PERENNIAL WEEDY GRASSES

Quackgrass, bentgrass, tall fescue and nimblewill are perennial grasses that disrupt turfgrass quality and reduce the marketability of sod. Since there are no selective chemical controls for these weeds, nonselective herbicides have been used for spot-treating clumps and patches of undesirable perennial grasses. Dalapon and amitrole have been used for several years for this purpose; however, weed control has not always been satisfactory and the residual activity of these herbicides delays turfgrass recovery into treated areas. Recently, glyphosate (Monsanto's Roundup) has been shown to be effective in controlling perennial grasses while the lack of any residual activity following its use allows for rapid turfgrass growth into treated areas. Results from research have shown that treated sites can be reseeded soon after application of glyphosate. However, sufficient time should be allowed between chemical treatment and disc seeding to facilitate translocation of the herbicide within the plant; otherwise, the mechanical severing of stolons or rhizomes that accompanies disc seeding may interfere with herbicide translocation and, hence, control of the weed species.

SELECTION OF KENTUCKY BLUEGRASS VARIETIES

The intraspecific variability of Kentucky bluegrass has allowed the development of many varieties and experimental selections that differ widely in their color, texture, density, environmental adaptation, disease susceptibility, and other factors. The basis for these breeding efforts is that improvements in the characteristics and adaptation of a turfgrass reduce its dependency on cultural practices designed to compensate for specific weaknesses. Thus, turfgrass management is made simpler and higher turfgrass quality is obtainable with the use of improved varieties.

The diseases of principal importance have been Helminthosporium leaf spot, Sclerotinia dollar spot and Fusarium blight (Table 2). Those varieties showing the least injury from these diseases were: A-20, A-34, Adelphi, Baron, Bonnieblue, EVB-282, EVB-391, Galaxy, Glade, K1-131, K1-132, K1-143, K1-155, Majestic, Cheri, Monopoly, P-59, P-140, Parade, PSU-150, Sodco, Touchdown, Victa and Windsor. The summer quality data reflect both disease incidence and summer stress tolerance. Thatch development varied from 0.71 to 1.91 cm thick, depending upon variety. There is reason to believe that thatch has an important effect on summer stress tolerance since Nugget typically declines as summer temperatures rise while, at the Belleville site in southern Illinois, the absence of thatch in Nugget is associated with substantially better summer quality.

The blends reflect disease and quality levels that represent compromises between the two component varieties. Considering the fact that no variety is perfect, blending superior varieties allows for incorporating the desirable features of each component while reducing the impact of a specific weakness on general turfgrass quality. The Kentucky bluegrass (Fylking)- fine fescue mixtures have not been good turfs due to the poor adaptation and high disease susceptibility of the fescues. The Fylking-Pennfine (perennial ryegrass) mixture is predominantly perennial ryegrass and its quality through the season is similar to that of Pennfine alone.

SOIL-LESS (WASHED) SOD

A new and potentially important development by Warren's Turf Nursery is "soil-less" sod. Recently harvested sod is washed free of soil with a device that employs a steel conveyer belt, a series of water jets for washing, and a roller assembly to squeeze excess water from the sod. The resulting sod is lighter, easier to handle, and less costly to transport. Research results have shown that, under moderate climatic conditions, soil-less sod roots faster than conventional sod. Also, soil

removal does not significantly reduce sod strength since the strength of a sod section is primarily due to the interlocking system of roots or rhizomes that remains with the washed sod. Another potential advantage of soil-less sod is the avoidance of an interface effect due to differences between soil types occurring at the sod production and transplant sites. One obvious concern with soil-less sod is the higher desiccation potential after planting, especially during stress conditions. Also, the nutrient requirement of soil-less soil that has been planted on very sandy media are higher than for conventional sod since little or no nutrients are carried with the sod after soil removal.

PROCESSED TURFGRASS CLIPPINGS

Mowing is one of the primary cultural practices necessary for sustaining turf. Clippings resulting from regular mowing are either picked up and discarded, or returned to the turf where they decompose. In view of the traditional use of grasses for forage, it is likely that turfgrass clippings could be successfully employed for feeding livestock and other animals. As turfgrass cultivars and cultural practices are substantially different from those employed in forage production, investigations were initiated this year to determine the relationship of turfgrass species, cultivars, mowing and fertilization to the nutritive value of clippings from these turfs. Lutein, a non-epoxide xanthophyll important as a pigmenting agent in poultry feeds, was found to occur in large quantities in Kentucky bluegrass clippings from sod farms in California. Clippings were collected from 20 Kentucky bluegrasses, four perennial ryegrasses and K-31 tall fescue in May and analyzed for lutein using an acetone extraction and thin-layer chromatographic separation of the pigments. Colorimetric determination of lutein was made from extracts from the TLC plates. Lutein levels ranged from a low of 72 mg/kg fr. wt. in Vantage Kentucky bluegrass to a high of 358 mg/kg in Adelphi Kentucky bluegrass (Table 3). Thus, selection of a particular turfgrass cultivar substantially affects the lutein yield from the clippings. Clippings were also collected from Kentucky bluegrass fertilized with 0, 0.25, 0.5 or 1.0 kg N/are/mo. Results showed that lutein increases significantly from increasing nitrogen fertilization, but the increases were of a relatively low magnitude.

Turfgrass clippings offer a potentially important source of protein in animal feeds, especially for ruminants (sheep, cattle, etc.) which can digest the cellulose within the plant tissue. Crude protein levels were determined in dried clippings by Kjeldahl analysis for total nitrogen (X 6.25) in 53 Kentucky bluegrasses and 8 perennial ryegrasses. Within the Kentucky bluegrasses, crude protein levels ranged from 22 to nearly 33 percent depending upon cultivar (Table 4). The perennial ryegrasses ranged from 26.3 to 30.2 percent crude protein.

The dynamic nature of turfgrass technology and sod marketing conditions requires that sod growers keep abreast of new information from on-going research. Expanded results from scientific investigations provide important guides for selecting varieties and blends at planting, incorporating pesticides and other materials into production techniques, and modifying sod handling methods. The sod grower can no longer assume that what is considered satisfactory today will be adequate for tomorrow. At the same time, the challenges and opportunities that exist today can yield substantial gains for the sod grower who makes wise choices in light of new technical developments.