

Soil wetting agents for improved turfgrass

In these times of inadequate water supplies for many turf needs, the key is to make available water more efficient.

■ Wetting agents are members of a broad category of chemicals called surfactants. This category also includes detergents and emulsifiers. Soil wetting agents are designed to improve the ability of water to penetrate soils without harming plants. Their use for horticulture and turf culture was first conceived and patented in the

mid-1950s.

Wetting agents are often used to improve water penetration on heavy or compacted soil, or on turfgrass with excessive thatch. What many turf managers overlook, however, is that a wetting agent can also be used to "dry down" wet soils.

How they work—Soil wetting agents primarily work by loosening the bonds that hold water molecules together, often hindering uniform water penetration and thorough drainage, according to Drew Effron of Aquatrols Inc.

Wetting agents change the physical properties of water. They reduce surface tension, which makes it possible to wet the surface of solid objects such as soil parti-

cles or thatch. With less surface tension, the water can penetrate and move more uniformly through soils.

"Wetting agents do not change the soil—they change the way water behaves in soils," says Effron.

"A wetting agent-treated soil will be easier to more thoroughly and more uniformly wet, but it will be more difficult to over-wet because of the water's increased mobility."

The basics—Soil wetting agents can be non-ionic, anionic, cationic, or a blend.

Anionic (negatively charged) wetting agents are seldom used on turfgrass because they are somewhat more phytotoxic and are suspect to leaching. Cationic

How wetting agents can help your turf

■ Thatch can absorb insecticides, and insecticides are only effective if they come in contact with the target organism. That's why it's sometimes better to pre-wet the thatch, and then apply 1/2 to 1 inch of water afterward.

In this way, the use of a wetting agent can increase the effectiveness of an insecticide.

Wetting agents can often increase foliar uptake of nutrients like nitrogen and iron. By spreading water over the leaf tissues and wetting the waxy cuticle, greater stomatal and cuticular absorption can occur.

In some instances, herbicide and fungicide activities may also be enhanced by wetting agents.

On sloped areas where thatch contributes to water run-off, a wetting agent can allow rapid wetting of the thatch and better water infiltration. Thatch tends to become hydrophobic (water repelling), and wetting agents help correct these conditions for one to two weeks after application.

A common observation for one to two weeks after applying wetting agents is less dew formation. The wetting agent allows dew to spread over the leaves and thatch instead of forming droplets. On golf course greens or high maintenance turfgrasses, this can inhibit disease activity. However, on home lawns, this should be viewed as a side benefit—but not of sufficient importance to warrant applying a wetting agent for this sole purpose.



Golf course superintendents are often confronted with hydrophobic sands on golf greens or fairways of very high sand content (more than 95 percent). Wetting agents are a primary treatment for these areas. Fortunately, this problem is extremely rare on other turf areas.

On hydrophilic soils (wetable soils), which are the vast majority of turfgrass soils, wetting agents have sometimes been applied to improve drainage, structure, rooting and/or aeration. These benefits of wetting agents on hydrophilic soils have not been consistently documented in research studies, nor is there theoretical reason to believe any significant benefits would occur.

In conclusion, wetting agents can be used to alleviate specific soil or climatic factors that limit growth.

When specific problems exist that wetting agents can alleviate, they are indeed beneficial.

Routine or indiscriminate use of wetting agents is not recommended.

—Dr. R.N. Carrow, Univ. of Ga.

Benefits of soil wetting agents:

- 1) Prevent, control and/or touch up localized dry spots.
- 2) Control wet areas.
- 3) Improve pesticide activity.
- 4) Improve water use efficiency.
- 5) Reduce disease resistance.
- 6) Improve turfgrass rooting.
- 7) Reduce irrigation requirements.

(positively charged) wetting agents act much like cations in the soil and are tightly held to the soil, which makes them less effective.

But non-ionic wetting agents have no charge and appear to be less phytotoxic than the other classes. They come in the form of esters, ethers and alcohols, which—in combination—provide more effective wetting over a wide range of soil types.

"Some products, too, are irreversibly adsorbed onto the soil particles so that they continue to exert their effect for several months," notes Effron. "Such products do not leach out of the rootzone, but are slowly degraded over time."

Localized dry spots—The number one benefit of using a wetting agent is the elimination of localized dry spots, a problem most affecting turf quality on golf courses but also a problem of many other turfgrass sites, according to Dr. Martin Petrovic of Cornell University.

The problem is caused by a fungal growth that produces a wax-like material that coats the particles of soil or thatch, Petrovic says. Sometimes the soil is affected by the fungus so deeply that cultivation may be ineffective. But when wetting agents are applied to localized dry spots, the soil moisture conditions are usually improved, notes research conducted at Michigan State University.

Selection—An important factor when

selecting a soil wetting agent is its percentage of active ingredient. Soil wetting agents are available in concentrations from 15 to 100 percent active. Keeping in mind that performance is a result of physically having enough material present to initially treat the water and then reside in the rootzone, products diluted with water cannot provide the same results as concentrated products unless higher rates or more frequent applications are used.

Finally, wetting agents—like any other product—can have harmful effects if not used properly. However, carefully selecting your wetting agent and carefully following the directions for application rates and frequency, you will experience fewer water-related problems, create more uniform turf growing conditions, and improve water use efficiency.

—Sources: Drew Effron, Aquatrols Inc., and Dr. Martin Petrovic of Cornell University ("Wetting Agents," *Weeds Trees & Turf magazine*, July, 1985.)

Hort consultant suggests using trees for shade, lower utility bills

■ Landscapers should use more plants around their clients' buildings in order to reduce utility/electric bills, says J. Joseph Pearl, a horticultural consultant in Mesa, Ariz.

"Whether it be in Arizona or somewhere in the Midwest, trees, shrubs and vines will work if planned out properly," Pearl says.

He suggests using trees that are deciduous and full in their growth habit.

"Although trees like mulberry (*Morus alba*) will provide incredible shade, they tend to use an awful lot of water," Pearl points out. And the shade is so dense under these trees that not many plants will grow under them. "It is best to select low-water-use trees, especially in the Southwest, where water is expensive and at times hard to come by."

Pearl cites mesquite trees (*Prosopis spp.*) on the west side of a home or building in the Southwest. "By planting these trees in groupings of threes, fives and sevens, the shade will be marvelous," he notes. "These fast-growing trees will block the sun in the summer while allowing the sun to hit the building in the winter, thus warming the building."

Pearl also suggests using ash (*Fraxinus*

spp.) "These globe-shaped trees will give ample shade in the summer and, once defoliated, allow for warming sun rays to heat the building."

As the plants mature, Pearl points out, the protected area will be much cooler,

though cooling effects are generally immediate.

"Regardless, plan the landscape so that the trees planted on the west side of the home or office will provide shade in the summer and the sun's rays in the winter."



Pearl says mesquite trees help cool buildings in the Southwest.