

PROS AND CONS OF FREQUENT SAND TOP DRESSING

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Excellent putting greens don't just happen. They are the end product of a professional turfgrass manager. Each of us has played on greens which, at the time, were near perfect. Constructing varies from pure sand, to pure clay. Some are solid stands of Penncross or Seaside, others pure Poa. Many are aerated frequently, some only once a year. Some are played every day, while others are open less than 6 months a year. Frequency of play varies from a few players each day to more than 200 golfers daily. Because of this great variation in use, existing conditions, and micro and macro climates, the answer to excellent greens has to be the professional superintendent. He must be a problem solver, not just a schedule maker and ramrod of a maintenance crew. It is to the professional that I wish to direct my thoughts and information on topdressing. This key management program to excellent putting golf greens is possible if you can put the pieces together.

There is nothing new about the concept of topdressing. Since the beginning of golf course management, it has been a common practice. Topdressing is a necessary practice to improve the trueness of a putting surface. It also seems to invigorate and improve the growing condition of grass. In part, this may be due to the fertilization and/or aeration which usually accompany topdressing. For many years the standard practice has been to aerate and topdress twice a year, although many may aerate six times per year. Light frequent topdressing as a major component of the putting green management program has been practiced on few courses.

Several factors led us into the study of topdressing as a major management program for achieving high quality putting surfaces:

1. Through previous research and field experience, we learned that a medium-fine, narrow particle size range of sand made an excellent growing medium.
2. These types of sands were relatively noncompactible.
3. They produced a stable firm surface.
4. They accepted water at relatively high rates.
5. They retained moisture in the root zone as well as most mixes presently used for golf greens.
6. Their nutritional problems were no more difficult to solve than those of the various soils and mixes commonly used.
7. With the right sand, they were easy to apply and work into the surface of the growing grass.
8. There was no need to amend these sands to make a topdressing mix as the putting green grasses produced more organic matter than needed.

One major problem with any new program is how to get it accepted, if it is likely to increase labor and material costs. To avoid this problem, we decided to eliminate aerating and verticutting from our basic experiments. Thus, the total time expended on green management would remain about the same. We also decided to premix fungicides, herbicides, fertilizer and bentgrass seed into our topdressing sand. Our green management practices for greens, consisted of mowing, irrigating and topdressing. It worked for us, but from a practical field operation, the premix of chemical and fertilizer posed many problems. Added

chemicals and fertilizer were not always needed. During periods of very little growth, fertilizer was needed, but the addition of sand was not. Once herbicides and fungicides were added to a sand, the topdressing material had to be handled, stored, or disposed of under EPA regulations.

The basic experiments were done on our campus experimental green. We also experimented on various practice greens using pure sand at different frequencies and amounts coupled with aerating frequency. The results from these experiments are published under the title "An Alternative Method of Greens Management." We have continued to field-test the program and work with superintendents, to solve their problems in making frequent light topdressing a viable management program.

A key question to be answered in our research was whether frequent topdressing could be an effective method for controlling accumulation of thatch. Would it enable us to get away from the problem caused by buried thatch layers which impede water movement and restrict depth of rooting? Would it create a uniform growing medium and aid in the breakdown of this organic matter? We need a vigorous renewing turf to have a putting surface. On many greens, vigorous turf also produces excess thatch which gives an untrue surface, increases disease potential, and reduces the fastness of the green. Therefore, frequent light topdressing could solve many of our problems in maintaining a high quality putting surface.

Experimentally we proved what we believed to be true, although, the real value of any experimental work is its application to the field. Therefore, let us look at a range of field questions and their possible answers:

1. Q. Will just any sand or topdressing mix give basically the same results?

A. No, for several reasons. Coarse sand particles do not work into the surface grass readily. Golfers do not like to putt on greens which have just been topdressed. Coarse sharp sands dull mowers and are abrasive to the grass. Sands which are too fine can seal the surface of a green and reduce infiltration.

