CORNELL UNIVERSITY TURFGRASS TIMES

CUTT

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Modern Turfgrass Development

Any effort to improve resource efficiency begins with the selection of a properly adapted turfgrass. Adaptation is the precursor to determining competitiveness. Simply if a turfgrass is well adapted to an environment (soils, management and traffic) it will be competitive with pests, especially invading species such as annual bluegrass. Increased competitiveness will allow for more efficient use of resources.

An important tenet of integrated pest management (IPM) is utilizing all available resources to maintain pests below a population that would cause unacceptable injury or reduction in visual quality. Too often any discussion of IPM moves past turfgrass selection and immediately to altering the growing environment or using pesticides. For example, several years ago a new bentgrass variety was released with known susceptibility to dollar spot. Several industry leaders argued that this was an "easy disease to control" and the grass should be used because of other technical benefits.

Most turfgrass managers are unwilling to broach the subject of using new cultivars because of the disruption associated with the process. Research has shown that to successfully incorporate new cultivars, competition from the existing turf must be eliminated. Elimination can involve drastic vegetation management with herbicides or soil fumigants. Attention will be paid to the process by the athletes and the risks can be great.

In this day of "fast" greens and perfect lawns, using a grass with high shoot density seems prudent. Yet, few turfgrass stands over the age of 30 are renovated to utilize new cultivars. Is it because of the inconvenience of resurfacing? Are the new cultivars better in a way that matters, i.e., pest resistance, competitive with annual bluegrass or stress tolerant? Did the breeders miss the mark with new grasses or do we just not know enough yet?

The Process

Doug Brede, Research Director of Jacklin Golf, says "turfgrass managers need to hear about grasses from friends, touch them and

continued on page 4

This Times

1. ***Modern Turfgrass Development***
2. ***Short Cutts***
   - Emmons honored
   - CU grad Watson Fellow
   - NYSTA keeps you informed
3. ***Scanning the Journals***
   - Exploring salt tolerance
   - Reducing phosphorus
6. ***Horticulture Analytical Laboratory***
7. ***Better Sprayer Design***
8. ***Reduced & Nonchemical Turf Management***
23. ***Turf/Landscape Field Day***
24. ***Biological Control of Turfgrass Diseases***

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CUTT

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continued from page 1

bond with them before they are willing to use them. In fact," Brede continues, "it is difficult to get turf managers to agree on what is the most important feature in a turfgrass."

Professor Jim Murphy and colleagues at Rutgers University investigated the relationship between bentgrass cultivar and time of seeding for annual bluegrass invasion. An existing bentgrass and annual bluegrass putting green was killed with a nonselective herbicide. This leaves the annual bluegrass seed bank intact.

After the existing turf was killed, different bentgrass species and cultivars were seeded in May, June, August, September, or October. Most surprisingly, June seeding dates consistently produced the highest bentgrass populations. Penncross consistently had lower bentgrass populations than the other cultivars. Providence had similar bentgrass populations compared to Penn A-4, L-93 and SR7200 (velvet bentgrass) for June, August and September dates. Providence had less bentgrass than the same cultivars at the May and October seeding dates. Penn A-4 and L-93 had consistently higher bentgrass population except for SR7200 over all seeding dates.

This study questions one of the longest held principles of turf establishment, i.e., August and September are the best months for establishing turfgrasses from seed in northern climates. Also, it demonstrates the variable competitiveness of bentgrass species and cultivars.

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A subtle finding of this study addresses those interested in maintaining consistency among existing greens when one is renovated. For example an older course with mostly bentgrass and annual bluegrass greens desires the new green to perform like the other greens. This could be accomplished by seeding the new green with a poor competitor such as Penncross at a time such as August when the annual bluegrass would invade successfully. This would result in mixed bentgrass and annual bluegrass surface with improved rootzone or enhanced growing environment and do little to exploit the advantages of new bentgrass cultivars.

Disease Advantages

With pending drought conditions across the US, more water use efficient cultivars would be the highest priority for many golf course superintendents. However, little meaningful differences exist among commercially available turfgrass for putting greens. The next most important trait from an environmental perspective would be a cultivar that required less pesticides to provide acceptable quality as a first step in an IPM program.

A study was conducted at Kansas State University by Professors Jack Fry and Ned Tisserat to evaluate the influence of bentgrass cultivar on disease management programs. Crenshaw, L-93, Penncross and Providence were managed under typical putting green regimes for KS. Various fungicide programs for dollar spot and brown patch were implemented as preventative or curative (after infection).

