Where seeds come from

A virtual tour of a Monsanto maize seed processing plant
Pursuing smarter ways to help nourish our world
Where seeds come from

We do this by developing technology-based solutions and agricultural products that improve efficiency and food quality. Our products and services are scale-neutral, enabling both small-holder and larger-scale farmers to produce more from their land while conserving precious natural resources for future generations.

The world’s population is growing steadily, but our natural resources – arable land and fresh water – are not. In order for agriculture to be sustainable, farmers need to be able to produce more and better food on existing land using less water and less energy. They also need crops that are more resilient against drought and other realities of a changing climate.

We do this by developing technology-based solutions and agricultural products that improve efficiency and food quality. Our products and services are scale-neutral, enabling both small-holder and larger-scale farmers to produce more from their land while conserving precious natural resources for future generations.

Monsanto is first and foremost a seed company that is committed to delivering sustainable agricultural solutions. Globally, our 24,000 employees in more than 70 countries partner with farmers, academics, governments and international organisations to come up with ways of producing more with less.

Monsanto has been focused entirely on improving agriculture since the 1990’s. We invest more than €3 million a day in research and development to create new tools to help farmers worldwide improve harvests and people’s lives. And we maintain a close link with our customers through more than 400 offices and production sites worldwide, including more than 80 locations employing more than 3,800 people in more than 40 countries in Europe.
What we do

Three main business areas in Europe

Agricultural Seeds

Breeding, growing and selling seeds for commodity crops, or row crops, is Monsanto’s main business in Europe. We produce a wide range of high-quality traditional maize and oilseed rape seeds for farmers, who in turn sell their harvests to food producers. Although Monsanto is a global leader in biotech crops, in Europe our seeds are almost entirely (99%) produced using conventional plant breeding and farming processes. In fact, more than half of our research and development spending globally, and virtually all of it in Europe, is devoted to conventional breeding and agronomic solutions. Collaborating with plant breeders and growers throughout Europe, we use modern science to accelerate the age-old process of breeding better plants by selecting the most desirable traits in existing plant populations and cross-breeding plants to create new, improved varieties. Monsanto maize and oilseed rape seeds are sold in Europe and exported to more than 30 countries under the DEKALB® brand.

For more information, please visit our websites:
www.monsanto.com/improvingagriculture/Pages/modern-breeding-techniques.aspx
www.monsanto.eu
www.dekalb.eu

Vegetable Seeds

We develop and produce a wide range of vegetable seeds, focusing on performance and consumer benefits, including great taste. Seminis® and DeRuiter® are our global vegetable seed brands.

Weed Control Products

We produce leading weed control products adapted to the needs of farmers, gardeners and other customers large and small. Roundup® agricultural herbicides and other products are used to sustainably and effectively control weeds on the farm as well as in private gardens.
Where seeds come from
Maize
Growing for Europe, helping Europe grow

Facts about maize:

• It is a high yielding cereal used in a wide variety of food, animal feed and biofuel applications.

• It is a valuable commodity in international trade.

• It is an ideal component in livestock feed, providing nutritious and highly palatable feed ingredients.

• It can contribute to stronger rural economies across grain and livestock sectors.

• When used in rotation with other crops such as wheat, oilseed rape and sunflowers and minimum or zero tillage techniques, it can contribute to reduced erosion and healthy soils\(^2\),\(^3\).

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2 www.monsanto.com/improvingagriculture/Pages/discussing-the-future-of-agriculture.aspx
3 www.fao.org/docrep/009/a0100e/a0100e02.htm
Maize uses and applications

Where seeds come from

Maize Seed Production

- Farmers
  - Food
  - Fuel
  - Fibre

Maize uses and applications

- Animal Feed
  - Distribution
  - Export
  - Consumption

- Dry Milling
  - Flour
  - Ethanol
  - Distribution
  - Export
  - Consumption

- Wet Grinding
  - Starch
  - Corn oil
  - Gluten for food
  - Gluten ingredient
  - Ethanol
  - Distribution
  - Export
  - Consumption

- Exports
  - Distribution
  - Export
  - Consumption
Monsanto maize seed processing in Europe

Active in Europe for more than 50 years, Monsanto is currently investing in expanded seed processing facilities in several countries in order to meet rising demand for our high-quality, high-performance seeds, particularly maize.

Here is an illustration of a typical modern European maize seed plant, which takes field maize from local growers and, using best-practice industrial processes and quality control, dries, sorts, and prepares seeds for the farmers who will plant the following year’s crop.

Except in the case of sweet corn, the crops resulting from our maize seeds in Europe are not intended for immediate consumption. They are the raw materials (grain) for food processing further along the food chain. We sell seeds to farmers; our farmer customers grow plants for silage or animal feed or sale to food producers.

