

Soil Wetting Agents for Water Conservation

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Soil wetting agents use in the turfgrass industry has increased dramatically over the last 20 years. Turfgrass managers look to wetting agents for many purposes, such as improving moisture retention in hydrophobic soils and for promoting overall soil moisture uniformity (Zontek and Kostka, 2012). There is a breadth of knowledge and research around soil wetting agent impacts on moisture dynamics in soils and benefits to turfgrass health, although many regional and multi-year trials fail to replicate the same performance of wetting agent chemistries (Karnok, 2013).

Wetting agents are surfactants, or surface-active agents, that work by reducing the surface tension of water and restoring the polar bond between water molecules and soil particles (Karnok et al., 2004). A current classification system by Zontek and Kostka (2012) groups wetting agents into 4 categories: 1) anionics and blends with anionics, 2) nonionics, 3) cationics, and 4) new chemistries. Nonionic products are by far the most widely used due to relatively low phytotoxicity and persistence in the soil (Carrow, 1989), and they can be further broken down into 6 categories based on specific active ingredients (Zontek and Kostka, 2012). Reported practitioner benefits of wetting agent use include relieving localized dry spot, improving drainage, managing water, improving pesticide movement, decreasing dew formation, removing frost, enhancing seed germination, reducing fairy ring, improving irrigation efficiency, reducing dust and improving bunker firmness (Karnok et al., 2004). More recently, wetting agents are being promoted for their value in creating firmer playing surfaces, although several studies lack evidence for these claims (Kaminski and Han, 2010; Moeller et al., 2007; Nangle et al., 2015).

In the spring of 2016, a wetting agent survey was emailed to the Minnesota Golf Course Superintendent's Association and 64 golf course superintendents completed the survey. Almost 90% of the superintendent respondents indicated that they apply wetting agents to putting greens (Table 1) and 55% apply wetting agents to fairways (Table 2). When asked what characteristics they look for in soil wetting agents, a majority of the respondents indicated that they use wetting agents for preventing localized dry spot, improving moisture infiltration and uniformity, to create firmer surfaces, and to improve stress tolerances. Wetting agents can in fact do all of these things, however results are often difficult to duplicate and can be inconsistent from one property to the next. In this session we will discuss the multitude of wetting agent offerings for turfgrass managers, with a focus on water conservation. We will also discuss the most recent wetting agent trials being conducted at the Turfgrass Research, Outreach and Education Center.

Table 1. Do you use wetting agents on putting greens?

Answer	%	Count
Yes	87.50%	56
No	12.50%	8
Total	100%	64

Table 2. Do you use wetting agents on putting greens?

Answer	%	Count
Yes	54.55%	30
No	45.45%	25
Total	100%	55

Figure 1. What characteristics do you look for in a wetting agent?