Untreated plots of L-93 were the most resistant to dollar spot providing acceptable quality on 70% of the rating dates in the first year then less than half of the rating dates in the following two seasons. Interestingly, all of the unacceptable rating dates for L-93 occurred after the mid-July stress period. Fry and his colleagues suggest this could allow for reduced fungicide use in the early season on L-93.

Crenshaw is very susceptible to brown patch and dollar spot. This was evidenced by the complete inability to produce acceptable quality ratings without fungicides. Moreover, the length of control afforded by certain fungicide programs was reduced on Crenshaw presumably as a result of the susceptibility.

In areas with light disease pressure such as more arid climates, the selection of L-93 or other disease resistant turfgrasses could significantly reduce fungicide use. Additionally, lower fungicide rates and strictly curative disease management programs that use less fungicide are possible with more disease resistant turfgrasses.

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Change Species?

"If fungicides are not available for use," states Professor Jim Murphy of Rutgers University, "maybe we have to change grass species." Looking more closely at the research at Rutgers University led by Professor Bill Meyer, the reasons become clear. Meyer, Murphy and the rest of the Turfgrass Team at Rutgers are exploring the velvet and colonial bentgrasses.

The experimental velvet and colonial bentgrasses are performing as well as creeping bentgrasses under the battery of tests performed on traffic, pests and other stresses. These species appear to be more competitive against annual bluegrass, provide high quality under low

light and are more resistant to certain pests than the average creeping bentgrass.

In an effort to exploit the dollar spot resistance (almost immunity) velvet bentgrass was installed on three putting greens on the Bethpage Green Course. The Green Course is the site of the USGA-sponsored project to develop nonchemical approaches to putting green management (see related story on page 8). The three greens were completely devastated by dollar spot in 2001 when not treated with fungicides. Many questions remain unanswered about this grass, but several golf courses in the northeast are using it successfully. The key might be managing it properly and keeping the annual bluegrass from invading the site.

Implications and Modifications

Performance factors such as tolerance to low mowing have been improved with many of the new bentgrasses and Bermudagrasses. However, there are some consequences from these developments. When the turfgrasses are mowed lower, ball roll distance (green speed) increases. This is forcing many golf course architects to design less dramatic undulations in their putting greens for fear of rendering the surface unplayable. Also, there are challenges to incorporating surface drainage into the design when surfaces are "flatter".

I often wonder why in our pursuit of turfgrasses that help superintendent's meet increasing golfer expectations, there weren't more turfgrasses that address society's interests. The 88% of the American public that does not care about green speed, does care about water use on golf courses as well as pesticides and fertilizers that could contaminate drinking water.

Paradoxically, genetically modified turfgrasses offer the best opportunity for rapid development of turfgrasses that meet society's needs. Yet it is this technology that inspires the wrath of that same society it might serve best. The ability to insert particular traits into turfgrasses needs more research.

Roundup Ready turfgrasses will be with us shortly and the debate will continue. How will we plant these turfgrasses? When is the best time? What is the best management program? Ultimately the real benefit of this technology will be realized when it is fully integrated into course design and management, not looked at in a vacuum.

Frank S. Rossi

Clippings

continued from page 2

Subsequently, the information is transferred in a meaningful way through the quarterly newsletter, *Cornell University Turfgrass Times (CUTT)*. Yet it seems that information is needed in a more timely fashion than ever before. Also, NYSTA members must be aware of research beyond New York's borders so that the best thinking can be brought to bear.

Several years ago the Cornell Turfgrass Team began the weekly electronic newsletter *ShortCUTT* to meet the needs of an information hungry industry. Not only is the information the latest, but it is delivered in a timely fashion, right when you need it—during the growing the season!

For 30 weeks, a succinct 2-page newsletter is emailed to NYSTA members with the latest weather records and forecast with exclusive access to a weather web site. Also, regional observations from experts in the field and an update from Frank Rossi. Finally there is a current topic that is discussed by the leading expert in the world. Much of the information is not available through any other source because of Cornell's unique access to university and industry experts.

The cost to you as a NYSTA member is supplying your email address. A major grant from NYSTA allows us to provide this service to members at no charge. So, send your email address today to shortcutt@nysta.org and be ready when the 2003 season begins.

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