AN UNEASY FEELING

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I recently had the pleasure of listening to an outstanding presentation on the management of USGA greens. We were led through step-by-step what it takes to properly manage these greens, starting with the year of establishment. But as I listened to the recommendations and reflected back on related experiences in 1991, I began to develop an uneasy feeling—a feeling that prompted some questions in my mind. How many superintendents are aware of these recommendations and how many have the experience and resources to implement them? Do different USGA recommendations work at cross purposes with one another? How aware are we of the chemical, pedological, and microbial changes that take place in USGA greens and the consequences? Allow me to share with you what prompted these questions.

One of the first recommendations made was to pump on the nitrogen with weekly or bi-weekly applications that total 12 lb N/M or more the first year. The rates of N should be tapered off the second year and in the third year should be down to the 3 to 5 lb N/M normally applied. The rationale given for this recommendation is that this much N is required to get the bentgrass well established. The practice begs some questions. What type of root growth results? My experience is that root development will be severely reduced. If this much N is required the first year or two, why? Could it be because of another firmly-stated USGA recommendation that new greens be fumigated prior to seeding? Fumigation undoubtedly destroys the microbial population of the rootzone. Is all this N needed because time is needed to rebuild the microbial population and get biocycling of N reestablished? Is this heavy use of N at variance with environmental concerns? How much "leakage" of N takes place those first couple of years? Does someone have answers to these questions? I don't.

Another recommendation that caught my attention arises from the admission that new USGA greens are hard. Resiliency has to be created and until this is done, golfers will legitimately gripe that the greens aren't holding lofted shots. So how do you create resiliency? The answer seemed to be by prompting thatch development and covering the thatch with topdressing sand. In fact, the recommendation is to begin with bi-weekly light topdressings as soon as the greens have been mowed a couple of times. How many of you have the resources to live with bi-weekly topdressing programs and are willing to live with the inevitable wear on mowers? Is there not some other means for achieving resiliency in USGA greens?

A third recommendation that I found interesting is that USGA greens should be flushed periodically to lower soluble salt concentrations. Admittedly, this may be essential in drier regions of the U.S. where low-salt irrigation water is hard to come by. But is it necessary elsewhere and what are the environmental implications? What does flushing do in terms of N and K and pesticide losses? Does the practice have to be followed up with more N application? My guess is that it does if you don't want yellow turf a day or two after the flushing operation.

To shift gears here a bit, let me relate to you a couple of experiences from this past year with USGA greens. One has to do with soil test P levels in greens. One of my students conducted a greenhouse study that showed that if P is mixed throughout the rootzone, there is no bentgrass growth response to more than 30 ppm soil test P. In a study reported at the American Society of Agronomy Annual Meetings last fall, turfgrass growth responses to surface applications of phosphate continued up to soil test P levels of 130 ppm. Is there any wonder then why I recommend mixing in phosphate when blending rootzone mixes? Perhaps the USGA should do likewise. We all know that P promotes turfgrass root growth and split-root studies have shown that there is virtually no transfer of P from roots well supplied with P to those that are growing in a P-deficient environment. Is it possible that much of the poor root growth seen in USGA greens is attributable to low P supplies below the top inch or so of USGA greens that only receive topdressings of phosphate?

Another issue I dealt with in 1991 was signs of failure in the second year of a USGA green. The green is not draining properly and surface characteristics are those of black layer; thinning of the bentgrass and development of black algae mats. The problem seems to originate at about a 6-inch depth where pores have become blocked with fine material not originally present in the sand. This fine material is partially inorganic and partially organic in origin. Apparently this layer is restricting water and air movement such that drainage into the underlying pea gravel is severely impeded, and the bottom 6 inches of the rootzone mix have become strongly anaerobic. Exactly what chemical processes took place so rapidly to create this problem, I don't know. All I can say is that sphagnum peat moss and calcareous sand appear to have been an unfortunate choice for the rootzone mix. Yet, there are no indications from the USGA that these materials should be avoided.

My purpose here is not to take issue with the USGA Green Section, but to air some concerns that I have regarding USGA greens. Their managerial demands are high and perhaps too high for the lower budget golf courses or for less experienced superintendents. There is much to be learned yet about what chemical, physical, and microbial processes go on in USGA greens constructed from different types of sands and amendments. Until we fill in these knowledge gaps, there are going to be some very unfortunate experiences with these greens.