RPR®

REGENERATING

Perennial Ryegrass

DETERMINATE-STOLONS

BARENBRUG®

PLANT A LEGACY.

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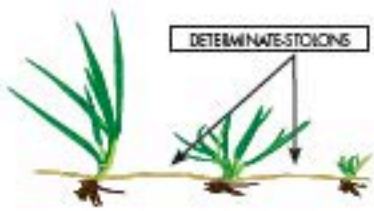
IMPROVE YOUR FIELDS, FAIRWAYS AND TURF AREAS WITH RPR®

In 2009, Brarenbrug's innovative research and development team introduced a unique, one-of-a-kind perennial ryegrass subspecies to the turf industry, RPR®. In January 2015, RPR received a utility patent #8,927,804. With recognition as a new turfgrass distinctly different than traditional perennial ryegrass, *Lolium perenne ssp. stoloniferum*, RPR was first botanically recognized in 1836. Barenbrug's RPR varieties are now the first and only true turf-quality stoloniferum ryegrasses available. Tolerating extremely heavy traffic with outstanding recuperative abilities, RPR provides excellent turf quality and appearance. Far outperforming traditional perennial ryegrass, RPR provides traffic tolerance with early establishment. Resilient and tolerant of tough summer conditions, when perennial ryegrass is the turf of choice, RPR is the ideal selection for your sport and recreational turf facility, golf course and active home lawn.

RPR® REGENERATING Perennial Ryegrass — UTILITY PATENT #8,927,804

DETERMINATE-STOLONS

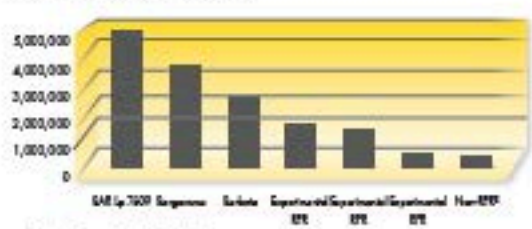
RPR's unique ability to regenerate separates it from both traditional and lateral spreading perennial ryegrasses. A product of advanced breeding techniques, RPR develops **determinate-stolons** which allow for regeneration in all directions.



Determinate-stolons arise from an auxiliary bud near the base of the mother plant and then grow horizontally 6-8" at, or just below, the soil surface, creating identical new plants as they grow. When RPR turf is damaged from an extreme traffic event or worn from persistent traffic, its determinate-stolons will grow horizontally into the worn areas, develop roots and rapidly repair the damaged area. The photos below show RPR plants, determinate-stolons and developed roots.

Protected by patent #8,927,804, RPR's patent includes 50 statements which cover various aspects including determinate-stolon counts, crown perimeter and a determinate-stolon index. Other companies have claimed similar levels of performance from spreading perennial ryegrasses; these other products, however, do not produce determinate-stolons and are not capable of regeneration after severe traffic. Barenbrug extensively tests all of its varieties and RPR is no exception. It has exceeded the company's most stringent quality requirements for traffic tolerance, speedy recovery, drought tolerance and turf quality.

The table below shows a determinate-stolon index that comprehensively characterizes the unique parameters that differentiate *Lolium perenne ssp. stoloniferum* from *Lolium perenne ssp. perenne*. All of the parameters were measured on mowed space plants subjected to traffic. As shown in the table below, the RPR varieties have a determinate-stolon index that is at least 5-fold greater than the non-RPR variety with peripheral tillers.