When considering seed plant investments, Monsanto looks at:

- **Strategic location**
- **A country’s agro-industrial potential**
- **Projections for the future of the crop – in this case maize**
- **Overall investment climate**
- **Access to qualified employees**
### A modern seed plant at a glance

<table>
<thead>
<tr>
<th>Function</th>
<th>Conditioning seeds for grain production</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual production</strong></td>
<td>375,000 - 2 million bags for sowing</td>
</tr>
<tr>
<td><strong>Each bag</strong></td>
<td>50,000 or 80,000 kernels⁴</td>
</tr>
<tr>
<td><strong>Jobs⁵</strong></td>
<td>80-100 full-time 300-400 seasonal</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td>ISO 9001 – Quality OSHAS 18001 – Safety ISO14001 – Environment</td>
</tr>
<tr>
<td><strong>Direct benefits to the local economy</strong></td>
<td>Procurement of transportation and logistics services, hotels, restaurants, energy producers, maintenance, gardening, security (partial list)</td>
</tr>
</tbody>
</table>

1. Reception  
2. Husking and selection  
3. Drying  
4. Shelling  
5. Biomass boiler  
6. Storage  
7. Sorting  
8. Treatment  
9. Bagging  
10. Shipping  
11. Offices and canteen  
12. Main entrance

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⁴ 50,000 per bag in the European Union, 80,000 kernels per bag in certain eastern European markets  
⁵ Based on example of our newest European seed plant in Sinesi, Romania
Maize seed processing step-by-step

1 Reception
The processing begins with the arrival of trucks bringing “ears” of maize on the cob from local growers. The ears are unloaded onto conveyor belts.

2 Husking and selection
Ears go through special equipment to separate the husk from the seeds and maize cob at the center. Trained personnel supervise the selection process.
3 Drying
The dryers are the heart of the seed processing operation. Fresh maize typically has humidity levels between 25% and 35% when it arrives. During the drying stage, moist ears of maize enter high-powered drying chambers where warm, dry air blows around and through them for 70-80 hours. The process continues until the maize reaches a humidity level at which it can be conserved, about 12%. As part of its commitment to sustainability, Monsanto uses a local, renewable energy source – discarded corn cobs – to help power its dryers at many of its seed plants.

4 Shelling
In this process, mechanical shellers separate seeds from the cob while preserving the seeds' integrity. Seeds detach from the cob through friction.

5 Storage
In between shelling and sorting, seed is stored in silos. A typical silo can hold 140 metric tons of seed.
6 Sorting
Seeds are sorted according to shape, size, colour and density. Seeds that don’t meet Monsanto’s quality standards are discarded.

7 Treatment
The treatment process consists of coating the seeds with a product that protects them and colour-codes them according to their intended uses.

8 Bagging
Once seeds are sorted and treated, they go to the last stage of the process, where they are packed in bags and stored until they are shipped.

9 Shipping
Bags are put on pallets to be shipped to customers after a thorough quality control. Our maize seed in Europe is sold under the DEKLAB® brand.
Our commitments

At the heart of Monsanto is a very clear and principled code of conduct – one we expect all employees, contractors and management to live by every day. We operate under a genuine value system – our Pledge – that demonstrates integrity, respect, ethical behavior, perspective and honesty as a foundation for everything we do.

A key part of fulfilling the promise of our value system is by engaging our communities in a significant and positive manner. Not only do we work hard to support our farmer customers in a variety of ways, but we also:

• Provide extensive educational programs – particularly in science and agriculture – for students around the world.
• Fund numerous research grants for graduate students.
• Work in partnership with government bodies, non-profit agencies and advocacy groups to make agriculture more sustainable.

Monsanto as part of the community

We firmly believe in the responsibility to give back to the communities where we operate part of what they offer to us daily.

For example, in Ukraine Monsanto is investing €2.3 million in irrigation systems within the framework of a production programme implemented together with Ukrainian farmer partners. The project is underway in the Vinnytsya, Cherkasy, and Kyiv regions (“oblasts”) and is expanding to include other regions.

Under this project, Monsanto Ukraine purchases irrigation equipment for its partners and installs it in their fields. In 2012, we installed irrigation systems covering 210 hectares and began planning for a further 620 hectares.

The irrigation systems allow our partners to achieve more predictable yields even under extreme weather conditions such as drought. This, in turn, helps farmers minimize the risk of yield losses due to unfavourable weather conditions, thereby increasing incomes that benefit not just farmers but also their local communities.
To learn more about our business and our commitments, please visit: www.monsanto.com. Follow our business on Twitter® at www.twitter.com/MonsantoEurope, on YouTube.com/MonsantoEurope, on the Monsanto Europe-Africa blog, at www.monsantoblog.eu, or subscribe to our News Release RSS Feed.

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France
Hungary
Romania
Turkey

1 Headquarters for Europe & Middle East