European Seed Association
Speaking up for seeds!

Learn more about Potatoes

WHICH CROPS ARE COVERED ?

Potato is the **fourth most important food crop in the world** after corn, rice and wheat. Potatoes are grown throughout the world and present a **global production of more than 300 million tons** fresh tubers from around 20 million hectares (ha). Asia and Europe are the world's major potato producing regions, accounting for more than 80% of world production.

The main potato markets are export and French fries. Next to the traditional use as table potatoes and starch several niche markets have been developed in the past decade as organic, bakers, fast food, crisps, prepack, precooked and salads. The **export of (seed) potatoes and potato products from the EU** to other parts of the world plays an important role contrary to the situation in many other agricultural crops.

The ESA Section for Potatoes (SPO) addresses potatoes as regulated by the Seed Marketing Directive for potatoes: 2002_56.

Key figures and estimated value of (seed) potatoes and the potato processing chain

*Potatoes are grown on approximately **1.6 million ha** in the EU producing **60 million tonnes** potatoes at farm gate. The total value of the seed potatoes produced in the EU is estimated at **1 billion Euro**. The value of the harvested crop depends on the year. The value of the processed potatoes is estimated to be more than **600 billion Euro**.*

source: EUPPA 2011

Research and innovation

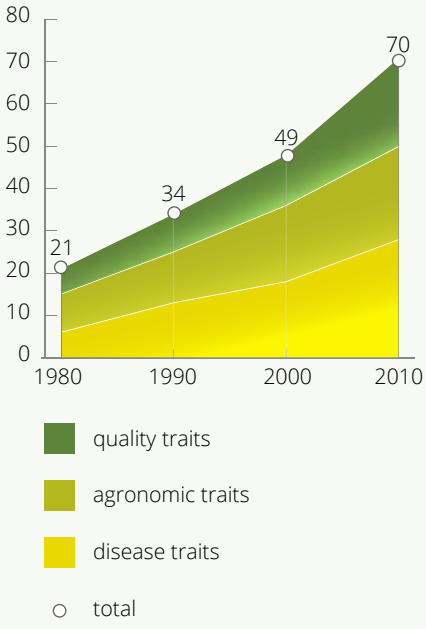
Potato (Solanum tuberosum ssp. tuberosum) is a tetraploid crop which is propagated by tubers.

Starting point for breeding is genetic recombination by sexual (bi-parental) crosses which produce "True potato seed" (botanical seed). Because of flower biology (male sterility, incompatibilitie, etc.) not all desirable combinations may be realised by breeders. As a result of the tetraploid structure, significant inputs from interspecific hybridisations and high heterozygote structure, every single progeny has a single (unique) genetic structure which is fixed in subsequent seed tuber generations used for screening. Recessive genes are very difficult to use.

The low multiplication rate, seed physiology (aging, tuber size), numerous pathogens, seed weight and quarantine barriers make evaluations of the traits (phenotyping) and market introduction of new varieties rather difficult and slow, compared to diploid grain crops like maize and wheat. Also, sexual recombination cycles are rather long which result in slow speed for introgression of desirable genes. But, as compensation, shelf life of a successful cultivar is also much longer and genetic diversity is well preserved and enlarged.

Due to the increased market segmentation the complexity and investment in plant breeding in potatoes has tripled in the past 30 years.

NUMBER OF TRAITS BEING SELECTED UPON IN POTATO BREEDING



Source: ESA

Achievements in plant breeding

» For the processing industry: 15 years ago the processing industry produced 450 grams of French fries out of 1 kg potato. Potato plant breeders were able to improve the recovery rate from 450 grams / kg to 550 grams / kg nowadays.

» For to the potato grower: nematodes are an important limiting factor for potato production. Potato plant breeders have been able to develop new varieties resistant to nematodes which enables the growing of potatoes also on less suitable soils.

» For biodiversity: The 33rd complete edition of the Common Catalogue contains more than 1500 potato varieties. Each year new varieties are added developed by potato plant breeders, demonstrating that plant breeding contributes to biodiversity.

What is the Seed Industry in Europe?

Concentration of private potato breeding programs in Europe

Most of the existing potato breeding programs in the world are situated in the European Union (83%) and in South America (10%). Of the estimated 249 programs 157 are carried out by commercial breeding companies (63%) and 92 are conducted by universities or institutes (37%). From the 157 private companies active in potato breeding 150 are situated in the European Union (96%). The vast majority of these private potato breeding companies fall in the category micro enterprise (Less than 2 million Euro turnover and 10 employees).

The concentration of private breeding activities in Europe is due to historical and climatological reasons. The moderate conditions in the North-Western part of Europe are in particular suitable for the production of (seed) potatoes of good quality. In addition the possibilities for protection of new potato varieties by Plant Breeders Rights (both nationally and on community level) have played an important role in the establishment and further development of potato plant breeding in this part of the world.

Overview of the existing potato breeding programmes in the world

Continent	Nr of countries	Nr of breeding programs		
		Private	Institutes	Total
Europe (EU28)	28	150	21	171
Eastern Europe	3	0	4	4
North America	2	2	12	14
South America	7	4	20	24
Africa	1	0	1	1
Asia	4	0	33	33
Oceania	2	1	1	2
Total	**47**	**157**	**92**	**249**

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 seed potatoes 19 Association members (indicated on the map with: AT, BE, etc.) are active, involving more than 450 companies on national level.

ESA has 9 companies (indicated on the map with: 1, 2, etc.) as direct members of which 7 are private companies which are partly family owned, 1 is a cooperative and 1 an international company listed on the stock exchange.

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

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