Determinate-Stolon Index:
Total Rooting Nodes x Determinate-Stolons x Secondary Tillers on Determinate-Stolons = Total Determinate-Stolon Length Sum of 10 Stolons)

*peripheral tillers

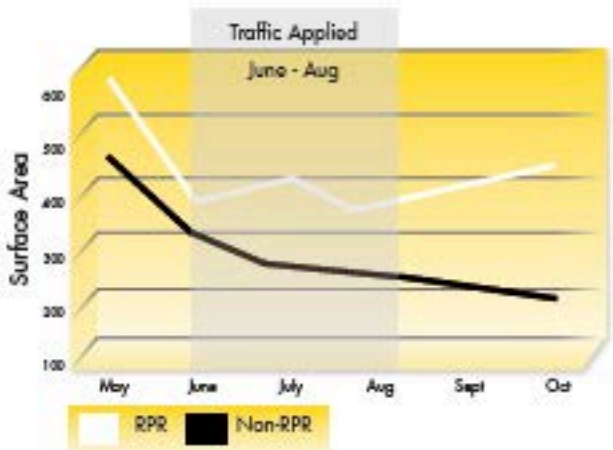
**For details on rooting nodes, determinate-stolons and secondary tillers refer to the graph to the right

YEARS OF RESEARCH – *REMARKABLE RESULTS*

RPR first drew the attention of turfgrass plant breeders at the Barenbrug research site in Virginia where new grasses are developed for traffic, drought and cold tolerance. Researchers noticed that RPR was thriving under very difficult conditions, producing determinate-stolons and recovering in areas of highest traffic stress.

With the best plants selected, continued development of RPR was performed at Barenbrug's turf research center in Oregon. Utilizing the technique of space plants and frequent mowing, Barenbrug's turfgrass breeders studied the lateral growth of RPR comparing it to a typical perennial ryegrass blend.

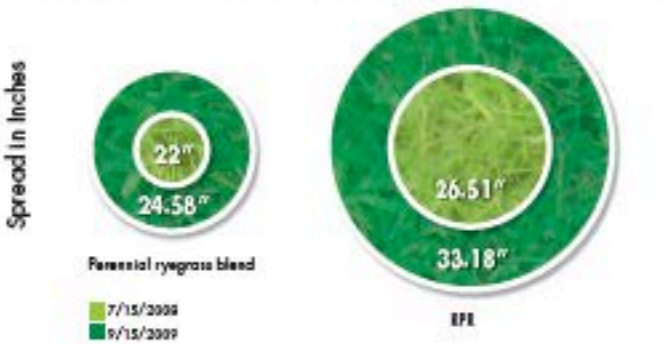
The graph below shows the surface area (cm2) of regularly mowed space plants with traffic. Traffic was applied beginining in June and was used once a week from June to August. Then the the traffic was stopped, so the regeneration of the plants could be evaluated from August to October. RPR was able to naturally repair itself once traffic is lifted vs. non-RPR.



In the graph below, on two recording dates, an RPR plant was significantly larger than a typical perennial ryegrass blend. In September 2009, the circumference of the RPR plant was 33 inches compared to perennial ryegrass measuring 24 inches, an increase of 27% for the RPR.

Within two years, the RPR plants were well rooted, uniform and dense and had grown to three feet wide.

CIRCUMFERENCE OF SPACE PLANTS



RPR circumference compared to a perennial ryegrass blend.

At left regular perennial ryegrass. At right RPR after one year.

The table below represents determinate-stolon counts on Barenbrug's RPR vs. common and spreading type perennial ryegrasses under traffic. The table shows the regenerating ability of RPR through determinate-stolons.

Determinate-stolon and Peripheral (Outside) Tiller Morphology of Perennial Ryegrass under Traffic, November 2011.

	Number of Peripheral (Outside) Tillers	Total Number of Rooting Nodes	Number of Determinate-stolons	Second Tillers on determinate-stolons	Total Determinate-Stolon	Length of Determinate-Stolon (mm)
RPR	29	379	25	134	1103	163
Lolium perenne ssp. perenne	14	107	0	0	0	0

RPR EXHIBITS EXCELLENT ESTABLISHMENT, TRAFFIC TOLERANCE AND RECOVERY

In recent years, RPR performance has been evaluated by turf researchers at several different universities where it was analyzed for fundamental turf characteristics including establishment under traffic, traffic tolerance and recovery. The results: RPR is superior in traffic tolerance trials when compared to traditional perennial ryegrass and maintains high turf quality under these conditions of heavy traffic.

