European Seed Association
*Speaking up for seeds!*



# *Learn more about Maize*

## *WHICH CROPS ARE COVERED ?*

This factsheet covers maize except sweetcorn and popcorn, which in ESA are addressed by the section for vegetables and ornamentals (SVO).

# *Key figures and estimated value on seed and fodder production*

With 148 million hectares **maize is the most important crop on global level**. The total estimated production is **more than 800 million tonnes**. After the USA and China the European Union is the third most important area of production with approximately 26 million hectares of production. In the EU the most important uses of maize are:

- Grain (9.5 million ha): 83% feed, 15 % starch, 2% semolina
- Silage (15 million ha): feed
- Biogas (1 million ha)
- Seed production (on average 150.000 – 200.000 ha)

While in the **USA** approximately **90%** of the maize are is covered by **GMO** hybrid varieties in the **EU28 only 2%** of the total maize area is GMO.

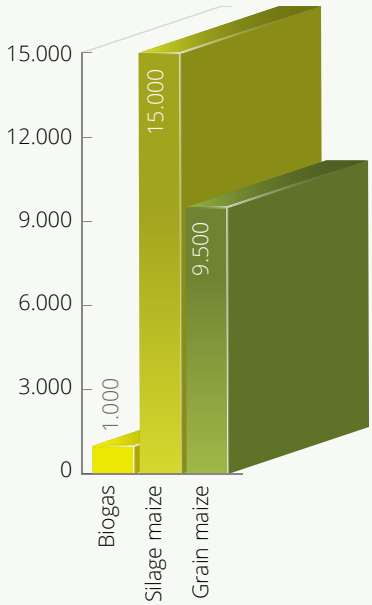
The **value** of the EU maize seed market is estimated at **1.6 billion Euro**.

Maize is covered by the Seed Marketing Directive for cereals: 1966_402. Sweet corn and popcorn are covered by the SMD for vegetables 2002_55.

The downstream products such as biogas, silage and grain produced from that seed amount to a total estimated value of **more than 32 billion euro**.

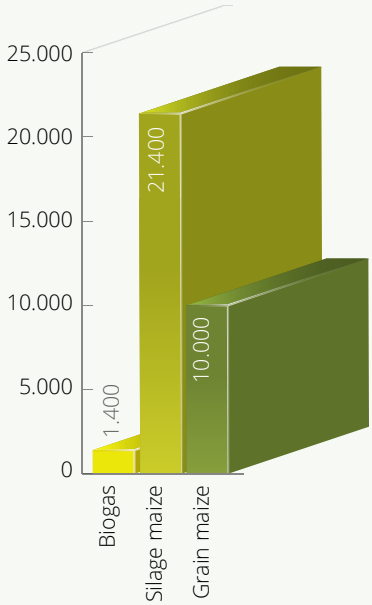
More than **200 types** of maize are grown globally, following **amazingly diverse plant cycles**, ranging from 60 to 70 days for the very early maturing type (Gaspée) and up to 10 or 11 months for late-maturing types grown in tropical regions. There are also **great differences in the height of the stalks**: from 30 to 40 cm plants, up to more than 10 metres in tropical regions, showing the wide diversity within the maize plant family.

