Avoid the Temptation of Sand Topdressing

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Many golf course superintendents are observing with great interest the experimental practice of frequent sand topdressing of golf greens. The cheaper cost of straight sand topdressing is certainly tempting when compared with some of our more commonly used topdressing materials. The choice of a topdressing mixture is no less important to the quality of a putting green than the choice of soil mixtures for new green construction. Bad decisions in either instance can lead to golf greens which are costly to manage at best or impossible to keep alive in the summer, at worst. The most expensively constructed greens, utilizing mixes specified by laboratory tests can be ruined by the improper choice of topdressing material.

Topdressing of bentgrass greens has as its primary function the "truing" of greens by stabilizing the puffy thatch layer that normally develops in a bentgrass turf. It has come to be realized that topdressing also encourages stolon rooting aids, in thatch decomposition, stimulates new shoot growth, provides microorganisms antagonistic to parasitic fungi and provides nutrients to the turf. In winter overseeding of bermuda it serves to improve seed-soil contact and enhance germination. In vegetative establishment with stolons or sprigs, it aids in rooting. In northern climates topdressing is utilized to protect against winter dessication. In situations where the existing greens soil is inadequate, frequent, heavy topdressing is utilized to actually "rebuild" or modify the existing golf green soil.

John Madison and William B. Davis of the University of California have conducted topdressing research utilizing sand materials common to the west coast and produced desirable results. The University of California guidelines suggest utilizing sand particles between 0.25 and 1.0 mm in diameter and using 1/9 cubic yard of topdressing per 1000 sq. ft. of green (about 1/30" thick) at each topdressing.[1] Topdressing frequency is dependent upon the growth rate of the bentgrass, but for calculation purposes, three week intervals between topdressings appear to be normal in their region. Pesticides, nutrients and bentgrass seed are added to the topdressing as pressures dictate. The system is apparently working well under California's environmental conditions.

There are several areas of concern that come to mind when one contemplates a change in topdressing mixtures from the traditional sand-soil-peat or weblite-soil-peat to straight sand. Some of the more obvious questions arise from our current observation of sand-peat greens and from what we know to be the characteristics of sand as a growing medium. We must assume that the end result of long term use of the light, frequent sand topdressing is a bentgrass green growing in a layer of sand. Straight sand or sand-peat mixtures have been noted to exhibit the following characteristics:

1) excessive water infiltration
2) excessive nutrient leaching
3) lower microbial activity
4) hydrophobic drying
5) lack of moisture reservoir
6) susceptibility to layering

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National Tournament Team Results

The qualifying for our team that we will send to the National Tournament has been going on now for three months. The scores for qualifying were shot at Loudon Golf and Country, Indian Springs and Hunt Valley. The best two gross scores were used and the two best scores will be our team. If the top four players are unable to attend, the alternates will be sent in their place. The results are as follows:

1st	Paul O'Leary	76-75 - 151
2nd	Jack Montecaluo	75-82 - 157
3rd	Ken Braun	79-82 - 161
4th	David Kroll	81-81 - 162
5th	Bill Emerson	76-86 - 162
6th	Bob Orazi	83-79 - 162
7th	Ron Hall	78-85 - 163

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Excessive water infiltration - The idea of improving water infiltration rates with sand topdressing is valid but one must ask where is the water going? If the 2 or 3 inch layer of sand is finally achieved after 5 or 6 years of sand topdressing, it is likely the rapidly infiltrating water is going to build up at the interface between the newly applied sand and the old soil. Will this zone become anaerobic causing death of roots in midsummer? Obviously, this is not a problem in western states where rainfall seldom exceeds 8 inches per year and irrigation is the primary source of water. On the east coast, however, we receive 40 to 55 inches of rainfall per year and it often comes in excessive spurts. Our two most popular topdressing mixtures (70% sand-20% peat-10% soil and 65% weblite-15% soil-20% peat) are providing infiltration rates around 8" per hour. A sample lab analysis of a straight sand with 95.8% of the particles between 0.25 to 1.0 mm, 1.5% silt and 0.3% clay exhibited an infiltration rate of 88.7" per hour. On the east coast where water is provided in uncontrollable amounts perhaps we are better off not having the infiltration that would come with a 3" layer of sand on top of an existing greens mixture with a considerably slower infiltration rate. Our excessive moisture is now moving off primarily as surface drainage. In situations where surface drainage is inadequate, sand topdressing is not going to solve the problem.

