

# BarForage NEWS

ISSUE 12 • Autumn 2019

## **New for 2020**

*Callan and Barclamp*

## **Breeding Grasses of the Future**

*New grass breeder at Loughgall*

## **East Vs. West**

*We catch up with our Scottish  
Grass into Gold Farmers*

 **BARENBRUG**



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***We've been a leading UK grass seed breeder and grass expert since 1904***



# Welcome

## Issue 12 Autumn 2019

### by Piet Arts, Global Research Director

**We live in a world that is changing fast and it also affects agriculture. Although fewer and fewer people are active in farming, more and more people have an opinion about agriculture. Consumers' wishes and public opinion has forced agriculture to become 'greener' and more sustainable with lower input. That has an influence on the traits that are important in grass varieties.**

At the same time, farmers still need varieties with classic traits like high yields and good quality that persist for a large number of years in their pastures. Barenbrug plant breeders are therefore incorporating more and more technologies and testing procedures to combine the classic traits with new sustainability demands. Climate change forces us to look ahead and breed material or select species that can cope with a changing environment, like longer periods of drought and

winters that become milder.

With its global presence and through working with numerous partners, Barenbrug has access to a wide range of germplasm to continuously improve varieties and offer the best possible product for each market. With a widespread global testing network, thousands and thousands of research plots are harvested annually to find the best variety for a particular area.

The Royal Barenbrug Group is committed to thinking global and acting local. Throughout this issue of the BarForage news you will read more about our global activities, meet our latest UK breeder and hear about many exciting new UK varieties that have come through the 15 year development process and will be available over the next few years.

**Image above: Piet Arts with Dr Gillian Young of AFBI.**

## Meet the Team

The agriculture team at Barenbrug has a busy few months ahead with an industry event to attend every couple of weeks.

If you are planning to visit any of the shows on the right, please stop by our stand to say hello!

South West Dairy  
2nd October 2019

Borderway Agri Expo  
1st November 2019

Agriscot  
20th November 2019

Winter Fair  
12th December 2019

# Barenbrug Global Research

By Piet Arts, Global Research Director

The Royal Barenbrug Group is a family owned grass breeding company currently in the hands of the 4th generation of the Barenbrug family. From small beginnings with Joseph Barenbrug in the Netherlands in 1904, we now conduct our research and development in 22 different locations in all major agricultural areas of the world with multiple research stations in European, Russia, the USA, Brazil, Argentina and Chile, South Africa, Australia and New Zealand. That gives a lot of opportunities for breeding and selection.

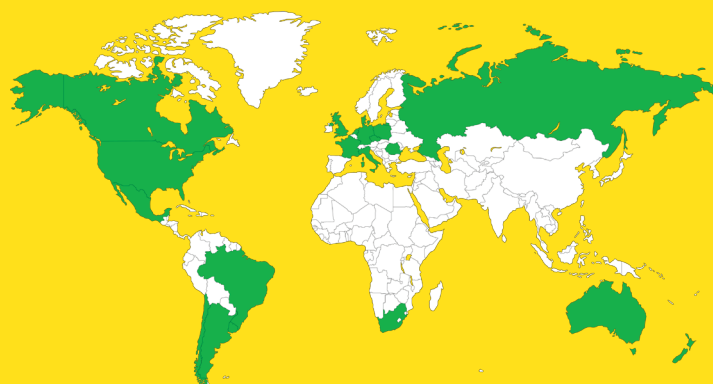
In our Perennial Ryegrass (PRG) trials in the UK and Ireland, we test new experimental varieties and selections, not only from our long term partner AFBI (from Northern Ireland), but also from our successful PRG breeding programs in the Netherlands, France and New Zealand. This will lead to finding varieties with wider adaptation and therefore 'climate resilience'. In present Recommended List trials in the UK and Ireland we have entered material developed in New Zealand, that shows very good yield and develops early after winter in order to extend the grazing season. Before applying this material in RL trials, it is tested on the European continent to ensure the combination of yield with disease resistance.

To meet future needs for sustainable use we have developed selection systems that can quickly separate the wheat from the chaff. For example, above is a picture of PRG plants on a hydroponic system in which the amount

of Nitrogen is limited. This allows selection of individual plants in a very well controlled system. These plants will be used in future varieties that will be able to yield in an environment with much lower nitrogen input.