At The Ohio State University, research plots were rigorously subjected to damage by a traffic simulator. In the graph to the right, data supports RPR's ability to maintain quality and integrity despite three days of traffic applied.

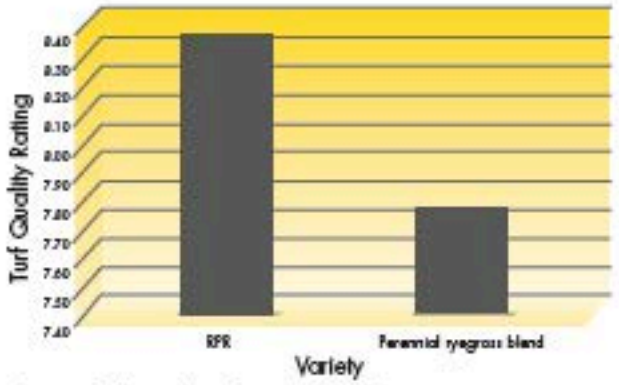
RPR was also tested for traffic tolerance at the Southeastern Turfgrass Research Center in Lexington, Kentucky. As in The Ohio State University study, the results showed RPR to be superior to traditional perennial ryegrass when evaluating traffic tolerance.

In separate studies conducted by Iowa State in 2010, the establishment of RPR was evaluated under various levels of traffic and compared with mixtures containing both Kentucky bluegrass and SOS Turf Annual Ryegrass. Conducted in both the spring and fall, and using a traffic simulator, the trial area was subjected to various levels of traffic intensity. For the spring study, traffic started six days after planting in mid-April. The Kentucky bluegrass never established and the SOS turf annual transitioned as early summer temps spiked. Only the RPR and mixtures containing it thrived and maintained cover during the trial duration through August.

In the Iowa State fall study, an early September planting was again subjected to various intensities of traffic simulation 13 days after planting. Similar to the spring, the Kentucky bluegrass was again the poorest performer, while the RPR and SOS, alone or in mixtures, topped the trial with superior ground cover.

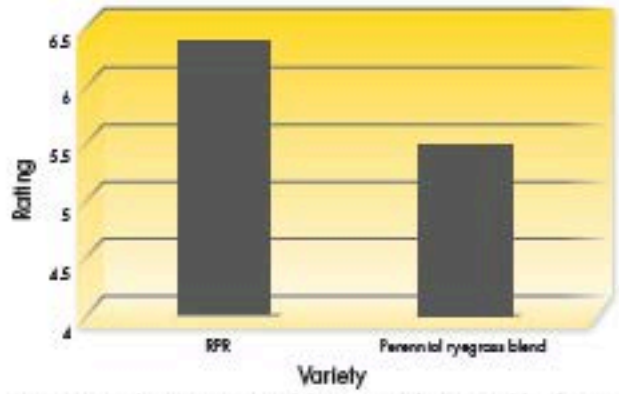
Barenbrug agronomists also evaluated RPR for turf quality at several sites across the US. At the Southeastern Turfgrass Research Center in Kentucky in September 2009, after a long summer of heat stress, the RPR rated significantly higher in turf quality over an average of three perennial ryegrasses. The three perennials failed to meet the minimum acceptable turf quality rating of 5.5.

INTENSE TRAFFIC TOLERANCE - THE OHIO STATE UNIVERSITY



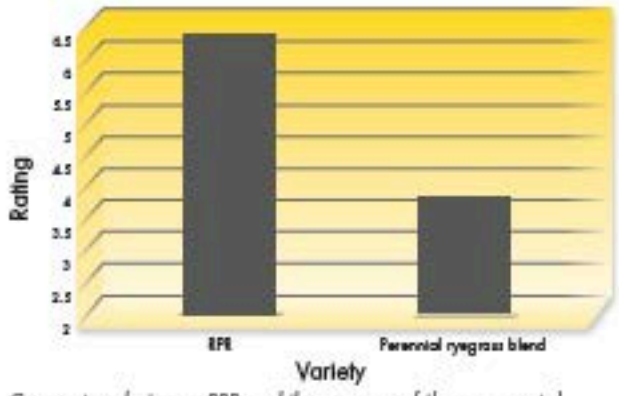
The graph above shows the average of the two RPR varieties compared to a perennial ryegrass blend after three days of intense traffic. Recorded in September 2008. Data from The Ohio State University, P.J. Sherratt, John R. Street and A. Drake.