**AREA OF PRODUCTION X 1.000 ha**




TOTAL: 25.5 MILLION ha

**TOTAL VALUE X MILLIONS €**




TOTAL: 32.8 BILLION €

# *Research and innovation*

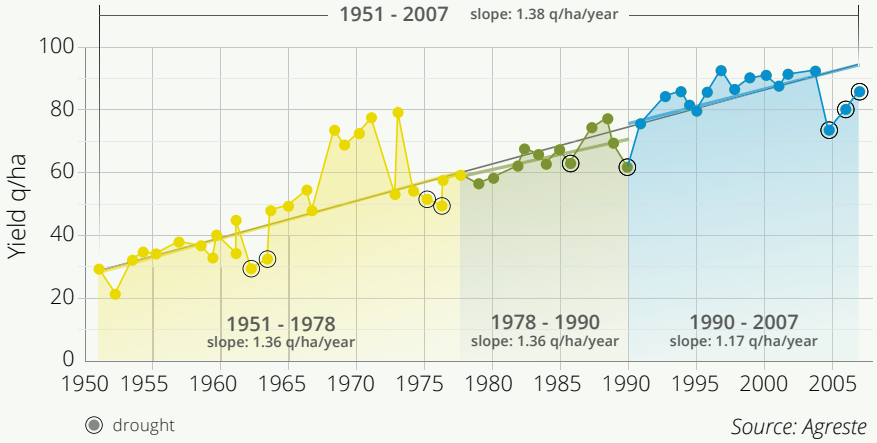
## Breeding goals and achievements

The most important breeding goal in maize remains yield improvement. For the different uses specific breeding programmes have been developed focusing on grain (grain yield), silage (digestibility) or biomass for bioenergy.

Genetic progress in hybrid maize has resulted in a significant yield increase in the past decades. The tables here on the right show examples of yield increase in France and Germany in the past decades. Since the 1950's maize plant breeding shifted from open pollinated varieties to hybrids.

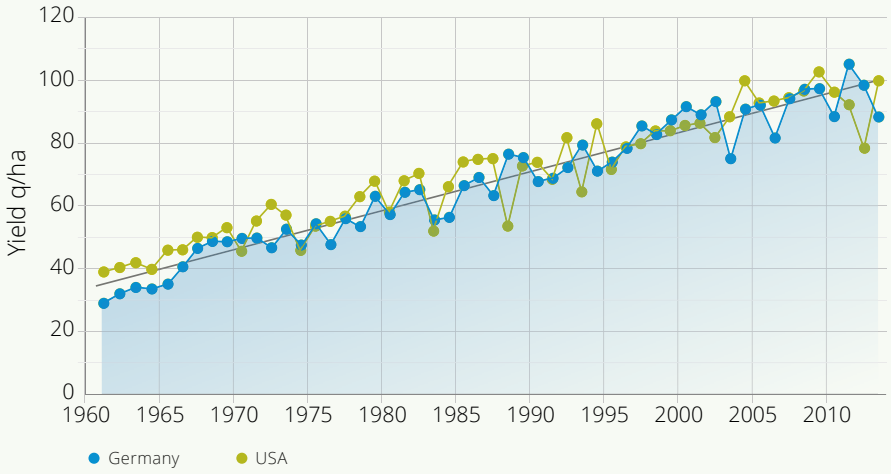
Additional targets in breeding are resistance or tolerance to abiotic stress factors such as lodging, drought resistance as well as disease and pest resistance.

**YIELD PROGRESS IN MAIZE (GRAIN) IN FRANCE BETWEEN 1951 - 2007**




*Source: Agreste*

**YIELD PROGRESS IN MAIZE IN GERMANY AND THE USA (FAO 2014)**




*Improvement in heat tolerance*

*Improvement in straw stiffness*

These two pictures demonstrate the genetic progress in these traits between open pollinated varieties (gelber Badischer landmais from 1955) and hybrid varieties (Grosso listed in 2010).

The development of parental lines is an essential activity in the breeding process of new improved maize hybrids. Different techniques in the area of biochemistry, tissue culture, cell biology, molecular biology and genomics are applied. In particular Marker Assisted Breeding is used more and more to select specific traits.

# *What is the Seed Industry in Europe?*

ESA has more than 30 national seed associations in 28 countries as members and more than 50 seed companies as direct ESA company members. In relation to Maize 23 Association members (indicated on the map with: AT, BE, etc.) are active involving more than 1.300 companies on national level in 20 countries.

ESA has 13 companies (indicated on the map with: 1, 2, etc.) as direct members of which 4 are family owned private companies, 4 cooperatives and 5 international companies listed on the stock exchange.

Click here or on the map below for further details on these associations and companies.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