Herbage quality is an important trait that requires a lot of effort in a breeding program. Many samples are analysed every year, and only the better varieties are advanced in the breeding program. Quality is important everywhere and a nice example of how quality is tested elsewhere comes from Brazil. In Brazilian agriculture in the tropics, beef production is the main activity. The species used is called Brachiaria and quality declines quickly in its warm environment. To have the most reliable results in Recommended List trials, quality is measured as Live Weight Gain (LWG) with beef cattle in a pasture environment. Each variety is sown in 2ha paddock, and stocking rate is adjusted to the growth of the grass.

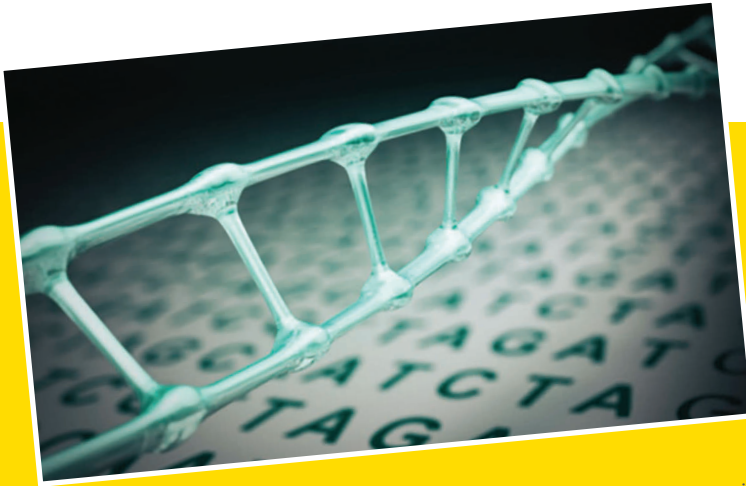
After two years of trials, weighing the animals every month, both the dry matter yield of a pasture and the LWG per animal/day are determined. As is shown in the graphs overleaf, varieties have considerable differences in yield (left), with also differences in LWG (right).



The varieties with the highest dry matter production (154 and 156) also have the highest LWG, and thus a much better financial result/ha for the farmer.

Besides improving traits like quality in a 'conventional' way

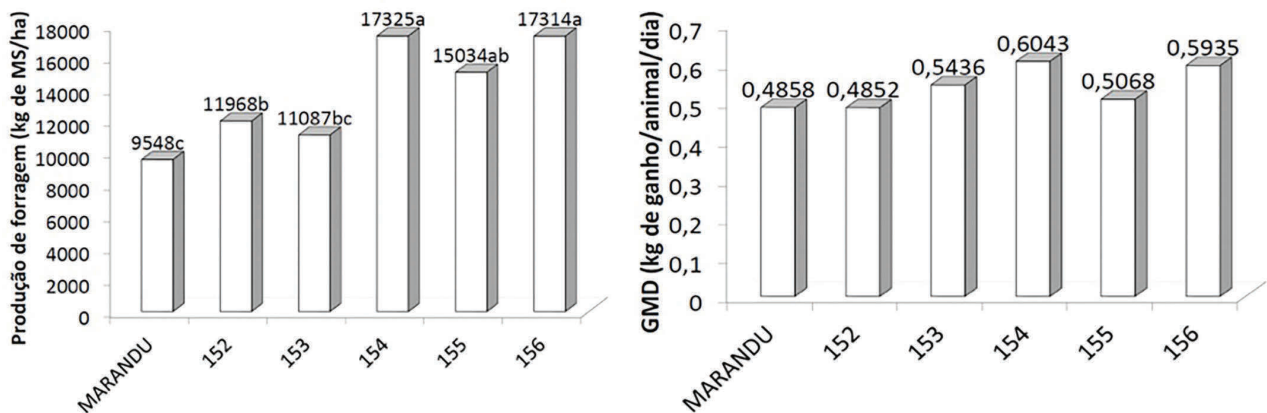
**Image above: The countries of the world where The Royal Barenbrug Group conducts breeding and/or research.**



(crossing and selection), Barenbrug is also involved in projects where the most modern cutting edge technologies are used, like gene-editing and genomic selection. The research is ongoing, but we expect that gene-editing can lead to significant improvement of herbage quality which also comes with a reduction in methane emission. With the ruling of the European Court of Justice, products generated through gene-editing will not get access to the European market for the time being. This is unfortunate, since important improvements will thus be withheld from European farmers.

