

June 2010

Selecting Superior, Wear Tolerant Perennial Ryegrass

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Selection of the best ryegrass varieties for your golf course, sports field or home lawn involves examining a broad range of characteristics. In general, the current perennial ryegrasses are known for quick establishment, excellent wear tolerance and high turf quality. These characteristics, combined with improved disease resistance and stress tolerance, are constantly being improved by turfgrass breeders. In selecting your ryegrasses it is important to look at many characteristics and to utilize data from unbiased sources including NTEP trials similar to your growing zone or region, additional turf trials with a large number of improved cultivars, or trials with well established control cultivars such as the CTBT trials (Cooperative Turfgrass Breeders Test).

Much of the current focus or interest concerns ryegrass varieties that have been described as “self repairing, knitting or spreading” – traits that has been observed in perennial ryegrass for many years. Scientific references as far back as the late 1800’s describe this trait in ryegrass turf and pastures in various parts of the world.

This ability to spread has been documented in many different ryegrasses. The primary accounts of these plants have come from forage trials with the perennial ryegrass plants grazed, but Minderhoud (1980) also reported on this trait in turf situations. Both the wear and the removal of seedheads contributed to spread of these types of ryegrasses in pastures. Korte and Harris (1987) reported on the stolon development of grazed “Grasslands Nui” perennial ryegrass in New Zealand and although this variety was used in many low cost ryegrass turf blends, the ability to form stolons did not compensate for the poor turf quality and lack of disease resistance of this variety. The turf variety “Barclay” had stolon growth reported in the early 1980’s (Alderson and Sharp, 1994) but did not



Spreading ryegrass germplasm under evaluation in 2006 – Seed Research of Oregon Farm

have the turf quality or disease resistance necessary for much of North America (Rutgers Turfgrass Proceedings, 1982 – 1987).

For many areas, GLS resistance has become the most important and critical characteristic. This devastating disease destroyed many perennial ryegrass plantings throughout the country in recent years. Turfgrass breeders developed resistance to this disease by initially selecting in United States germplasm and later integrating new germplasm from Europe with new disease resistance genes. In addition, many of these new European plants, had a spreading type growth form but lacked other characteristics important for improved perennial ryegrasses such as turf quality, disease resistance, dark color, cool weather growth and heat tolerance. These plants were crossed with the best American material, and the best offspring were further selected for disease resistance and turf quality. They were crossed again over several generations until the plants had gray leaf spot resistance and very high turf quality. As a bonus, some also had a spreading growth habit.

During recent evaluations of well established turfgrass plots on our research farm in Oregon, we found that six out of ten perennial ryegrass plots sampled were exhibiting some level of stolon development. The perennial ryegrass varieties **Harrier**, **SR 4600** and **Zoom** all came out of this European X American germplasm breeding program and, in addition to high gray leaf spot resistance and high turf quality, they do exhibit stolons under mowed turf conditions. In addition, the varieties Quebec, Dasher 3 and Fiesta 4 exhibited the spreading trait in our maintained turf plots in Oregon. With further evaluation, additional commercial and experimental varieties will be found to have this spreading trait. Recent observations of these varieties

indicate that 40 to 60% of the plants show stolons after one year in Oregon in maintained turf plantings. Furthermore, these varieties all have high turf density and quality, excellent mowing quality and high disease resistance. Used in a blend or mixture, the inclusion of a high performance perennial ryegrass variety with the spreading trait may be beneficial for long term wear tolerance, but the true value of the stolon trait has not yet been proven. It is still key for a turf manager to choose perennial ryegrass varieties based on a variety of traits, not just one single trait or characteristic.

In perennial ryegrasses, the mechanisms for wear resistance and recovery have not been well studied with varying levels of management input. Hoffman et al (2010) found that wear injury increased with higher nitrogen levels due to higher shoot

growth rate and tissue moisture levels. Bonos et al (2001) found, in general, that wear tolerance and recovery were related to higher turf quality and density before wear was even applied. Perennial ryegrasses are often utilized in sports fields for their rapid establishment and early wear tolerance and selecting from high turf quality varieties may have the primary role in creating a durable and lasting turf.

To summarize, it is highly recommended that a turfgrass manager use a balanced approach in selecting ryegrass cultivars for use on their project. Look for high turf quality, resistance to important diseases in your area (diseased turf is always less wear tolerant) and high turf density. The ability to produce stolons may also be beneficial for high use turf situations, but no one single trait or characteristic should be the determining factor for your choice of ryegrass cultivars – multiple traits should always be considered.

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