



# Refining Your Putting Green Topdressing Program

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**G**olf course superintendents are often eager to discuss their thoughts on fertility, diseases, weed control and any number of other management issues. One management practice, however, that seldom arouses much spirited discussion is topdressing. This is interesting, since topdressing is such an essential practice that can produce great benefit if done properly or may cause great problems if done improperly.

Since the early 1900s, golf course superintendents have recognized the importance of topdressing in maintaining putting green turf. Proven benefits of a sound topdressing program include a smoother putting surface, finer-textured turf, reduced grain and enhanced thatch control. If a properly chosen mixture is used, topdressing can also provide a rootzone that resists compaction. A sound topdressing program can be used to gradually, over time, modify a poor rootzone mixture and improve water infiltration.

Most superintendents today use a program of light, frequent topdressing on their greens, but many are unaware that this system is relatively new to golf courses. Until the late 1970s, most bentgrass putting greens were topdressed only twice per year, in the spring and fall, at heavy rates following aeration. The primary purpose of this heavy topdressing was to fill aerator holes and provide a smooth surface free of the bumpiness of non-topdressed greens. Since bentgrass greens were not aerified during summer, no topdressing was done over the three- or four-month summer period. This established system of heavy spring and fall topdressing changed, however, due to the work of Dr. John Madison of the University of California at Davis.

## *The "new" way to topdress*

In 1958, Dr. Madison received a large shipment of compost for testing. A load of that compost was dumped adjacent to a test plot of bentgrass. The evening sea breezes continuously blew very small amounts of sand across the corner of an experimental putting green at their facility. Over a period of two years, Madison noted that the area of the green that had received this light, frequent topdressing had a firmness and quality superior to the other portions of that same green. Thinking that he might be onto something, Madison continued to experiment with this topdressing concept for years. In 1974, he proposed a radical new system of topdressing, one which led to the current topdressing practices used by virtually every superintendent today.

Madison and his associates proposed a program consisting of light, frequent topdressing with a sand in the 0.05 to 1.0 mm range with at least 75% being fine and medium sand. Sand containing no organic matter was applied about every three weeks at a rate of three cubic feet per 1,000 square feet. About 15 applications at 1/28" per application were made during the season.

When he first proposed this new topdressing system, Madison thought that if correctly sized sand was used, compaction would

be eliminated as well as the need for aeration. He envisioned a greens management system that consisted primarily of mowing, topdressing and watering. Madison proposed adding seed, fertilizer, pesticides and other materials to the topdressing as needed, thus eliminating fertilization and spraying as we know them. Eventually he came to see these additions as impractical in a routine management system, but his basic idea of light, frequent topdressing has become the industry standard.

## *Topdressing practices today*

The vast majority of golf course superintendents today make light, frequent topdressing applications to their greens. In developing a sound topdressing program, many major variables must be considered. What is the right sand size to use? Should organic matter be added to the sand? How much topdressing should be applied per application? How frequently should the green be topdressed?

## *What is the right sand size to use?*

It is rare these days to find a new golf course where the putting greens have not been constructed using a USGA-recommended rootzone mixture. In addition, many existing clubs go to a great deal of expense, and endure considerable inconvenience, to rebuild their putting greens to USGA specifications. This is because superintendents realize the importance properly sized sand in providing optimum rootzone conditions.

It is important to keep in mind, however, that in five to ten years, most of the root system will be growing in the topdressing mixture that has accumulated over the years, not in the original rootzone mix. Thus, choosing an excellent topdressing sand is every bit as important as choosing the proper mixture for the original putting green construction.

In most cases, optimum results will be obtained by using a topdressing sand closely adhering to USGA recommendations for rootzone construction. This requires that at least 60% of the particles should be medium and coarse sand (0.25 - 1.0 mm diameter). A mixture consisting mainly of medium and coarse sand will ensure that the green contains a good balance between macropores and micropores. Macropores (large pore spaces) are important for providing rapid drainage following heavy rains, and micropores (small pore spaces) help to hold moisture and prevent an excessively droughty soil. Assuring that the sand chosen contains mostly medium- and coarse-sized particles is the first step in assuring a good topdressing material.

Less than 10% of the sand should be very coarse (1.0 - 2.0 mm). Very coarse sand particles produce excessively large pores that contribute to a droughty rootzone. These large particles are also difficult to work into the turfgrass canopy, particularly on the newer fine-textured bentgrasses, and they can dull mower-bed knives and reels.