VISUAL WEAR - MARCH 2008



RPR compared to an average of the perennial ryegrass blend. Data was collected late in the season at the Southeastern Turfgrass Research Center in Kentucky when the pressure on fields is high. RPR performs very well.

TURF QUALITY - SEPTEMBER 2009



Comparison between RPR and the average of three perennial ryegrasses for turf quality. 5.5 is the lowest acceptable turf quality rating for NTEP standards. Recorded at the Southeastern Turfgrass Research Center in Kentucky.

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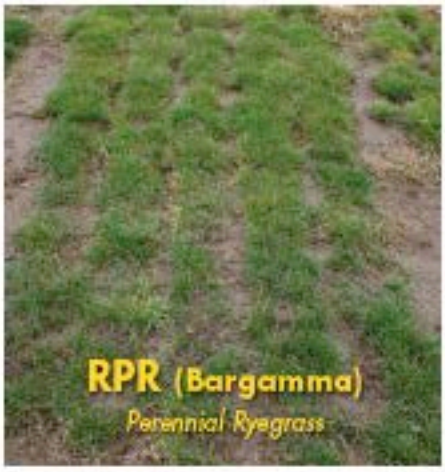
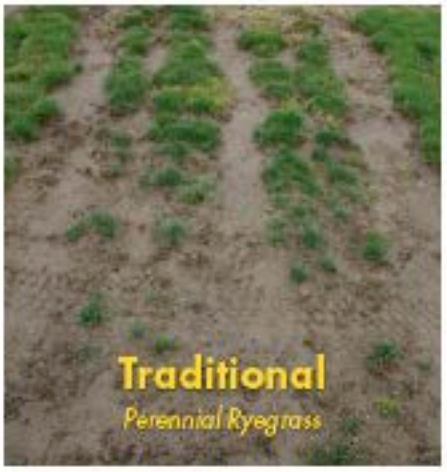
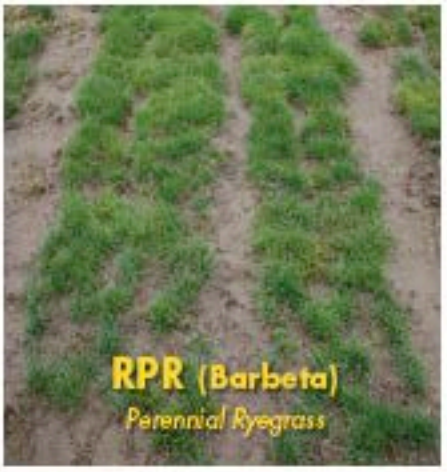
Traffic Study, Barenbrug Research, Albany, Oregon

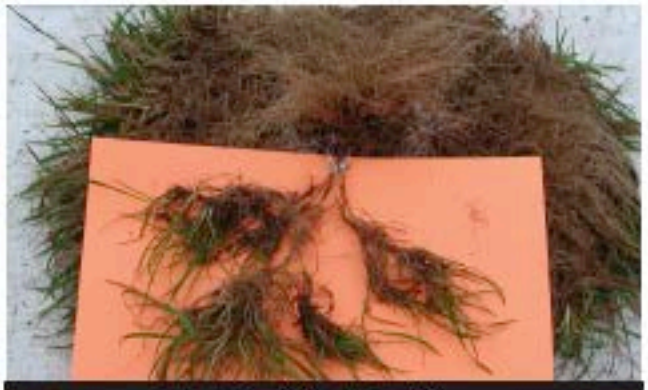






BENEFITS OF RPR REGENERATING PERENNIAL RYEGRASS

- Perennial ryegrass with determinate-stolons
- Extremely traffic tolerant with a strong ability to quickly recover from extreme wear
- Turf of choice for all high traffic perennial ryegrass areas including sports turf, parks, school grounds and golf courses
- High endophyte content for improved stress tolerance and strong transition zone performance
- Strong disease resistance and insect tolerance

