

Rutgers Corner

A look at perennial ryegrass for New Jersey sports fields

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The question of whether or not to establish and/or overseed perennial ryegrass on sports fields is an issue sports field managers in New Jersey face every year. Perennial ryegrass is an attractive choice for fields used for soccer, lacrosse, field hockey, and football because it has the ability to germinate and establish quickly when overseeded and can show good traffic tolerance if a proper variety is chosen. However, the susceptibility of perennial ryegrass to winter ice damage and numerous diseases has led many sports field managers across the Garden State to establish Kentucky bluegrass and/or tall fescue as an alternative(s) on their sports fields.

The case for perennial ryegrass

Along with a darker green color, increased shoot density, and finer leaf texture, many new perennial ryegrass

varieties contain fungi called 'endophytes' that improve tolerance to the damage caused by surface feeding insects including billbugs, sod web worms, and chinch bugs. The mutually beneficial (symbiotic) relationship between the fungus and perennial ryegrass is an effective method of biological control of insects and the establishment of 'endophyte-enhanced' perennial ryegrass varieties is an integral part of an Integrated Pest Management (IPM) program.

Perennial ryegrass tends to be more tolerant of postemergent herbicides compared to Kentucky bluegrass, therefore allowing for higher application rates. For example, Acclaim Extra is a herbicide labeled for the selective postemergent control of crabgrass in perennial ryegrass and Kentucky bluegrass. The Acclaim Extra label clearly states that no more than

0.64 oz per 1000ft² of product may be applied to Kentucky bluegrass per application where as up to 0.90 oz per 1000 ft² may be applied to perennial ryegrass. Similarly, Prograss, a herbicide labeled for the selective postemergent control of annual bluegrass in Kentucky bluegrass and perennial ryegrass, may be applied at 1.5 oz per 1000 ft² to Kentucky bluegrass with a minimum 6-week Kentucky bluegrass overseeding safety interval whereas 2.0-4.0 oz of product per 1000 ft² may be applied to perennial ryegrass with only a 1-2 week perennial ryegrass overseeding safety interval.

The strongest argument in support of perennial ryegrass use on New Jersey sports fields was detailed by Brede and Duich (1982) where they note that perennial ryegrass will germinate in as little as 4 days, grows and develops

continued on page 6

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continued from page 5

quickly, and tolerates moderate amounts of wear within a few weeks of germination. Recent data collected at Rutgers involving applying traffic (wear and compaction) to varieties and selections comprising the 1999 National Turfgrass Evaluation Program test has revealed a number of commercially available perennial ryegrass varieties demonstrating good tolerance to traffic. Following applications of wear and compaction from August through November 2003, 40 perennial ryegrass varieties and selections (134 total entries) were shown to be the top performers when assessed for turfgrass quality under traffic. Of the 40 top performing varieties and selections, the following commercially available varieties showed mean turfgrass quality¹ ratings of 5.7 and above (Quality is assessed on a scale of 1-9 where 9=highest quality): SR 4500 (6.7), Citation Fore (6.3), SR 4220 (6.0), Racer II (5.7), SR 4350 (5.7), Galaxy (5.7), Catalina II (5.7), Line Drive (5.7), Pacesetter (5.7), Sol (5.7), and Radiant (5.7).

Perennial ryegrass limitations

Despite numerous perennial ryegrass varieties showing good traffic tolerance when evaluated at Rutgers, the bunch-type growth habit of perennial ryegrass significantly limits the recuperative potential of the species. Perennial ryegrass is limited to recolonizing divots slowly by basal tillers. Kentucky bluegrass establishment on high-use sports fields is advantageous due to its rhizomatous growth habit. Turfgrasses with a rhizomatous growth habit (Kentucky bluegrass) are characterized by relatively small divots and a more rapid recuperative potential since regrowth and recovery can occur from rhizomes under the center of the divot as well as from the sides. While divot recovery of Kentucky bluegrass sports fields may be facilitated via fertilization, damage of perennial ryegrass stands must often be accomplished by overseeding.

Perennial ryegrass on New Jersey sports fields is susceptible to prolonged cold temperatures and ice cover. McCarty (2000) found that 50% of a perennial ryegrass stand may be killed when soil temperatures at a depth of approximately 4.0 inches fall to between 23 and 5° F. In contrast, Kentucky bluegrass demonstrates far greater cold tolerance, as similar levels

of kill are not achieved until soil temperatures at the same depth fall to between -6 and -22° F. Additionally, following an ice storm in 1994, many golf course fairways comprised of perennial ryegrass in the mid-Atlantic region were heavily damaged as a result of prolonged ice cover with some golf courses reporting as high as 90% turf loss (Zontek, 2002).

Perennial ryegrass sports fields are susceptible to a number of fungal diseases that can be both destructive and expensive to control if fungicides are applied. Among these diseases includes: stem rust, brown patch, dollar spot, pythium, leaf spot, and gray leaf spot. Gray leaf spot can be particularly devastating as Vermeulen (1999) stated that up to 90% of a golf course fairway comprised of perennial ryegrass may be killed if left unprotected though the use of fungicides. Gray leaf spot develops in perennial ryegrass during periods of warm days with high humidity and prolonged leaf wetness in late summer (mid-August to early October).

Conclusions

Because perennial ryegrass is such a practical and efficient overseeding choice and many varieties display good traffic tolerance, it is not appropriate to dismiss its use on New Jersey sports fields. If considering perennial ryegrass in a seed mixture or as an overseeding species, realize that perennial ryegrass grows vigorously during cool moist weather and is further enhanced by high soil fertility and fertilization. As a result, perennial ryegrass is highly competitive in mixtures with other turf species, and these mixtures often result in turfgrass stands dominated by perennial ryegrass.

There are several general strategies to minimize the onset or severity of gray leaf spot disease in perennial ryegrass in

the absence of a fungicide program. Keeping in mind that gray leaf spot is most severe during warm/high humidity days in late summer, it is important to minimize turfgrass leaf wetness during these periods. One strategy is avoiding early morning and nighttime irrigation. It is advisable to examine weather forecasts and schedule "deep and infrequent" irrigation cycles on lower humidity days. As an overseeding strategy to minimize gray leaf spot, the Plant Diagnostic Laboratory at Rutgers University has been recommending overseeding perennial ryegrass following Labor Day in New Jersey. While this recommendation deviates from the traditional mid-to-late-August renovation timing, the quick-germinating and quick-establishment characteristics associated with perennial ryegrass allow for the "optimal seeding window" to be delayed. Lastly, the Rutgers Breeding program has focused much attention to selecting experimental perennial ryegrass varieties that show resistance to gray leaf spot. Several experimental varieties have shown good resistance and are expected to be available commercially in Fall '04. Choosing disease resistant varieties is an effective tool to manage turfgrass diseases and is another core component of an IPM program.

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