

Water Conservation / Optimizing Hydraulic Conductivity

The organic matter content of soil has a direct relationship to the soils ability to hold and retain water. For example, soil scientists report that for every 1% of organic matter content, the soil can hold 16,500 gallons of plant available water per acre of soil down to one foot deep (source: ATTRA). Golf courses can take advantage of this relationship to find significant savings on the cost of water used for irrigation. However, golf course superintendents need to closely watch the impact of soil organic matter on hydraulic conductivity or infiltration rate so that members can play golf not too long after rain events.

When increasing organic matter content of soil so as to raise water holding capacity, it is important to use compost that does not adversely infiltration rate. Compost that is made from pure wood (in the form of sawdust or ground wood screened to 3/8"minus) and biosolids is the highest quality and most versatile compost available. Similar to peat, it increases water holding without a significant effect on infiltration rate.

The addition of other ingredients in biosolids compost such as wood ash and short paper fiber (a source of clay particles) may slow infiltration rate due to the high amount of fine particles contained in each. As shown below, those composts with increasing concentrations of silt/clay content have a significant effect on infiltration rate when used in an 80:20 sand:compost mixture. The data show how seemingly small increases in silt/clay content can have a dramatic effect on infiltration rate.

Comparison of Silt/Clay Content in Sand-Based Root Zone & Effect on Infiltration Rate

	SILT/CLAY CONTENT (%)	INFILTRATION RATE
Compost A	4.4	16 in/hr
Compost B	6.8	12 in/hr
Compost C	7.5	4.6 in/hr

When using compost in sand-based root zone mixes care should be taken to examine the composition of the compost. Testing of water infiltration rates is a valuable method to insure that a proper mixture is obtained.