Topdressing in Late Fall Just Before the Course Closes for Winter May Speed Spring Green-Up

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Topdressing golf greens in late fall to reduce winter desiccation and injury has been practiced by some golf course superintendents and advocated by some researchers for many years.

Although topdressing applications as light as 0.035-inch depths have been recommended for summer applications, heavier topdressings of 0.3 to 0.4 cubic yards/1,000 square feet (0.10 to 0.13-inch depths) have often been recommended for late-fall applications to protect against winter desiccation. An even heavier depth of 0.70 cubic yards/1,000 square feet (0.23-inch depth) was found to have beneficial effects on spring recovery of golf greens in Iowa, particularly during mild winters with little snowfall. In 1993 and 1994, problems in the recovery of golf greens after winter occurred at several Minnesota golf courses and appeared to be associated with topdressing practices the previous fall.

Materials and Methods

To determine whether late-fall topdressing of golf greens affected spring recovery and growth, this study evaluated the influence of topdressing depth and topdressing characteristics on soil and turf temperatures, color and injury.

Three golf courses participated in the study: River Falls (Wis.) Golf Club; St. Croix National Golf Club, Somerset, Wis.; and Indian Hills Golf Club, Stillwater, Minn. In early to mid-November of 1997, 1998 and 1999, a practice green at each location was topdressed with four different topdressing materials at two rates. Topdressing was left on the surface throughout the winter while the courses were closed. Just before the courses opened for play in the spring, the topdressing was brushed in and the grass was mowed.

Topdressing depths were 0.09 and 0.19 inch (0.3 and 0.6 cubic yards/1,000 square feet); control plots received no topdressing. Each of the four materials was applied at each depth.

The topdressing materials were: silica sand; masonry sand; 85 percent silica sand/15 percent peat mixture (by volume); and 85 percent masonry sand/15 percent peat mixture (by volume). The silica sand was white, rounded with medium sphericity shape, and very uniform in size (1 percent very fine sand/6 percent fine sand/90 percent medium sand/3 percent coarse sand by USDA soil classification). The masonry sand was commercially screened specifically for the needs of the golf course industry and was brown, subangular with medium sphericity shape, and less uniform in size than the silica sand (1 percent clay and silt combined/1 percent very fine sand/24 percent fine sand/46 percent medium sand/26 percent coarse sand/1 percent very coarse sand). The peat used in both sand/peat mixtures was a shredded and milled reed-sedge peat with an organic content of 80 percent by weight.

In the spring, after snowmelt, turf surface temperatures were measured using an infrared thermometer; soil temperatures were measured in the surface 2 inches of soil; turf color was evaluated on a 1 to 9 scale; and visual observations of turf damage were noted.

Results

Because recovery from winter and response to topdressing treatments may be influenced by late-fall, winter or spring weather conditions, it should be noted that winter temperatures were considerably above normal all three years of this experiment. Unusually warm temperatures in November and December 1998 and 1999, averaging 7.2 F above normal, resulted in little or no snow cover during most of those months. Warm temperatures in February and March all three years, averaging 10.0 F above normal, provided earlier than normal snowmelt.

Temperature

Topdressing with white sand decreased turf surface temperatures compared to no or darker-colored topdressing. In spring 2000, the lightest-colored treatment resulted in the lowest temperatures (silica sand, heavy rate). The darkest-colored treatment (masonry sand/peat, heavy rate) lead to the highest temperatures. The control received no topdressing.

Differences were greatest soon after snowmelt and diminished with turf growth, brushing in of topdressing materials, and mowing. Surface temperatures were also affected by daily factors such as cloudiness (surface temperatures would change by several degrees as small clouds shaded the plots from sunlight for even a few minutes) or rain (all three courses received rainfall during the night before the March 24 measurement, leading to insignificant differences between plots).

Soil temperatures in the surface 2 inches were measured weekly during spring 2000. Differences between treatments paralleled closely the differences in surface temperatures with silica sand, heavily topdressed, having the lowest soil temperatures and masonry sand or masonry sand/peat topdressings leading to the highest temperatures early in the spring. The magnitude of temperature differences narrowed quickly, but slight differences still existed on April 14, even though plots had been brushed and mowed.

