PREPARING FOR TURF STRESSES IN 1989

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Golf course superintendents must have more opportunities to learn than anyone in golf or in the turfgrass industry as a whole, and rightly so because there are so many facets of the game which demand their attention. In the gentler days, greens were everything as long as a golfer could drive a peg into the tee and the fairways were cut once or twice a week. Those days are gone forever and some Turf Advisory Service visits today are more involved in bunker quality than putting quality. What a fine compliment to those superintendents' turf managing abilities.

Even so, we still do not know how to grow grass without leaves. Ultra close mowing does a great job of defoliation which reduces the photosynthetic potential of the turf. It is necessary, then, to determine the minimum TRUE mowing height for the turf species and cultivar involved. Some cultivars were selected under a quarter-inch height of cut. Bench settings are the published part of the story and vary from machine to machine. The only gauge we have is the consistent trueness of line and the drag on a ball as it rolls after being struck.

Putting consistency is greatly enhanced by light and frequent topdressing, the control of fertility and good water management. Fertility control should be the most easily managed factor. We have the information on nitrogen release patterns of most sources and should be able to plan accordingly. Every nitrogen component of blended fertilizer must be taken into account when programming applications through the growing season, since their conversion to nitrates may depend on soil temperature, soil moisture **and** soil air (the source of oxygen needed for the conversion of ammoniates to nitrates).

Vargas has pointed out the depletion of soil oxygen after sulfur application to near-anaerobic soils. Its conversion to sulfate depletes the soil oxygen further and then anaerobic bacteria convert the sulfates to sulfides which results in the formation of black layer. He suggests the application of nitrates as a source of oxygen for the anaerobic bacteria. This nitrogen, of course, will be lost as a gas through the process of denitrification under anaerobic conditions. Would not the same oxygen demand occur during the nitrification of ammonium nitrogen in the soil?

The point here is a constant need for a supply of oxygen in the soil for these and other biological processes in the soil. This is a reason why high sand content greens performed so well last summer. Water percolated through the profile readily, pulling air into the non-capillary pore spaces as they drained.

These are fine points, to be sure, but as long as we are dealing with defoliated turf we need all the help we can get. There are few black or white options. For instance, at what point does shade become a limiting factor? Or, how much wind movement is necessary across a putting surface for best moisture and heat dissipation?

It is now mandatory to exert maximum control on the controllables. Sand quality is easily determined by sieving and particle size distribution can be specified. This is a simple and direct situation. The success of straight, uniformly sized sand topdressing has been widely demonstrated since Madison proposed it in 1974. Organic additives are another story, and are bothersome.

Peat bothers me because of the tremendous variation possible in the sources. The amount of detrimental non-organic material can vary widely within a very small area in a "mine". Clay, silt and very fine sand content can be amazingly high in peats that "look" and "feel" good. The only judge of quality is a rather detailed laboratory test. In construction, quality control is possible because purchases are in large, checkable lots. In year-to-year topdressing, though, some change is inevitable.

We cannot argue with the success that many superintendents have had with sand/peat topdressing, even though an 80/20 mix is not 80/20 after the little peat balls are dragged or mowed off. (Perhaps that loss is beneficial.) Variability here is seldom checked, making straight sand topdressing more and more palatable.

Research projects and experiences during the 1988 season have clarified a few points for 1989 consumption:

1. Regardless of the weather conditions in May and June, Summer Patch treatments should begin when soil temperature at a 2″ depth reaches 65°F. A second application should follow in a month. The Michigan State trials showed Rubigan, Bayleton and Banner to be very effective fungicides. Dr. Vargas feels that Banner may also be effective with slightly later applications.
2. Dr. Shearman at Nebraska believes that on days when it is evident that syringing will be needed, it should begin just before noon so that the water droplets on the turf will dissipate the heat via evaporation during the period when solar radiation is at its peak. This will reduce the amount of heat reaching the turf, thus minimizing heat build-up.
3. Relative humidity levels are extremely important as the temperatures rise and when the soil is adequately moist. Evaporative cooling is minimal when atmospheric moisture is high, so general irrigation may be more harmful than beneficial. Daytime hand watering (or just syringing) the high spots when needed is a better idea. Making wet soil even wetter has no cooling effect — it just reduces the soil oxygen supply. Even the most sophisticated irrigation system is incapable of solving all the water problems on undulating terrain. That's when quality **man**agement shows its value.

In the future we must give more consideration to the grass plant as a whole and its interactions with the rest of the environment. The more than we reduce any factor limiting growth, the better the turf can withstand the cultural stresses which we inflict. That future is now.