

# Sowing the seeds for

**What does it take for new grass seed to reach the stage where it is ready to be launched on to market place? Gerard Van 'tKlooster, pictured right, reports.**



The development of a new grass variety takes 15 years and can take the breeder around the world in the search for the perfect species for certain conditions.

In breeding groups of plants of the same species are used in order to achieve as great an amount of variation as possible – variation is the most important element in breeding.

Plants living in natural conditions are affected by a large number of stress factors such as climate and environment. The origin for the genus *Lolium* has not been precisely pinpointed. It is thought to have come from the Mediterranean but another possibility is that it came to the UK from West Asia.

*Lolium perenne* (Perennial ryegrass) is an especially important species in developing lawn grasses and knowledge about the best possible growing area for individual species and biotypes, as well as the borders within which these grasses occur, provides the breeder with information for targeted breeding.

It is up to the breeder to

achieve the best combination in the new varieties and you can find grass species growing naturally all over the world.

The most important species in breeding cool season grasses like perennial ryegrass (*Lolium perenne*), smooth stalked meadowgrass (*Poa pratensis*), fine fescue (*Festuca rubra* spp) and Bent grass (*Agrostis*) it is ideal to learn more about, and collect, the good plants with a winter hardiness found in Scandinavia and Eastern Europe.

Likewise those with a good drought tolerance which are found in Italy and France or good wear tolerance which are found on paths etc.

The collection of plants occurs at one spot where between 30 and 50 ecotypes of a species are collected to ensure that all possible combinations and specialities from that site. This is the initial selection. The big difference between this and collecting for a gene bank is that gene bank offi-

cialists like to collect all the genes from a site while the breeder looks for specific genes.

The entire plant is considered and not just its seed production – the speed of growth, the amount of tillers on a plant and the speed of spread are all important.

Once at the nursery of the breeding station the various types are selected and divided into three plants and a clone is planted out in the greenhouse. This constitutes the second selection. In the early spring we select the fast growers from the greenhouse and plant outside. The plants are harvested in groups of half-sibling families – mother is known, father is not – or as total populations. This decision depends on such factors as the amount of seed and the breeding schedule.

The next year the seed comes up for variety testing and is assessed as half-sibling family. After undergoing one or two years of variety testing in turf tri-

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# the grass of tomorrow



als, a selection is made and the best plants of one group are placed with the best group of another in turf plots around a foot square in size. In every trial there are some control varieties and there are three plots of every sample. The

same tests are carried out in the Netherlands, Germany and France whenever possible.

In these turf tests the breeder gets data for shoot density, wear tolerance, winter hardiness, spring performance and the gen-

eral turf impression. By making comparisons from the trials it is possible to decide upon the best sample for different climates or on which samples are best on all trial sites.

After these have been selected we bring the best together in a new isolation. This is to prevent pollen from other samples corrupting these elite samples. We use rye for isolations as during the flowering period of May and June it is two metres tall, much higher than the grass culms and it therefore acts as a barrier for the pollen and prevents it from blowing about.

The best populations are harvested that year and the seed will be used on more trial sites in bigger plots. By now the elite populations have proved that they are better than the control varieties which are existing varieties. For a seed company the new variety must be better than the best variety the company already has.

Seed yield is also very important and this is also tested on the new varieties while disease resistance is another important consideration.

For some diseases – brown patch, Pythium, Dollar Spot – there are laboratory tests or for others – Crownrust – there are greenhouse tests but the best way to find out the disease resistance

is from the data of the trials. The only problem then is that the breeder never knows when a disease will strike. Therefore you need more trial sites. There is the same problem testing for winter hardiness but you can solve it by a trial in a mountain area.

For specialised uses we use a machine that “plays football” for sports fields and when golf use is the main goal we use a green mower and cut back to four or five millimetres. This is even possible for some strains of perennial ryegrass and looking into the future we see a place for perennial ryegrass on the golf course.

In the USA and Germany it is already quite normal to use perennial in the mixtures but in the United Kingdom we are afraid to use the words perennial ryegrass. People there think of the S-23 types of perennial ryegrass and forget that there have been real amenity types of this species in existence for 25 years now – see the STRI Turf Grass Seed List. Some of the better varieties can exist under close mowing, therefore are suitable for fairways, tees and even the greens. Perennial ryegrass is excellent for overseeding so it can rival annual meadowgrass.

What about a good equal green with perennial against a patchy green with bent and *Poa annua*? It would be nice to use the best grass but not just because our father and our father's father used it but because under the circumstances the species is the best.

After three years of testing the breeder can make a decision. If a new variety is better than the existing variety the first multiplication can start up – a planted multiplication for a small harvest of about 30-70kg of seed. Part of this will be used for the next generation of the variety, a part for applications in the different countries of interest and a part for storage. In a controlled storage room the seed can be stored for 15-25 years. From planting to harvesting of the variety it takes 16 months.

The official application takes two to six years and in that time the multiplication to certified seed takes place.

■ Gerard Van 't Klooster is Head of Breeding for Barenbrug in Holland.