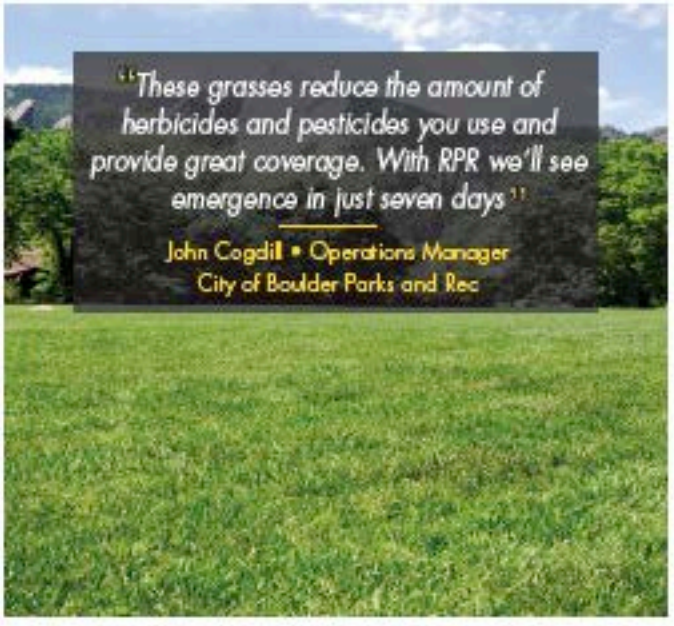


A single determinate-stolon

RPR SEEDING RATE AND BASIC MAINTENANCE

The recommended seeding rate for RPR is 300 lbs. per acre or about 7 lbs. per 1,000 sq. ft. Seeding at lower rates slows establishment, increases weed potential and increases the time needed to establish for use. Quick to germinate and establish, RPR also competes very well when over-seeded into an existing turf. Depending upon use, RPR may be mowed from a fairway cutting height of ¾" to 3".

To maintain healthy quality turf, annual fertilizer and irrigation requirements are similar to traditional perennial ryegrass. Endophyte enhanced, RPR is a very drought and heat tolerant perennial ryegrass blend.



RPR VARIETIES, BLENDS AND MIXTURES

Barenbrug now features three RPR varieties - Barbeta, Bargamma and Barlibro with RPR technology available in several mixes:

RPR: 100% RPR technology, available both uncoated or with Yellow Jacket enhanced seed coating..

Turf Star RPR: Featuring 65% RPR technology paired with 35% traditional perennial ryegrass, available both Yellow Jacket enhanced seed coating or uncoated.

Turf Blue RPR / Turf Blue HGT with RPR: Featuring 20% RPR technology for superior improved traffic tolerance and fast recovery.

SOS Maxx with RPR: The finest in turf annual ryegrass mixed with RPR for superior establishment and traffic tolerance for overseeded high traffic situations. Ideal for winter and early spring traffic tolerance and protection of dormant bermudagrass turf.

BEWARE OF IMITATORS:

Since its introduction in 2009, RPR has proven to be a strong, durable performer. As is common with success, several other seed companies are now claiming similar levels of performance from spreading perennial ryegrasses. These products, however, do not produce determinate-stolons and are not capable of regeneration after severe traffic. RPR is so unique, it is recognized in a category of its own – *Lolium Perenne ssp. stoloniferum.*

UTILITY PATENT

#8,927,804

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