluña, and in Aragón, corresponding to the areas most infested by the insect pests that Compa Cb controls

Table 4: Main regions growing Bt maize in Spain 1998-2002

Region	% Bt maize from the total maize surface
Andalucía	3%
Aragón	11%
Castilla-La Mancha	9%
Cataluña	13%
Extremadura	2%
Madrid	9%
Navarra	4%

Source: Syngenta Seeds, Spain

This highlights that the technology has been adopted by small farmers (predominant in Cataluña) and there does not appear to be any correlation between farm size and adoption rate. Farmer acceptance has been very good, as farmers have used all of the Bt seeds which Syngenta Seeds has offered for purchase each year.

From this data, it can be concluded that both the nature of the genetic modification (Bt) and the agronomic characteristics of the variety offered, namely late maturity, result in the absence of the GM maize in some of the more important maize production areas in Spain, such as Castilla y Leon. This can be attributed to the fact that the target pest is absent in these regions and/or the agronomic requirement to plant mid or early maturity varieties.

[2] Limagrain, Monsanto, Nickerson, Pioneer and Syngenta
[3] Orden APA/520/2003

GM market impact in Spain

Due to the nature of the genetic modification (insect resistance) and to the fact that harvested GM-grain is substantially equivalent to conventional grain, no special market channel for GM maize has been created. In terms of GM grain presence, the market segmentation operating in Spain could be classified as:

1. Conventional with or without GM.
2. Conventional, non GM
3. Organic

1. Conventional with or without GM

Most of the animal feed industry, which also uses imported G.M soybean in its feed compounds, has classified grain from Bt maize according to its intrinsic properties for feed use, and not distinguished it solely on the basis of its GM production method.. The huge demand for maize from the animal feed industry is greater than the entire national production. This, coupled with the geographical location of processing facilities (near to maize growing areas) has meant that all the GM grain production has been utilized by this industry.
All the farmers planting GM maize in Spain during their five years of experience have been able to sell their harvest at the same price range of commodity maize grain prices

2. Conventional, non-GM

Some feed and food manufacturers have preferred to source their supply from conventional non-GM grain with the aim of using this as a selling point for their products. This has been made possible through both national and import supply channels. From Spanish production, it has been made possible by not only the fact that some regions do not grow Bt maize, but also by existing farm management systems in regions such as Cataluña where Bt maize is grown. In this case , usually direct contracts between grain operators and farmers or cooperatives have been established prior to planting, following the existing standard procedures used for specialty grain maize (e..g maize for corn chips or snacks), which are already grown in these areas. The market grain price for these crops is usually comparable with commodity maize prices, but the farmer has the advantage of having a guaranteed buyer.
These practices, in general, have contributed to increased cooperation between farmers and the food and feed industry.
Food industries using maize (or soybean) have implemented procedures to assure the compliance of the labeling requirements related to GMOs. In addition to official inspections, independent surveys have been carried out by Consumer Associations (OCU) or consumer services from the distribution chains (eg. Consumer from Eroski group) where the presence of GM material has been checked for in hundreds of products offered on the market. Results of these surveys (available at www.ocu.org; www.revista.consumer.es;) show that for nearly 400 products, none of them were labeled incorrectly for the presence of GM material. These results confirm that such farm management and supply chain systems can secure the maintenance of non-GM channels in the Spanish market

3. Organic maize

During the five years of Bt cultivation in Spain, only 2 incidents have been recorded, in the Navarra region, related to the adventitious presence of traces of GM grain (below 1%) in organic produce. This point serves as an illustration that levels of adventitious presence with a threshold value of 1% are achievable in practice, while zero threshold levels are unattainable in farming systems

Conclusions

Co-existence between the different types of agriculture has been successfully achieved in Spain, demonstrated by its five years experience with Bt maize cultivation, This provides practical evidence that co-existence can work in normal farming systems without imposing strict EU legislation. However, a zero threshold is not compatible with the concept of co-existence between different types of farming, for any method of production.

The progressive introduction of GM varieties, restricted by the authorities to a limited number of varieties and the voluntary agreement of the Seed provider (Syngenta Seeds) to limit the seed availability, has created a model framework to provide the food and feed supply chain with GM, conventional and organic maize supply channels. Further refinements to agricultural practices may be required in the future to allow the market share of GM-crops to increase, while ensuring co-existence with other farming systems.

Crop production varies from region to region according to environmental and market conditions. Agricultural practices should be designed in such a way that they can be easily implemented according to individual conditions, are crop specific and adaptable to regional needs.

Only the establishment of practical and workable thresholds, complemented by good agricultural practices will allow the co-existence of all farming systems, thus maximizing the opportunities and choices for farmers in every region.