

Wetting Agents

How do they do what they do?

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Without water, none of us in this business would have a job in Colorado.

Most of us are constantly trying to develop ways to irrigate our turf. Some of us reduce the amount of irrigated turf, or install more efficient irrigation systems; most of us pay close attention to soil moisture and plant stress, trying to minimize the latter by applying the least amount of water. And I would bet that EVERYONE uses wetting agents somewhere on the golf course, if not everywhere on the golf course. Have you ever thought about how wetting agents actually allow you to irrigate more effectively?

Water is a truly unique compound. Individual water molecules have a strong attraction for each other due to their similar nature (remember that from high school and college chemistry?) But water molecules are also strongly attracted to other things in nature, like clay, silt and organic matter. This attraction is what allows soil to hold water for plant use. Water is not strongly attracted to individual sand grains, but rather to the small pores between sand grains of appropriate size (hence the USGA greens mix.)

The strong attraction that water molecules have for each other is especially apparent when water is sprayed on a hydrophobic (water-repellent) surface, such as a newly waxed car or on a plant leaf. In both cases the waxy surface actually increases the attraction of water to itself (surface tension), causing the water to "bead up" and preventing it from spreading evenly over the surface. Unfortunately for turfgrass managers, similar hydrophobic conditions can develop in soils, preventing irrigation and precipitation water from moistening soil uniformly. This is why we get hydrophobic soils, thatch and isolated dry spots.

In other situations we encounter stratified layers in root zones, the result of changes in philosophy regarding top dressing materials and/or frequency. Water has a difficult time moving between adjacent layers of sand, thatch, soil, peat, and sand again, thatch again, and so on. You get the picture. . . The time honored, field-proven, method of dealing with these problems is the use of wetting agents. A wetting agent is simply a surfactant (or surface-active agent), a material that reduces the attraction of water molecules for each other. This action allows the water to spread out more evenly on hydrophobic surface, so move more quickly through small pores, and to move more effectively across "boundaries" (like those layers in your greens and tees.) As a point of caution, it is important that wetting agents not be considered "miracle cures".

They do NOT reduce compaction, nor do they affect core cultivation, thatch control, installation of proper drainage systems and intelligent irrigation management. Some of the PROVEN advantages to wetting agent use are:

- Improved water movement in soil, especially in layered soils.
 - Rewetting of hydrophobic root zones.
 - Reduced movement of pesticides into the thatch layer and underlying soil.
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 - Reduced turf wilting and improved turf growth and quality (because of the preceding effects)
- Potential negative effects (generally seen only with misused/misapplication)
- Phytotoxicity (when applied to stressed turf, or if not properly watered-in)
 - Root injury (rare)
 - Increased thatch accumulation (the healthier the turf, the more thatch it forms)
 - Deflocculation (dispersion) of soil particles (a POTENTIAL problem with long-term use of excessive rates)

Which brand of wetting agent is the best? That's like asking what is the best kind of beer, or which is the best model of a pick-up truck.

Typically, we use the wetting agent with which we have the most experience, the one that we know we can depend upon. They all work in the same manner, and all possess the potential to be misapplied. When trying a new wetting agent it is best to follow the label until you are comfortable with its activity because the chemistry of wetting agents can differ greatly. Some of the most effective wetting agents can cause quite severe phytotoxicity when misapplied, but that is the fault of the applicator and NOT the wetting agent.

Treat them as you would any other chemical tool and you will stay out of trouble. Residual activity will also vary with the brand that is used, application rates, soil types, amount of thatch, temperature, irrigation regime and the type of problems that you are attempting to solve. Soil microbes will utilize wetting agents as a food source, and these materials can be leached through root zones, especially on sandy soils.

When isolated dry spots or a layered soil is the problem, core cultivation, in conjunction with wetting agent use is

(Continued on Page 36)

Weeds —

(Continued from Page 5)

Martin recommends standard split applications if turf has a history of problems with goose crabgrass. And be sure irrigation, fertilization, insect and disease control and other maintenance programs are fine-tuned in order to maintain a dense healthy turf and keep weeds out.

Achieving a dense turf stand is also important before using a turf growth regulator. "Especially in the northern part of our region, where you have to regrow 50 to 60 percent of the bermudagrass canopy. It's important that you have turf as dense as you want it before you use a growth regulator," Martin said.

Martin has another reminder for those using growth regulators—they don't work on weeds in the same manner as turf. Good weed control is not replaced by a turf growth regulator, but must be used in combination.

Know Your Turf

Go outside and take a close look at your turf this Spring—that's the first step in good weed control, says Tom Cook, turfgrass extension specialist at Oregon State University. Note thin areas and reseed them.

Using an inexpensive thermometer, begin monitoring soil and air temperature. Push the thermometer into the soil about one inch deep in areas where soil will warm up first—south-facing slopes and open areas near sidewalks and driveways.

Crabgrass germinates at 55 to 60 degrees F. and a pre-emergent should be applied about two weeks before germination. "When soil temperature is above 50, that's when you should apply pre-emergent," Cook said.

A combination product of several herbicides is still the best strategy for broadleaf weeds, giving broad-spectrum control and allowing lower rates of the dicamba, Cook said. But long-term use can also result in resistance in weeds like oxtails and ground ivy. In that case, switch to another herbicide.

When spraying broadleaves, be careful of other plants. "Spring weed control is a kind of strange experience," Cook said. "When it's optimal to spray for broadleaf weeds, that's when trees and shrubs are most susceptible to drift."

Before leafout, use an ester formulation; afterward, an amine form of the product will minimize potential injury to ornaments.

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Wetting Agents —

(Continued from Page 32)

always more effective than wetting agents alone. Regular use of wetting agents in these situations is important because they are not eliminating the condition, only temporarily modifying it. Regular use of wetting agents enhances water infiltration and drainage, resulting in more efficient water use, fewer overly wet/dry spots and better quality turf.

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