



## Fact sheet: The socio-economic impact of New Breeding Techniques (NBTs) on the EU food supply chain

New plant breeding techniques (NBTs) allow plant breeders to produce plant varieties in a similar, but faster and more precise manner compared to conventional techniques. These can also bring new solutions for operators along the EU food supply chain, contributing to a response to many societal challenges. They enable farmers to achieve higher crop yields, whilst diminishing the environmental impact of production. NBTs also help food producers to increase the quality standards in their products, to the benefits of EU consumers.

### Impact on the plant breeding sector

NBTs help the plant breeding sector in many ways. Speed and accuracy are the most important advantages of the techniques. These enable plant breeders to aim for traits and crops that cannot be attained without NBTs, either due to technical or economic constraints.

Woody crops, such as pears, and vegetatively reproducing crops, such as strawberries, have long reproduction cycles. This means it can take many years to introduce new traits. For example, the normal reproduction cycle of commercial apples is about 50 years. With the use of NBTs, this can be reduced to 12 years, as these techniques diminish the number of backcrosses needed to breed out the undesired traits.

Furthermore, the European plant breeding sector is a world leader in terms of innovation. It accounts for nearly 50 percent of all global research on NBTs

(Lusser et al. 2012). This is due to the fact that plant breeding companies are highly research intensive and between 10 to 25 percent of their revenues are invested in R&D (Louwaars, 2009).

In 2012 alone the value of the EU seeds market was estimated at around EUR 8.6 billion, which accounts for 20 percent of the EUR 45 billion total worldwide turnover (ISF, 2013).

NBTs enable plant breeders to withstand the competition with foreign enterprises and research centres, and keep most of the innovation and the profitability in Europe.

#### Calculation of the potential impact of Research & Development (R&D) investment lost in the plant breeding sector

The EU seed industry earns **€8.6 billion a year**. With an average R&D investment level of 10% per year, the total R&D investment value is estimated at around **€860 million per year**.

A loss of 30% of the R&D in the EU would mean a **loss in investment in high level equipment and jobs amounting to €258 million**.





## Impact on farmers

NBTs help plant breeders to increase food production and resilience to climate change, while reducing the overall impact on the land.

By means of higher resistance and tolerance to environmental stress factors (e.g. droughts and floods), NBTs create crops with predictable yields and reduced risks of pre-harvest losses. This enables farmers to cut down the expenses and be more competitive in relation to imported products.

### Case study: Potatoes and the resistance for late blight. (Haverkort et al. 2008)

The *Phytophthora infestans* is a fungus that causes a severe potato disease known as late blight. Several fungicides are available to counter the disease, but these need to be sprayed on average 15 times a year.

Using cisgenesis to create a potato with sustainable resistance **saves 15 years of breeding** compared to conventional techniques.

The farmers' economic benefit of spraying less was estimated to be around **€900 million in the EU**.

This reduces fungicide pollution of groundwater and on the crops itself. Potentially, it also **lowers the product price** for all the other stakeholders in the food supply chain.

The environmental impact is crucial for farmers as they are subject to regulations on their environmental output levels. NBTs help farmers achieve higher yields while decreasing the use of

resources such as land, water, fertilizers, energy and chemical plant protection. This means that more food can be produced with a lower carbon footprint and reduced risks for public health.

## Impact on food producers

NBTs help food producers and retailers to aim for higher quality standards in their products by achieving a longer shelf life, slowing the natural process of rotting and reducing oxidative browning after processing or bruising during transport. This ultimately results in less food waste, a lower environmental impact and a reduction of cost for the consumers.

### Calculation on reduced food waste in EU

The EU Commission estimates that in Europe we waste around **90 million tonnes** of food every year. If nothing changes, this could rise to over 120 million tonnes by 2020.

All actors in the food chain are responsible; from those who produce and process food (farmers, food manufacturers and processors) to those who make food available for consumption (hospitality, retailers) and ultimately the consumer.

Avoiding only 10% of food waste (through improved shelf life, better production specifications and higher harvesting efficiency) would result in a reduction of 9 million tonnes of waste each year, representing a value of **€38 billion** and **36 million tonnes of CO2 equivalents** saved.







## Impact on consumers

NBTs help to improve food quality by enhancing healthy traits such as vitamin levels, and by reducing allergens and pesticides residues. NBTs also help in ameliorating organoleptic traits such as colour, odour, flavour and texture.

## Impact on food biodiversity

Apart from being an important source of innovation for the food supply chain, NBTs are essential to maintain and improve biodiversity. This is because the higher speed in breeding and lower cost of the plant breeding process provides the opportunity to design crops with traits that would have been very difficult to achieve with conventional methods.

### About the NBT Platform

The NBT Platform is a coalition of SMEs, large industry and prominent academic and research institutes which strives to bring clarity to the European debate on NBTs. Its aim is to provide policy makers and stakeholders with clear and precise information on NBTs and to generate awareness about their widespread benefits for the European economy and society as a whole.

More information on [www.nbtplatform.org](http://www.nbtplatform.org), or contact us via [info@nbtplatform.org](mailto:info@nbtplatform.org)