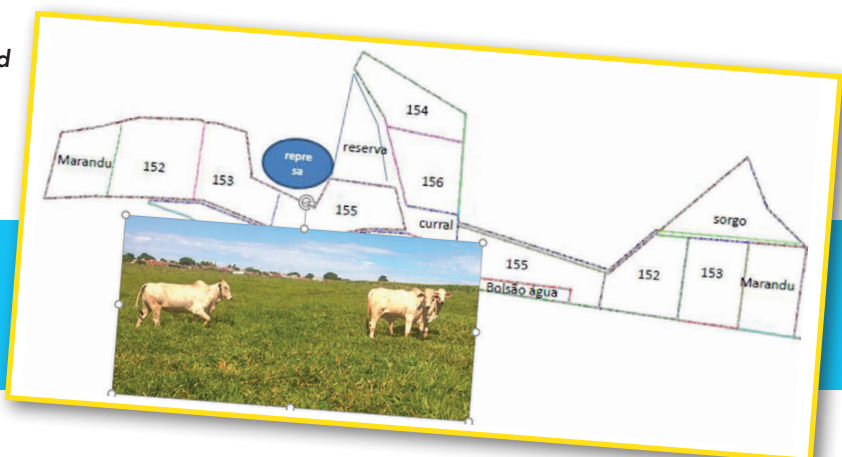
Genomic selection is used in our programs in the Netherlands and New Zealand for prediction of (seasonal) yield and other agronomic traits. The principle is the same as in Dairy cattle breeding with each individual plant getting a breeding value, based on a prediction model. A number of plants with the best possible breeding values are put together to make a new variety. That still doesn't guarantee that is the best variety, so the new Genomic Selection varieties still have to be evaluated in field trials in each specific environment.

Last but not least is the development of Perennial Ryegrass hybrids - not to be confused with hybrid ryegrass which is a cross between two species; Perennial and Italian Ryegrass. In this case we are crossing two perennial ryegrass parents, which when crossed together give a much higher yield than the traditional varieties. This is still a very experimental program, but nevertheless very promising. The first hybrids have been tested in New Zealand, next year to be followed by the first European hybrids.



Graph above: This graph shows how the varieties have considerable differences in yield (left), with also differences in LWG (right).

## Brazilian Variety Trials





# New for 2020

## Callan

The newest late diploid perennial ryegrass from the British breeding programme at AFBI Northern Ireland is Callan. This variety was first entered onto the Recommended Grass and Clover List for England and Wales in 2018 and first harvest from a 100% UK crop was 2019.

The latest RGCL shows Callan to be an excellent all round performing variety with a heading date of June 1st. Under grazing, it has the highest yields of all the late diploid varieties under early spring and spring grazing with 114% and 108% yield, total grazing yields of 103% and a summer grazing quality of 76.2 D. Under silage management, a strong first cut of 103% and a third year total yield of 105% makes Callan an

excellent addition for any perennial based sward.

In Scotland, the SRUC Recommended Grass and Clover list paints another strong picture with 104% for both mean cutting and total grazing yields. A first cut of 111% is second only to Tyrella, another stalwart variety from the AFBI programme and the early spring growth of 125% is 8% more than current group leader, again Tyrella. Callan, which has an REE of 46, also has good quality data in Scotland with a first cut of 70D, 2nd cut of 72.7D and a grazing figure of 75.1D.

Callan, one of whose parents is Tyrella, is also highly likely to feature in the recommended list for Republic of Ireland for 2020.

## Barclamp

Barclamp is a new diploid hybrid ryegrass which was bred in Barenbrug's Dutch breeding programme by Marcel Van Nes and is one of only 3 diploid hybrid ryegrasses recommended in the E&W RGCL. Two of those varieties are Barenbrug bred with Barclamp joining Barsilo, a variety that has featured since 1998.

Barclamp was officially listed in the UK in 2017 with a heading date of 25th May, one of the latest available. With an early spring growth of 112% and the highest first cut of the group which is also excellent quality at 72.1D, Barclamp offers real value to medium term mixtures. As well as yield and quality, Barclamp has excellent agronomic characteristics with the highest ground cover across all of the year, excellent winter

hardiness and the best all round disease profile including a crown rust resistance of 7.4.

