Made in the Shade: Using PGR's on Shaded Turf

Estimates are that approximately 25% of all turfgrass areas are managed under some type of shaded conditions. When a turf is shaded by vegetation, such as a tree canopy, not only is the amount of light reduced, but rather the quality of light is reduced. For example, because tree leaves are green, they remove almost all the light that is useful for photosynthesis. The remaining light that penetrates the turf canopy is significantly altered and triggers certain plant hormones that result in a unique growth response.

Researchers at Michigan State University have been investigating growing turf under low light, but not under a tree canopy. Drs. John Stier (now at the University of Wisconsin, Madison) and John (Trey) Rogers have been working on growing grass in indoor stadia, similar to their project for the 1994 World Cup. Under these conditions, the challenge is not only reduced light, but also intense traffic from sports such as soccer.

A covered stadium simulator facility (CSSF) was constructed to determine if the plant growth regulator (PGR), Cutless (flurprimidol), applied to a Kentucky bluegrass stand and known to influence specific plant hormones, could enhance turf quality. Cutless was applied above, at and below the labeled rates after placing the turf into the CSSF and again at 6 weeks. Fertilizer applications were made to supply 4 lb. of nitrogen per 1000 square feet per season. Simulated traffic was applied to determine traffic tolerance and general turf quality assessments were made to evaluate the length of time the turf provided acceptable quality under low light. Surprisingly, results indicated that the below label rate afforded high quality turf without traffic up to 70 days. When supplemental lighting was supplied with Cutless treatment, the turf provided acceptable quality for 100 days. Additional rooting and tiller data suggest that the PGR is able to alter the hormonal response and improve the elasticity of the shoots to allow for improved clipping quality. Therefore it appears that the average shady turf, with limited traffic, could benefit from light rate applications of a PGR to improve quality, however, research is continuing into the relationship between PGR's and fertilization.

(From: Stier, J.C., J.N. Rogers, J.R. Crum, and P.E. Rieke. 1999. Flurprimidol effects on Kentucky bluegrass under reduced irradiance. Crop Science 39:1423-1430.)

Do Winter Covers Work?

Throughout the northern climates, there is considerable concern regarding turfgrass winter injury. It is estimated that many northern turf areas will suffer some form of severe winterkill at least once every 3 to 5 years. This is particularly problematic on high value areas such as golf putting greens where snow cover is inadequate to protect the turf from temperature extremes. Consequently, golf turf managers have been using various types of protective covers to essentially mimic the protective effects of snow cover, with literally no scientific data to support any benefits.

To address this important issue from a scientific perspective, researchers at Laval University in Canada, investigated the influence of various winter protective covers on turfgrass winter injury, soil and crown level temperatures. The study was conducted at locations in Quebec City, with thick, stable snow cover on creeping bentgrass, and in Montreal with thin, unstable snow cover on annual bluegrass. Five covers plus an uncovered plot were tested including, 1) permeable and 2) impermeable Evergreen covers, 3) a curled wood-shaving mat (AKA, Excelsior Mat); and 4) 2 inches of air space plus an impermeable cover, and 5) 7 inches of straw with an impermeable cover. Covers were applied in early to late November prior to snow cover.

The Quebec site that sustained deep snow cover resulted in no significant difference in injury or measured temperatures, however significant injury was noted from snow mold disease. In contrast, the Montreal site demonstrated a clear benefit of the protective covers that maintained an air space below an impermeable cover. In fact, covers without the air space resulted in significant winterkill of the annual bluegrass. Therefore, it can be concluded that under prolonged snow cover the most important aspect of survival is disease prevention, yet under fluctuating snow cover, insulating materials such as curled wood mat, straw or air space under an impermeable cover can reduce soil temperature fluctuations, minimize the influence of freezing temperatures and thin snow cover consequently enhancing the winter survival of golf greens.

(From: Dionne, J., P.A. Dube, M. Laganiere, and Y. Desjardins. 1999. Golf green soil and crown-level temperatures under winter protective covers. Agronomy Journal 91:227-233.)

Scanning the Journals

A review of current journal articles

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