



Learn more about Forage and Grasses

WHICH CROPS ARE COVERED ?

With more than 10.000 domesticated and wild species **Grasses** (Poaceae or Gramineae) represent the **fifth-largest plant family**.

Fodder Legumes (Leguminosae or Fabaceae) is the **third-largest plant family group** of more than 18.000 different species.



Grasses are used for fodder purposes (pastures and meadows), leisure (lawns, sport fields and golf courses) and landscaping. Fodder legumes and fodder brassica's are mainly used for fodder purposes.

Key figures and estimated value on seed and fodder production

*In the EU there are approximately **72 million hectares** of grassland (63 million hectares of permanent grass land and 9 million hectares of temporary grassland).*

*Grass production per year is estimated **between 2 tonnes / ha and 10 tonnes / ha**.*

*The total value of grass production in the EU is estimated to be **more than 23 billion Euro** in comparison to an estimated value for wheat of 24 billion Euro or maize of 8 billion.*

*In the EU seeds of grasses and fodder crops are produced on approximately **280.000 – 300.000 hectares** yielding between **250.000 and 325.000 tonnes of seed**.*

This factsheet covers the species regulated by the EU Seed Marketing Directive for Fodder plants (1966/401/EEC) regulating around 30 different grass species, 20 different fodder legume species including alfalfa and different clover species as well as fodder brassica's.



Environmental benefits

Grass seed trade dates back at least 300 years. European agricultural grassland varies from low-yielding, hill and mountain-grazing land unchanged for centuries to intensively managed, high-producing pasture and arable meadows.

Reseed is Carbon neutral

Regular reseedling is essential. Modern forage varieties are used for pasture renewal and provide benefits:

- » High quality pasture produces **more milk/meat per hectare** relative to the environmental footprint, while high production from grassland also means **less reliance on bought animal feed, with all the production, transport and environmental costs.**
- » Most grassland gets a large proportion of the **Nitrogen fertiliser it needs from the legumes growing together with the grasses.** This is more beneficial to the environment than transporting and spreading manufactured Nitrogen.

- » When grassland is part of **rotational farming it improves organic matter content, general fertility and reduces the risks of erosion.**
- » Grassland in general **provides biodiversity, insects and birdlife at the same time as yielding the dairy and meat products for public consumption.** In addition, both lowland and upland grass farming together with the animals they support make a **major contribution to the scenic countryside we all enjoy.**
- » Humanity's need for green space is seen in parkland in and around large towns and cities and of course domestic lawns. **All of these are sown and maintained with grass seed.**

Golf courses, football pitches, racecourses, tennis courts etc. all use grass seed for their establishment and upkeep. The grass seed used is **specifically chosen for this purpose** and is the **result of decades of work by plant breeders searching for improvements.**



Research and innovation

Formal breeding of cool-season grasses and legumes began simultaneously in the late nineteenth century in Great-Britain, the USA and Denmark. Later on, in the twentieth century, important breeding programs were started in many other countries.

Most cool-season grasses and fodder legumes are perennial, open-pollinated allogamous species. Due to their out-crossing character, high genetic variation exists in all natural populations, which has been the starting point of much, early breeding work.

The earliest cultivars were mainly classified according to their maturity and use: tall growing, early flowering hay types and shorter growing, late flowering pasture types.

What do breeding experts look for?

- 1) **Relative maturity**, measured as heading date (probably historically the most applied selection criterion in grasses).
- 2) **Forage yield** for the different cuts during the year and over 2, 3 or more years.
- 3) **Biotic stresses**: disease, pest and nematode resistance. For grasses, different *rust* types are the most frequent diseases.
- 4) **Abiotic stresses**: resistance against cold, heat, and drought.
- 5) **Nutritional value**: digestibility, crude protein content, feeding value.

Best practices

Spaced plantings of seed propagated germplasm provided the basis of most initial cultivar development by mostly visual selection of individual plants on desired traits: growth habit, flowering date, sustained vigour over several years (persistence), disease resistance and uniformity.

This is called phenotypic selection and can be done in one or more cycles according to the genetic progress made for each trait in order to increase the favourable characteristics in superior genotypes.

The superior individuals selected are cross pollinated in an isolated situation: polycross blocks (see picture) in which plants are harvested individually and their progeny tested in micro plots.

Ultimately, after several cycles which can last 2-3 years each, the top individuals (or progenies) are chosen as constituents of a so called synthetic cultivar.



Production of grass selections in isolation

Seed Industry achievements

- 1) **The genetic improvement of forage crops appears to be progressing more slowly than for grain crops due to the greater complexity:**

It is estimated that on average the gain has been of 4% in harvested total dry matter yield / decade.

- 2) **Seasonal yield distribution is of major importance and related to animal requirements:**

For instance, a lack of winter, early spring or mid-summer growth can have a major impact on livestock stocking rates and breeders have put a lot of effort in the adaption of their cultivars to the seasonal conditions for growth to match animal needs.

- 3) **Stress tolerance:**



There have been notable achievements in breeding forages for stressed environments, such as winter hardiness, drought tolerance, pest and disease pressure and grazing tolerance.



- 4) **Forage nutritional value:**

Assessments of animal production are limited due to the high costs of animal trials. However, improving criteria of nutritional value can have a major effect on animal output (milk, meat). A 1% increase in digestibility can lead to a 5% increase in animal output and an important effort has been made on this criterion in many breeding programs.



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 Fodder crops and Grasses 24 Association members (indicated on the map with: , , etc.) are active involving close to 1000 companies on national level.

ESA has 8 companies (indicated on the map with: , , etc.) as direct members of which 6 are family owned private companies, 1 cooperative and 1 private company with more than 800 farmer owners.

[Click here](#) or on the map below for further details on these associations and companies.