In Scotland, Barclamp is the first ever Barenbrug bred hybrid ryegrass to join the small group of only 8 first choice varieties. Barclamp is the latest heading in the group with an REE of 39, which is 5 days later than the next latest variety. Barclamp offers the highest early grazing option (1.4t DM/ha) of the hybrids following with a main cut of 5.5tDM/ha and a second cut of 3.4tDM/ha. Hybrids, having the Italian genetics, tend to be lower in D value than perennials unless cut more frequently but Barclamp has a respectable 68.5D value for first cut. Ground cover is rated A.



# The Grass Variety Pipeline

**Grass breeding is currently quite a long process which takes somewhere between 15 and 17 years from the initial crosses until there is commercial seed available to sell.**

Every year Barenbrug and AFBI select the best of the breeding material which has already been through 8-10 years of testing and trialling to be submitted into independent National List testing for a further 4 years. At present we have 31 varieties in that official testing system and know the material that will be sown as far ahead as 2021. The latest varieties will have official decisions made on them in 2026 and then commercial seed will be available for sale in 2028. The future of grass is already here. Our current portfolio includes a number of highly successful varieties such as Fintona, the highest yielding perennial ryegrass ever bred in the UK, Seagoe, Moira Glenariff, Glenarm, Tyrella and Dunloy, all from the UK breeding programme.

Close to market we have two very promising new diploid varieties; intermediate Galgorm and late Dundrod, which were added to the recommended lists in spring of 2018 and 2019 respectively and likely to be available for purchase in 2021 and 2022 and found on both England & Wales and the Scottish recommended lists. The early perennial ryegrass Glasker will be on the market in 2022 as well but only available for England and Wales. Late tetraploid Killylea will be produced for Scotland only, and will be available in 2023. All the perennial ryegrass varieties discussed above have come from the Agri Food and Biosciences Breeding programme in Northern Ireland. We are proud to have such an extensive portfolio of British bred grass varieties.

For the short term grass rotations we have Barimax, a new French bred tetraploid Italian listed on both the Scottish and England & Wales recommended lists and coming in 2021. Also in 2021, we will have Bannfoot, a 7/8 perennial hybrid ryegrass from AFBI listed in England and Wales which will be incredibly useful in medium term rotations giving very persistent forage but still with a yield advantage over pure perennial varieties.

Looking to decisions which will be taken early in 2020, two very exciting perennial ryegrass varieties are coming through; Ballyvoy a diploid and Gracehill a tetraploid. Further away from market we have the following 34 varieties in the independent testing process which will provide a continuum of new varieties for the next decade:

Early perennial ryegrass	1
Intermediate Perennial ryegrass	13
Late Perennial Ryegrass	15
Hybrid Ryegrass	3
Italian Ryegrass	2



## The Initial Crossing

*The first stage in producing a new variety.*



# Breeding Grasses of the Future



## New Grass Breeder Takes the Reins at Loughgall

**A new face is now in charge at the AFBI perennial grass breeding programme at Loughgall. Dr Gillian Young takes over the programme from David Johnston, who retired in July 2018.**

Gillian joined the grass breeding programme in 2016, working alongside David since then on what is a highly successful and productive programme at Loughgall. The programme, supported by the Department of Agriculture, Environment and Rural Affairs, Northern Ireland, and Barenbrug, has produced over 40 new varieties for the Barenbrug catalogue, and has many more exciting and high quality additions in the pipeline to come.

Gillian started out her career as a plant pathologist and was appointed to the post of Senior Scientific Officer at AFBI in 2009. During her tenure as plant pathologist she had the opportunity to work with the now retired AFBI potato breeder Paul Watts, before being appointed as AFBI grass breeder in 2016. "Becoming a grass breeder was a really exciting

opportunity," says Gillian, "And I relish the opportunity to produce innovative new varieties that can contribute to a

better and more sustainable future for farmers across the UK".