2. Q. What type of sands do you recommend?

A. A relatively fine narrow range of particle size. Round sand particles are best. Table 1 gives the particle ranges we presently suggest for construction and topdressing. Table 2 shows several sands now used by some California golf courses.

3. Q. Are suitable sands readily available?

A. Yes and No. For the past 10 years we have tested sands from many areas of our state as a service to golf course superintendents. We find them in coastal deposits and dredge them from the San Francisco Bay. Some come from deposits on individual golf courses, and others from many and varied river deposits. Sand companies now produce what we want, because we have specified the grade of sand we desire and will no longer buy their standard grades. Most major sand suppliers can screen and wash to a specific grade range if you create the demand and will not accept second best.

4. Q. Do you mix any amendments with the sand?

A. No. Amendments must be uniformly and evenly mixed if they are to measure up to their potential. This greatly increases the cost of the topdressing medium. Topdressing is difficult to apply when moist. The mixes separate when dry. Sand and organic mixes become thin layers of organic matter and sand by the time they are brushed and irrigated into the turf surface. Very fine organic matters can seal the surface. Coarse organic matter does not readily work down into the grass. Most greens are producing more organic matter than we want, so it is not

necessary to add more.

5. Q. How frequently do I need to topdress to achieve the maximum benefits of this type of topdressing program?

A. How fast is your grass growing? It is very likely that 20 applications a year (year-around play) would be too many. Fifteen applications was just about right for our Penncross green. At some periods of the year, topdressing every 2 weeks is just right, but you may well go for 8 weeks between some applications.

6. Q. Can I apply topdressing too frequently?

A. Yes. It is important to maintain some organic cushion. Excessive turf damage can result from ball marks where sand is applied too frequently and/or too heavily.

7. Q. How much sand should I apply at each topdressing?

A. Assuming your only objective is topdressing and not quick buildup of a new surface, you should be applying 1/32 to a maximum of 1/16 inch.

8. Q. How do I apply such small amounts?

A. It takes good equipment and a skilled operator. Topdressing machines set at almost closed application settings have done a good job. Some superintendents have found broadcast fertilizer equipment to be the answer.

9. Q. Can these uniform medium fine sands be applied at the higher rates typically used when aerating and topdressing once or twice a year?

A. No. These finer sands are not as easy to move and push around over the green. If heavy amounts are desired for some specific reason, it would be best to make several uniform fine applications.

10. Q. Do you tend to build up the depth of the green much faster than typical aerating and topdressing practices?

A. There is very little difference. At the frequencies which produced our best putting surface, the difference was less than 1/4 of an inch per year, when compared to standard practice. On golf courses, we have not seen an observable difference.

11. Q. Do you recommend limiting aeration and verticutting altogether once you start a topdressing program?

A. No. The condition of your present green will, in part, govern how fast topdressing can become a major management program. It is best to increase your aeration at first in order to insure a good transition between your old and new surface. Many superintendents have found that a double aeration and/or deep aeration work best. During the first year, some courses have gone from two basic aerations to a maximum of six. Five-eighth-inch tines are used to start, then only 1/2- or 1/4-inch tines. Their topdressing might be much heavier at first, but they are soon on the 1/32- to 1/16-inch application rates. Verticutting may or may not be used. Many superintendents have found it beneficial with present day equipment.

12. Q. Once on the program, is aerating completely eliminated?

A. No. But we no longer use aeration as our basic and most effective means of relieving compaction and removing thatch. Once we have a new uniform surface with a depth of 2 to 3 inches, late spring and/or early summer aeration may be in

order. Even though we do not have a buried thatch layer, we may want to reduce the density or firmness of the surface. Verticutting the plugs on the green will separate the sand from the organic matter. By removing the organic matter and brushing the sand into the green, you will have topdressed without the need for adding extra sand. Some superintendents feel that of their 12 to 18 topdressings per year, 2 or 3 of them would be verticutting their aeration plugs.