Both surface and soil temperature results suggest that the color of topdressing material determined its effect on spring

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Topdressing–

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temperatures. Although it was not the only important factor, the higher spring temperature of some plots probably led to differences in early spring growth as indicated by turf color measurements.

Turf Color

Early spring color was significantly better on plots topdressed with masonry sand, masonry sand/peat, or silica sand/ peat than on plots topdressed with silica sand or control plots with no topdressing. The differences in color were visually dramatic for several weeks as most topdressed plots turned green and started growing while untopdressed plots remained brown. Differences in color were evident for approximately four to six weeks after snowmelt in the spring.

The enhanced early color of plots with darker-colored topdressing was likely due to a combination of reduced desiccation and higher temperature effects. Plots topdressed with white silica sand had lower temperatures, which probably slowed the initiation of spring growth as compared with plots topdressed with darker materials. Plots receiving no topdressing were nearly as warm as plots topdressed with darker materials, but they were particularly slow to green up in the spring, presumably because of greater plant desiccation during the winter.

Turf Damage

Observations of injury seem especially pertinent to golf courses. Even occasional damage may create unacceptable risk for management practices. Four types of turf damage were noted on plots in this experiment. In all cases, damage refers to areas where turf did not come back after the winter.

Damage occurred every year to an area of about 10 square feet at one golf course. This damage was in an area where ponded water remained on the surface after free water had left the rest of the plot area during snowmelt periods. At the same course, in the first spring, damage was apparent on all plots regardless of topdressing treatments and was probably related to excessive surface water during the snowmelt period. In both cases damage appeared unrelated to the topdressing treatments, but the treatments did not help turf survive what was, in all likelihood, damage from excessive surface water.

During the first year of the experiment, damage to turf was evident along the edges of plots at two courses where topdressing treatments overlapped. At these courses, plots were 4 feet wide in order to fit all plots onto the greens. Topdressers spread material at a width of 4.5 feet, leading to a narrow overlap strip at the edges of plots. At both sites there was turf damage in the spring on some overlap areas, and damaged areas were visible for several months because the turf was thin. Although these areas were not part of the designed experiment, they demonstrated that excessively heavy fall topdressings can lead to turf damage. Because of damage to overlap areas, plots at these sites were widened to 4.5 feet during the second and third years of the experiment.

In one year, turf damage at one site was clearly related to topdressing treatments. Damage was obvious and limited to about 5 to 6 feet at one end of the plots. In one replication, obvious damage occurred on three of four heavily topdressed plots: silica sand, silica sand/peat mixture, and masonry sand/peat mixture. Slight damage was noted on the heavily topdressed masonry sand plot. In the other replication, slight damage was noted on the heavily topdressed silica sand and silica sand/peat mixture plots. No damage was noted on the lightly topdressed or control plots in either replication. The damaged area at the end of the plots was the wettest part of the green and an area where snow remained the longest. No damage was noted in this area during the other two years of the experiment. It appears that heavy topdressing may increase problems in turf recovery from winter where greens are subject to excessive surface wetness.

Conclusions

Late-fall topdressing of golf greens with sand or sand/peat mixtures significantly affects spring turf growth. Compared to plots without topdressing, topdressed plots were quicker to green up in the spring. Topdressing with white sand led to cooler spring turf and soil temperatures than topdressed plots, but spring green-up was still somewhat enhanced by the topdressing. Topdressing with darker-colored materials (brown sand or sand/peat mixtures) led to the warmest spring temperatures and the earliest spring green-up and growth. Superintendents who want to use light-colored sand but also get early spring growth might consider mixing peat with the sand to darken the color.

Topdressing at a rate of 0.19-inch depth (0.6 cubic yards/1,000 square feet) led to early spring growth but was associated with some damage at one site in one of the three years of this experiment. This result suggests that heavy topdressing may increase damage when excessive surface moisture occurs. It seems appropriate to limit late-fall topdressing depths to no more than about 0.09 inch (0.3 cubic yards/1,000 square feet). Topdressing at this rate and with darker-colored sands or sand/peat mixtures should help reduce desiccation and promote an early start to spring growth.

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