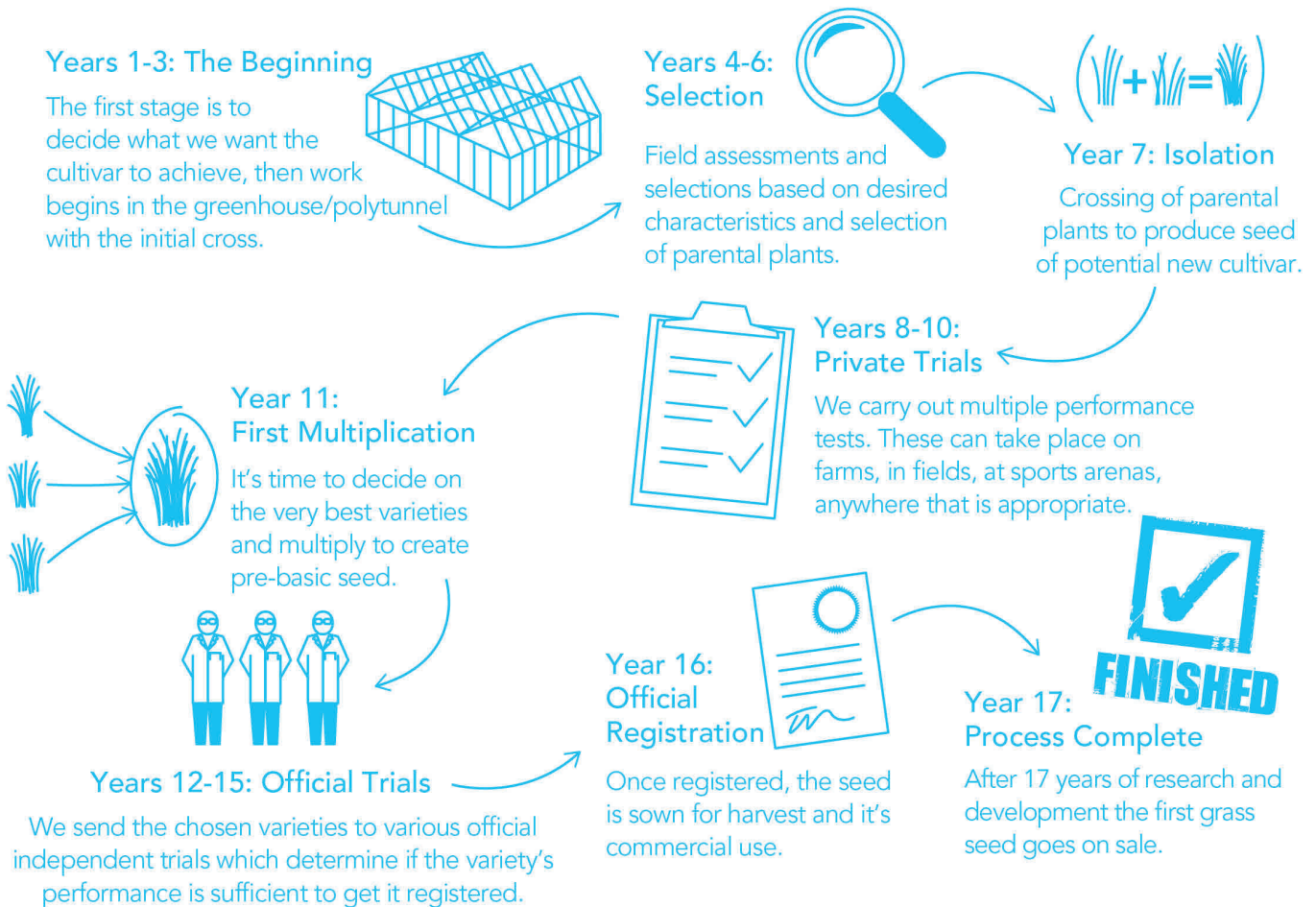
Grass Breeding is a long process, and it can take more than 15 years to get a variety to market from the first cross, so it will be some time before Gillian's varieties are available. But in the meantime, Gillian will be hard at work selecting and testing current material coming from the programme. The future is bright, however. "Advances in new technologies such as novel NIRS-based systems and genomics are making it possible to make more rapid advances in key perennial ryegrass traits such as digestibility, yield and persistency" says Gillian. "Also, key will be putting the focus on new traits that are likely to be vitally important in the future, such as nutrient efficiency and adaptation to stress". Gillian is also particularly interested in factors that affect grass intake and is keen to look for ways to increase palatability and graze-out in swards. "The aim" she says, "is to produce nutritionally balanced, but sustainable varieties, possessing advances in important novel traits, but also well adapted for use in real-life conditions on farm".