13. Q. If you aerate, aren't you opening up the green for greater Poa annua invasion?

A. Yes and No. It depends on the time of year. We recommend only aeration in the late spring and early summer when Poa annua germination is at a minimum.

14. Q. How long before a topdressing program will make a major difference in the surface of the green?

A. Again this depends on the condition of your green when you start the program and how soon you are developing a uniform surface. Considerable improvement has been noticed in greens before the end of the first year. More typically it takes about 18 months.

15. Q. Will your golfing membership like the new green surface?

A. Maybe yes - maybe no. If your golfers want a true firm green, the answer will be yes. If they expect a poor shot or an improperly played shot to stick on the green, they will be unhappy. Some players will have to take a few golf lessons and learn how the game is played.

16. Q. Can this program be easily incorporated into my present management program?

A. Yes. But it is a poor practice to go into any new program without first testing it out on your practice green. Your sand source is critical. Do you need new storage bins for your sand? Do you need to relocate or add sand storage bins in order to reduce the time it takes to move sand to your greens? Is your present topdressing equipment in excellent condition and will it apply evenly the right amount of sand? Does your crew know what is expected from the program and what it must do to make it work?

No doubt, there are many other questions we might ask and answer. In this paper, they should be unnecessary because this program is for the professional superintendent. The true professional can make it work and results will be quite predictable. Tournament golf every day is possible. Less reliance on fungicides and herbicides is possible. You may also find the height of cut might well be increased and frequency of mowing reduced. If the primary function of your putting green is for putting, a properly developed topdressing frequency program could be the answer to great golf for your members and fewer problems for you.

TABLE 1: Suggested Particle Size Ranges for Sand
Used in Golf Green Construction and Topdressing

SIEVE OPENING mm	U.S. STANDARD SIEVE NO.	U.S.D.A. CLASS	CONSTRUCTION DESIRED	CONSTRUCTION ACCEPTED	TOPDRESSING DESIRED	TOPDRESSING ACCEPTED
2.38 2.00	8 10	FINE GRAVEL				
1.68 1.41 1.19 1.00	12 14 16 18	VERY COARSE SAND		0-10%		
.841 .707 .595 .500	20 25 30 35	COARSE SAND	0-15%	80-90%		0-15%
.420 .354 .297 .250	40 45 50 60	MEDIUM* SAND	80-95%		100%	75+%
.210 .177 .149 .125 .105	70 80 100 120 140	FINE SAND				
.088 .074 .063 .053 .044	170 200 230 270 325	VERY FINE SAND	4-8%	5-10%		0-8%
.037	400	SILT & CLAY				

The proportions proposed are tentative guidelines only. Individual sands should be considered in terms of infiltration rate when compacted and the moisture release curve. These will be affected by the particle size distribution within the limits proposed. The shape of the sand particles also must be considered, as round sand particles do not compact as readily as sharp sand particles.

*The key fraction is the medium sand. It should be the dominant fraction.

TABLE 2: Particle Size Distribution of Some Recommended Sands Being Used on Northern California Golf Courses

Source	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	Center* Three Fractions
Dillon Beach	0.0	0.3	2.3	68.3	24.6	0.9	0.8	2.8	95.2
Antioch Fill	0.0	0.1	1.0	71.6	21.7	1.2	1.6	2.8	93.3
Guadalupe	0.0	0.0	0.9	76.6	17.9	0.2	0.0	4.4	95.4
Brown Manteca	0.3	4.1	28.5	42.9	22.3	1.4	0.2	0.4	93.7
Santa Cruz 1070	0.0	0.0	11.3	62.5	23.2	1.0	1.5	0.5	97.0
Coloma Sand	0.9	0.3	17.5	52.9	23.0	0.8	1.3	2.0	93.4
Lappis #10	0.0	0.0	19.2	75.3	4.1	0.0	0.7	0.7	98.3

*Note that the center three fractions of each of these sands is greater than 90% retained and that the dominant fraction is medium (0.50 mm to 0.25 mm).