

USGA

Rebuilding Greens - The Journey Continues

By Pat Gross

Part I - Selecting the Organic Matter

Last month, we discussed the first and most important step of developing a root zone mix, the selection of sand. The next step is selecting an appropriate organic matter to blend with the sand. Some people question whether organic matter is even needed in the root zone mix, saying that it is too expensive and that several courses have successfully built greens without the addition of organic matter. While this may be true in some cases, there are several good reasons for including organic matter in the root zone mix. First, organic matter increases the nutrient holding capacity and moisture retention characteristics of the sand. This is very important from an environmental perspective to prevent rapid leaching of nutrients applied to the turf. Second, the addition of organic matter reduces the bulk density of the Mix. Other benefits of using organic matter include

improved green-up and establishment, better rooting stability and wear tolerance, improved gas exchange, and increased microbial activity. Actually, the addition of an organic amendment is most critical during the first few years of establishment until the turfgrass stand can generate its own organic matter through normal decomposition of roots, stems and clippings. As a comparison, the greens I have seen grown on pure sand experience significant problems during the first few years including rapid thatch accumulation (no microbial activity to break down the thatch) and they need a tremendous amount of fertilizer to sustain active growth. In my opinion, the cost of adding organic matter to the root zone mix is minimal and will give you a healthier green with fewer inputs.

Organic matter sources - The most common organic amendment is peat because of its availability and high organic matter

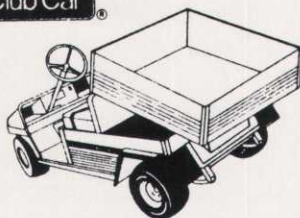
content. There is a wide variability in various peats depending on the source of the peat, degree of decomposition, pH, ash content, and moisture content. These factors can influence the performance of the root zone mix depending on the characteristics of the sand selected for construction. There is no way to determine the suitability of a particular peat or other amendment by simply looking at it - laboratory testing is a must! Other organic amendments have been used successfully including rice hulls, sawdust, and bark products. The only caution here is that the materials must be adequately composted through the thermophilic stage (when the compost pile gets very hot) to the mesophilic stabilization phase (when the pile cools off). All of these materials can be used successfully, but the bottom line is to have the materials tested by the laboratory to see which one works best

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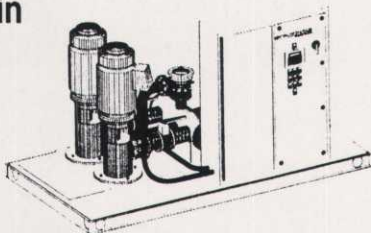
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Rebuilding Greens (Cont.)

in your sand.

Weight or Volume? - Most people still describe root zone mixes on a volume to volume basis such as a 90:10 mix or 80:20 mix. One of the most significant changes to the 1993 USGA Recommendations for Putting Green Construction was the requirement that the labs report the percentage of organic matter by weight. This is more precise because the volume of a peat or other organic source can be distinctly different due to particle size, density, and how it was handled. It was far more difficult to get an accurate measurement on a volume basis because you never knew if the organic matter was measured in a compressed state or fluffed up. Also, an 80:20 mix with fir bark may end up having the same amount of organic matter as a 90:10 mix with Sphagnum peat. As you can see, this led to much confusion. The new recommendations suggest an organic matter content of 1 to 5 percent by weight determined by loss on ignition. Burning the peat determines the actual organic matter content aside from any water or soil that may be in the peat and gives a more precise measurement. Once again, have the material tested by a physical soils testing laboratory.

What Material do I choose?

- Some people may have the luxury of choosing from several good locally available organic amendments. In this case, you want to verify the quality and consistency of the product, and test the material for compatibility with your sand. After the laboratory has done some performance tests, it may be easier to see which material gives you the desired results at an economic price.

Pitfalls - Some of the common pitfalls associated with the organic component of the root zone mix involve the handling and mixing of the material with the sand. Sometimes a sample of the organic matter will be sent to the lab for testing without being fluffed or shredded the same way it is during mixing. The handling procedures and degree of shredding can have a significant effect on the particle size of the amendment, and this will influence the performance of the mix. Be sure to talk with the laboratory and the blender to be sure they are handling and mixing the material in a similar fashion. Also, have the laboratory and the blender discuss the moisture content of both the sand and organic amendment since this directly effects the

relative weight measurements. The other common mistake is bucket mixing or trying to rototill the amendment into the root zone. I have one simple recommendation - **DON'T DO IT!** I made this bonehead mistake several years ago while constructing a putting green nursery. That poor course is still living with fudge marble layers in the

root zone because of my error. Have the materials mixed off site by a reputable soil blender and you will be more assured of getting a homogeneous mix.

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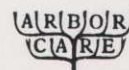
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