**Image above, left to right: Geoffrey Winter, Edwin Herron, David Linton, Gillian Young, Mhairi Dawson, Paul Johnson, Kyle Clarke, Samuel Carroll, Alan Houston**



# The Story of Grass...

The breeding and commercialisation of a new grass cultivar is a long and challenging business.



## BarForage Catalogues

Available online at [www.barenbrug.co.uk](http://www.barenbrug.co.uk)





# East Vs. West

## A catch up with our Scottish Grass Into Gold Farmers

**The drought year in 2018 was a real struggle for many but a godsend for others. Our two Scottish Grass into Gold farms are at either end of the scale and we hear from both perspectives on the past 12 months.**

Robert and Charlotte Baillie who farm a high yielding dairy herd at Longlea in Lanarkshire fared very well in 2018. Being on a heavy farm in an area which normally receives over 900mm of rain, with 157 days of rain and an average annual temperature range of 4.5 – 11.2°C, the dry year of 2018 followed by a spring with less rainfall than average favoured them but even so, their first cut yields were up in 2019. Silage had to be done in two batches as the Italian ryegrass was ready ahead of the perennial ryegrass based swards. Charlotte Baillie comments “The main perennial crop did get a bit wet but was kicked out before lifting and seems to be very little water coming from the pit. We also think that our extensive GPS mapping and subsequent applications of copious amounts of lime has been very important in improving our yields. We were able to get slurry and fertiliser on with ease after first cut which was followed by plenty rain to encourage regrowth and second cut was done six weeks after the first with the aim to complete third cut in another six weeks. The Italians are on a five week schedule although the growth rates this year could allow for a four week frequency!”.

The Baillies are paying very close attention to details such as soil conditions and, particularly with the Italian ryegrass, growth stage to optimise the quality of the grass which is out of sync with the perennials. They have also layered the silage pits with second cut on top of the first to try and improve access to different qualities when feeding. Charlotte concludes, “We are focusing heavily on our grassland management to allow us to

maximise milk from forage and keep the purchased feed costs down. As things stand, we will have enough grass forage so don't think we will need to do any whole crop meaning we will have more home-grown grain and straw for winter too.”

In some contrast, Craig and Katreen Malone at Pitcairn farm in Fife, producers of beef and sheep, felt the brunt of the 2018 drought more fiercely. They farm in an area which averages 5.5 – 12.4°C and has an average rainfall of 772mm and 134 days of rainfall. Comparing the past two years Craig said “They just could not be any more different! In summer 2018 the whole farm was brown throughout the summer whereas this year we have had an abundance of grass all year. Silage this year, with fields receiving the same management and fertiliser input, yielded around 50% of average showing how important water is to grass growth. On a positive, the dry summer and late season meant we were able to keep cattle out for longer last autumn. With a mild winter and early spring, cattle also went out to grass earlier than normal making it a very short winter and a welcome relief in comparison to winter 17/18. We used significantly less straw and sheep feed than normal too.”



**Charlotte Baillie standing in a crop of BarForage High D Italian ryegrass four weeks after its second cut.**

Craig and Katreen have had a very successful year in 2019 topping the sales at both Stirling markets, Thainstone and Carlisle with their crossbred heifers with calves at foot. Their top price was £7000. The couple are now looking forward to the autumn sales for both cattle and mule ewe lambs.

At home, there has been a field of Barabas stubble turnips established which will be used for finishing store lambs. The field has come out of a silage mixture and will be sown down to spring barley in 2020 so will really benefit from the organic matter from the stubble turnips and the lambs over winter.

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Wales and North of England

# Barenbrug

## Grass experts since 1904

Our profession is plant breeding; selecting and developing quality varieties with the essential, unique characteristics to meet the ever-increasing demands from farmers for top quality forage grass.

From its founding days in 1904 the Royal Barenbrug Group has grown into a global seed company with breeding and research stations on six continents.

Still privately owned, our knowledge and experience of grass seed is second to none.

We specialise in plant breeding, seed production and the international marketing of forage grass, forage crops and turf grasses.

With over 800 employees and operating companies in 20 countries on 6 continents, we have been the leading grass seed business in the world for over 100 years.



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