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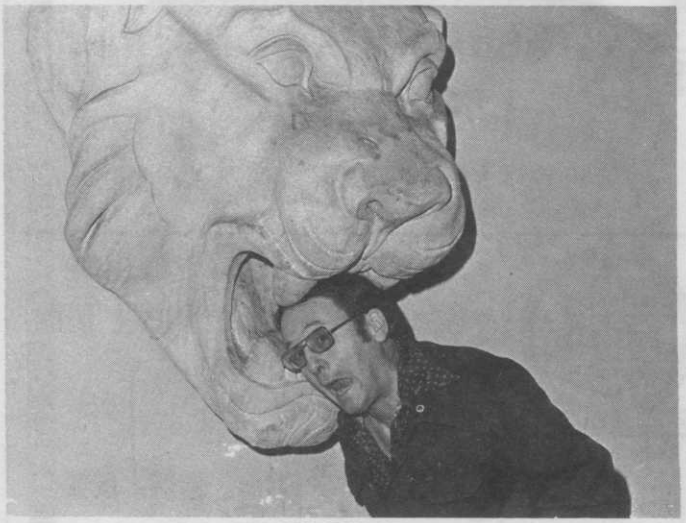
WAYNE'S PLACE



LEE DIETER

We understand that Lee Dieter has suffered from an appendicitis attack. Lee was back on the job within a week, which goes to show you can't keep a good man down. Judging from this picture Lee seems to be doing well, but the lion has gastritis.

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We hope that all of you Superintendents and your ladies will make plans to attend the 50th anniversary celebration at Turf Valley Country Club. This is the 50th anniversary of MAAGCS and Ben Stagg assures me that this will be a great night.

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Excessive nutrient leaching in the straight sand greens and sand-peat greens is consistently necessitating higher nitrogen and potassium fertilization levels except in those cases where undecomposed organic matter is used and nitrogen is released. Is building greens that require more nitrogen a move in the right direction, if we consider current and future fertilizer prices? The 1973-74 fertilizer-food shortage just gave us a "pre-shock" of things to come.

Lower microbial activity - Sand greens are likely to be less active microbiologically than mixtures containing soil. It's possible that urea formaldehyde products will be utilized with less efficiency on sand greens because of the requirement for microbiological breakdown of urea formaldehyde to plant utilizable nitrogen forms. Will thatch layers decompose slower with sand topdressing than with a mixture containing microbiologically active soil?

Hydrophobic drying has been a problem on some sand-peat greens. The formulation of water repelling organic layers on sand particles in sand-peat mixes that have been allowed to dry out have created considerable headaches. The rewetting of these hydrophobic areas is extremely difficult and has led to death of the bentgrass in some instances. Can we safely assume this won't happen in sand greens? It does not appear to be happening in conventional and sand-soil-peat greens.

A *lack of moisture reservoir* in sand and sand-peat greens is a serious concern. Water delivery systems, as advanced as they are, still leave a lot to be desired in a 3 to 5 MPH breeze. With a sand or sand-peat green one literally has no margin of error. The sand green requires constant "babysitting" to insure uniform distribution and continued replenishment of the small moisture reservoir held by the sand.

Susceptibility to layering - Two things are certain—no two golf course superintendents will run a golf course the same way and very few will stay at any one golf course more than 20 years. This creates a potential for changes in topdressing mixtures that could be lethal, especially if a sand topdressing program has been used. If a new superintendent feels the sand topdressed greens are too droughty and switches to any topdressing that holds moisture under a greater tension than the layer of topdressed sand, a false water table effect is created. The new topdressing that holds more water at a greater tension will not release it into the sand layer until enough pressure (water) is present to release the water into the larger pore spaces of the sand layer. This same problem could arise on sand-peat greens where topdressing containing soil is utilized. Percolation through this interface will likely get worse with time as the soil topdressing layer gets thicker because it will tend to retain more moisture and the false water table depth will increase. Once the layer is deeper than the aeration tines, the only sure solution is to rebuild the green.

Obviously there are a lot of unanswered questions with regard to the use of sand topdressing. Common sense tells us that if you currently have a topdressing mixture that works—don't change. Once you switch to sand topdressing, there is no turning back without considerable cost—agronomically and possibly financially.

Developing a topdressing mixture that has the right capillary and non-capillary pore space, infiltration rate, moisture retention, pH and bulk density is not an easy matter. It requires laboratory tests that are quite complicated. Commercially prepared topdressing mixtures meeting USGA specifications and complying with VPI&SU greens mixture recommendations are available. Yes, they do cost more than sand—but in the long run the cost of commercially prepared topdressing is inexpensive when compared with the costs associated with reconstructing a green or maintaining a green that has been abused with bad topdressing practices.

REFERENCES:

[1]Madison, J. H. and Davis, William B., 1977. *Problems or Progress.* Tee 2 Green Corp., 1212 W. 8th Street, Kansas City, Missouri, pp. 16.