STOP 4

J. B. Beard

Modifying the Turfgrass Environment

The turfgrass microenvironment involves the conditions and influences immediately surrounding the turfgrass plant that effect growth and development. A significant aspect of turfgrass culture involves the manipulation of the turfgrass microenvironment in order to provide more favorable conditions for growth, development, and recuperation of the turf. Thus, it is important that turfmen have a good understanding of the microenvironment and also utilize procedures to periodically monitor certain aspects of the microenvironment so that they have a better basis on which to make decisions regarding turfgrass cultural practices.

Soil moisture and temperature are the most easily monitored and modified components of the turfgrass microenvironment. Soil moisture levels can be monitored by use of a soil probe, electrical resistance sensors, or tensionmeters. Electrical resistance sensors are effective in measuring soil moisture in the moderately dry range, while the tensionmeter is more sensitive in moist to wet soil conditions typical of those found under intensely cultured turfs. The presence of a thatch or dense compacted soil surface interferes with successful use of tensionmeters. Both sensing devices are normally placed at a soil depth representative of the active turfgrass root zone usually between 2 and 6 inches.

Temperature is also an important indicator in monitoring turfgrass growing conditions. Actually, the soil temperature in the upper 6 inches of the root zone is a far more reliable indicator of growing conditions than the air temperature. Several random samplings of soil temperature throughout a turfgrass area at varying depths can be readily made with a soil thermometer. They are available with sensing probes that reach to a depth of 6 to 10 inches, depending on the length of the probe. Continuous diurnal monitoring of soil temperatures at one or two given locations can also be achieved with a 7 day mechanical thermograph. The latter is preferred where documentation of seasonal temperature conditions on the turfgrass area are being maintained. This can be particularly helpful in locations where adequate weather bureau records are not available.

Syringing. Temperature modification can be achieved through syringing. Investigations at M. S. U. show the time of syringing to be particularly important in achieving maximum temperature modification. Syringing for turfgrass cooling should be considered when soil temperatures approach 75° F. Where the objective is to modify temperature, the syringing application should be made between 11:00 a.m. and 12 noon. A syringing made at 1:00 to 2:00 has very little effect on the turfgrass temperature. However, syringing may be required between 12:00 noon and 2:00 p.m. should wilt occur since this is the period of highest evapotranspiration rates.

Winter Protection. Investigations at M. S. U. during the winters of 1968-69 and 1970-71 indicated that several materials can be effectively utilized as winter protection covers. Included were the Conwed Winter Protection Cover, Soil Retension Mat, Saran Shade (94%), and topdressing. The first three had superior performance in terms of desiccation prevention, low temperature insulation, and controlled early spring greenup. The topdressing practice is primarily effective in preventing winter desiccation.

During the winter of 1970-71 a range of topdressing rates were evaluated. Included in the test were rates of 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, and 0.8 cubic yards per 1000 square feet. The soil was applied uniformily to the experimental area but not matted in. The study was conducted on 5 x 8 foot plots with three replications. Observations made during the winter and early spring period revealed the 0.3 to 0.4 cubic yard per 1000 square feet rate to be preferred in terms of protecting against winter desiccation without leaving an objectionable amount of soil on the surface which restricted spring greenup. It should be pointed out that the practice of topdressing is primarily effective in preventing winter desiccation and has no effect in reducing snow mold. Thus, it is important to apply the appropriate snow mold fungicide prior to making the topdressing application in late fall.

STOP 5

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Fine Leaved Fescued Variety Evaluations

The red and chewings fescues are best adapted to shaded sites and droughty, sandy soils maintained at a minimal nitrogen fertility and irrigation level. Forty-five fine leaf fescue varieties were established September 13, 1968, for comparative evaluation under lawn-turf conditions. The plot size is 5 x 8 feet with 3 replications. The experimental area is cut at a height of 1.2 inches twice per week with clippings returned. Irrigation is supplied as needed to prevent wilt. A split-plot nitrogen application has been made across the plots at rates of 2 and 4 lbs nitrogen per 1000 square feet per year. No fungicides or herbicides have been applied to the experimental area since establishment.

C-26, a hard fescue has consistently ranked highest under conditions of this experiment (Table 5). This high level of performance can be contributed primarily to a higher level of Helminthosporium leaf spot resistance compared to the red and chewings fescues included in this study. Among the red fescues, which have a more creeping growth habit, Bergere, Brabantia, Arctared and S-59 have all ranked higher than Pennlawn red fescue.