It is also important to limit the amount of very fine soil particles (clay and silt) in the mixture as these particles can clog pore spaces and greatly reduce the infiltration rate of the rootzone. No more than 10% of the total mixture, by weight, should consist of silt, clay and very fine sand (particles less than 0.002 - 0.15 mm).

The clay portion of the mixture should be less than 3% by weight, while the silt and very fine sand components should each make up less than 5% of the mixture. Even though the amount of these smaller sized particles should be limited, they should not be eliminated entirely, however, since the clay particles in particular contribute some nutrient-holding capacity to what is an inherently infertile system.

### *Should organic matter be added to the sand?*

Ten to twenty years ago, superintendents were divided on this point. Some favored adding an organic matter source to the topdressing sand, and some did not. Today, however, it is difficult to find many superintendents who use a mixture containing organic matter. By far, most use a sand-only mixture.

Many feel that since one of the main objectives of topdressing is to reduce excessive organic matter accumulation (thatch) on

greens, why add organic matter with topdressing? Adding organic matter also makes for a more expensive product, and occasionally the organic matter will separate out from the mixture following a hard rain. Straight sand mixes also flow better and are easier to keep dry for proper application. If a properly sized sand is chosen, addition of organic matter or other inorganic amendments is probably unnecessary in most situations.

### *How much topdressing should be applied per application?*

The basic rule of thumb for determining the proper application amount is that all of the applied topdressing should disappear into the canopy after a light brushing or irrigation. In general, a rate of 3 to 5 cubic feet of sand per 1,000 square feet works well and is a good range to begin with.

Of course, the best rate for topdressing will vary from course to course, depending on the cultivar being grown, as well as the overall green density. Greens that have recently been verticut, or which are not very dense, may accept close to 5 cubic feet per 1,000 square feet, while very dense greens such as the 'A-4' or 'G-6' varieties are often too dense to accept 3 cubic feet per 1,000 square feet.

Application rate and frequency are related, in that lower application amounts are generally chosen if topdressing is done more frequently. It is important to match the amount of sand applied to the growth rate of the grass. The purpose of a light, frequent topdressing program is to constantly add a small amount of topdressing to the green surface. Applying too much sand per

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application results in a surface that may play fast and smooth but visually appears less dense. Of course, much larger quantities of material will be needed following aeration in order to fill up the holes and provide a smooth surface.

Some superintendents verticut greens at the same time they aerate, prior to topdressing. Verticutting allows the large amount of sand needed to fill the aerator holes to be worked more easily into the turf canopy between the holes. This reduces the amount of brushing needed to work in the topdressing.

#### How frequently should the green be topdressed?

A pure sand topdressing mixture does not add microbes that decompose thatch. It does help prevent thatch, however, by constantly diluting the organic matter being produced so that a thatch layer never gets the chance to form. Thus, it is important to match the frequency of topdressing with the growth rate of the grass so that alternating layers of thatch and topdressing do not form. (Figure 1). Alternating layers of thatch and topdressing drastically inhibit water movement through the profile and may inhibit rooting.



Figure 1.



Figure 2.

The goal of a light, frequent topdressing program is to produce a uniform non-layered rootzone favorable for root growth (Figure 2). Keep in mind that using a frequent topdressing program can add 0.5" to 0.75" per season to the rootzone depth.

In general, most superintendents topdress once every two to three weeks. Some topdress every week, and some topdress only monthly, but every two to three weeks is a good frequency to begin with. Bentgrasses will require the most frequent topdressing during spring and fall, while bermudagrass growth during summer will require more frequent topdressing than during the slower growth portion of the year.

Be especially cautious when topdressing bentgrass greens during summer. Creeping bentgrass is usually already stressed in summer, due to high temperatures and disease pressure. Applying the topdressing itself is not so damaging to the grass, but the brushing needed to work the material into the canopy can cause severe abrasion to the grass. This can result in leaf-tissue damage, yellowing and greater water use by the plant. Very light rates of topdressing followed by irrigation and minimal brushing are desirable to reduce potential damage during the summer.

#### Summary

Topdressing is an important but often neglected aspect of putting green management. If you haven't

reviewed your topdressing specifications lately, do it soon to assure that you are using a material with the proper particle-size distribution. Applying the proper rate of a good material at the proper frequency will result in firm, smooth, thatch-free greens that contribute to a high-quality playing surface. 🌱



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