

APPLICATOR'S LOG

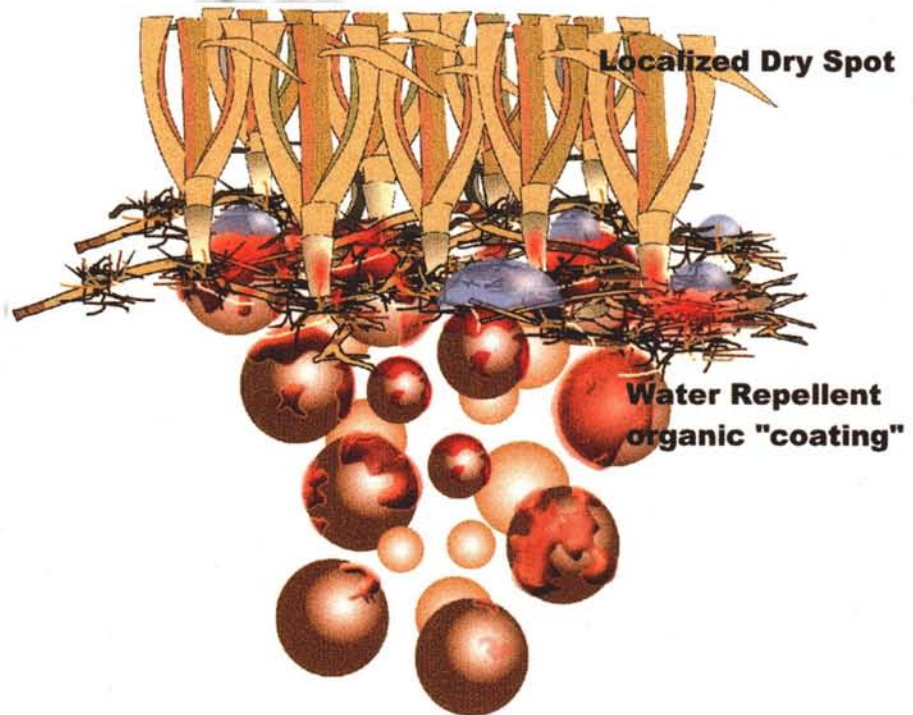
How Wetting Agents Apply

By Dr. Tony Koski

Water is a truly unique compound. Individual water molecules have a strong attraction to each other due to their dipolar nature, while at the same time being strongly attracted to other things in nature, such as clay, silt and organic matter. This attraction allows soil to hold water for plant use. Water, however, 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 type of sports field construction.

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 turf professionals, similar hydrophobic conditions can develop in soils and prevent water from moistening soil uniformly. This is the reason hydrophobic soils, thatch and isolated dry spots occur.

In other situations, we encounter stratified layers in rootzones, the result of changes in philosophy regarding topdressing materials and/or frequency. Water has a difficult time moving between adjacent layers of sand, thatch, soil, peat, sand again, thatch again, and so on. You get the picture.



In a typical hydrophobic situation, a waxy or other water-repellent coating forms over soil particles and thatch, increasing the attraction of water to itself. The water bead up and does not spread evenly. Illustrations courtesy: Colleen M. Tocci, Aquatrols Corporation of America.

The Good, The Bad and The Useless

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 enables the water to spread out more evenly over hydrophobic surfaces, to move more quickly through small pores and more effectively across “boundaries,” such as those layers in turf.

What They Don't Do. As a point of caution, don't consider wetting agents “miracle cures.” They:

- do not reduce compaction,
- do not affect plant water-use rates,
- cannot replace basic cultural practices like proper topdressing frequency, core cultivation, thatch control, installation of proper drainage systems and intelligent irrigation management.

Possible Benefits. Some of the proven advantages of wetting-agent

use include:

- improved water movement in soil, especially in layered soils;
- rewetting of hydrophobic root-zones, sands or thatch;
- reduced dew and frost formation.

Unproven by research, but often speculated on, is improved movement of pesticides (particularly insecticides) into the thatch layer and underlying soil.

Possible Harm. Potential negative effects (generally seen only with misuse or misapplication) include:

- phytotoxicity when the wetting agent is applied to stressed turf or if it is not properly watered in;
- root injury (rare);
- increased thatch accumulation (the healthier the turf, the more thatch it forms);
- deflocculation (dispersion) of soil particles, which is a potential problem with long-term use of excessive rates.

What Brand Is Best?

This is like asking what is the best beer or the best pickup truck. They all possess the potential to be misapplied,



Changes in philosophy regarding top-dressing materials and/or frequency can result in stratified layers that water will flow over rather than penetrate — a condition wetting agents can temporarily modify.

and all can achieve the same results: enhanced water infiltration and drainage, more efficient water use, fewer overly wet or dry spots, and better-quality turf. Those that have large market shares wouldn't sell if they were not effective wetting agents.

Typically, we use the wetting agent with which we have the most experience — the one that we know we can depend on.

Reminders

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.

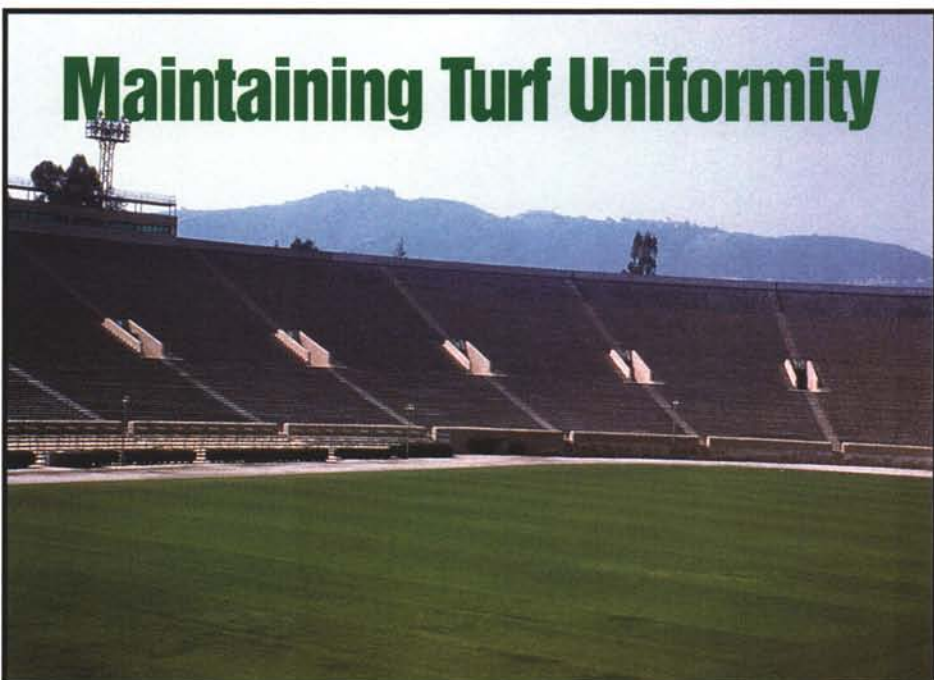
Residual activity will depend on many factors: the brand used, application rates, soil types, amount of thatch, temperature, irrigation regimen and the type of problem you're

trying to solve. Also, soil microbes will utilize wetting agents as a food source, and wetting agents can be leached through rootzones, especially on sandy soils.

When isolated dry spots or a layered soil is the problem, core cultivation in conjunction with wetting-agent use is always more effective than wet-

ting agents alone. Regular use of wetting agents in these situations is important because they are not eliminating the condition, only temporarily modifying it. □

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