

Why Is Organic, Our Best Friend, So Misunderstood.

By Dave Doherty

Organic matter, Mother Nature's wonderful gift, is often viewed as public enemy number one by the sports turf industries. Organic matter, naturally produced by a grass plant in the upper two inches of the root zone can be our best friend when it comes to maintaining a healthy turf. Organic matter provides three very important elements contributing to plant health.

1. Organic matter will hold water/retain moisture, which plants need to cool themselves in times of stress.

2. Organic matter contains cation exchange capacity. "Soils can be thought of as storehouses for plant nutrients. Many nutrients such as calcium and magnesium, may be supplied to plants solely from reserves held in the soil," says David B. Mengel, department of agronomy, Purdue University.

"Others like potassium are added regularly to soils as fertilizer for the purpose of being withdrawn as needed by crops. The relative ability of soils to store one particular group of nutrients, the cations, is referred to as *cation exchange capacity* or CEC."

3. Organic matter provides food for soil life. "Soil microbes play key roles in ecosystems and influence a large number of important ecosystem processes, *including nutrient acquisition*," the Ecology Letters, explained in 2008.

My early research into the failure of turf grass on golf greens has shown that the number one cause of greens failure was an *excessive* amount of organic matter in the top inch of the soil profile. Continuing research into excessive organic matter shows that organic matter in excessive amounts had a direct relationship with the amount of air pores existing in the root zone.

For example: Three percent organic matter in a root zone with 25 percent air pores proved to be very healthy and a benefit to plant health. However three percent organic matter in a root zone with 12 percent air pores proved in many cases to cause extreme plant failure. Pores are best described as the space between the solids.

A root zone is made up of 3 elements: Solids, air pores and water pores. Roots of turf plants can only live in *air pores*. They cannot live in solids and they cannot live in water pores.

Roots from a grass plant can only exist in air pores because it is these air pores that supply the oxygen that root systems require for sustainable plant health. Organic matter, deposited by the roots ends up in the air pores because roots only live and exist in air pores.

Over time the organic matter can build up and decrease the amount of oxygen available to the plants. When a turf plant does not have enough oxygen to breath freely it

becomes weak and susceptible to many diseases. This lack of oxygen also leads to greatly diminished microbial populations resulting in poor soil balance.

What we have learned from this research that started in the early 1990s and continues today, is that a balance between air pores and organic matter is essential and the number one element that must be maintained to have a healthy plant and reduce our dependency on chemicals.

When my work in the early 1990s became available to the sports turf industry there was an immediate knee jerk reaction that 'O my goodness' organic matter is bad and we must eliminate it.

Many golf course architects started recommending that greens be made out of soil mixes that were very low in organic matter. Superintendents battled these almost sterile greens mixes. With time and patience we've been able to overcome this lack of organic matter and nurse these greens into maturity. The plants have been allowed to build up organic matter and convert these sterile greens mixes into well-balanced soils.

Organic matter is not our enemy and is in fact one of our best friends. We just need to keep organic matter and air pores in balance, which we can do with regular soil physical properties testing.

The days of we as an industry aerifying and applying products, without first knowing what the soil consists of, are dead. To be environmentally and agricultural sound we must first find out what the soil needs and then act accordingly.

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