

# Benefits of making the water wetter

**S**ufficient levels of water availability to the roots of turf grasses are imperative for their healthy growth and development. If the plant roots are either starved of water or forced to tolerate conditions of waterlogged soil, the turf will rapidly show signs of stress, increased susceptibility to disease and in severe cases, even death. The specific water requirements of any given turf area depends on the grass species present in the sward, environmental conditions and the use of the turf area. Effective irrigation systems and correct drainage of the turf areas are required in conjunction with the experience of the greenkeeper to determine the amount of water to be applied and when.

However, certain situations arise in which, irrespective of the amount of water applied to a given area, sufficient water is not made available to the plant roots. Examples of these are high spots and slopes which will generally dry out more rapidly than surrounding

areas, compacted soils, turf supporting a deep thatch and areas affected by water-repellent soils. In each case, applications of water alone may not provide adequate levels of available moisture in the areas where it is most needed. To overcome this, products can be applied which effectively make the water wetter than normal. These wetting agents have been used for many years to improve water penetration in areas from which water would normally shed. Advances have been made regarding the type of molecule used in these wetting agents to ensure that they pose no adverse effect on either the soil structure or the turf itself.

The market now supports a range of wetting agents that have been specifically developed for use on areas of fine turf. This is a dramatic advance from early attempts to increase soil wetness in problematical areas through applica-

tion of soap and detergent solutions. Both of these products acted to reduce the surface tension of water thereby increasing its ability to wet the soil when applied. However, these chemicals were not designed for this purpose and problems such as scorching and adverse effects on the soil structure occurred.

So-called non-ionic wetting agents are arguably the best products to use if wetting agents are to be applied to a given area. Because the overall charge on the molecule is neutral, they persist in the soil to varying degrees and are the least phytotoxic of the wetting agents to the sward. The surface tension that exists on the surface of a water droplet is the result of forces between the individual water molecules within that drop. Each molecule pulls towards the surrounding molecules resulting in the spherical water drop. If the drop lands on a surface which resists wetting, the water droplet remains in a similar shape. This effect is the same as that seen by water as it beads on the paintwork of a recently polished car. If this condition occurs on turf that is difficult to wet, the water will either run off the area or be lost through evaporation before it is able to penetrate the soil to the rootzone. Wetting agents reduce the attractive forces between individual water droplets and allow the water to spread across areas of turf which normally show a natural water repellence. Lowering water tension physically changes the way in which it moves in the soil and allows more rapid water movement and more uniform wetting.

Different wetting agents will vary in their effectiveness to wet soils, either in their ease or duration of efficacy. Most of the wetting agent products available for use on amenity turf are composed of varying percentages of esters, alcohols and/or ethers. It is essential to adhere to their specific rate of application and dilution, so as to achieve maximum effect and longevity in the soil and avoid phytotoxicity which can result from incorrect application. Areas of turf which show annual effects of either water-repellent soil or general drought stress, should receive the initial wetting agent applica-

tion prior to onset of the symptoms, at the start of the growing season. In severely affected areas, much can be gained from regular wetting agent applications through the April to October period, spraying the product at four to six week intervals. This can be carried out in combination with aeration to aid turf penetration.

The non-ionic wetting agents are water soluble and are therefore applied to the turf through a sprayer or watered on in solution. They are available in three main forms: as a granule, a liquid and a concentrated block which can be placed on-line in a hose for hand-watering certain areas. The type of product used depends on personal preference and how any one specific course reacts following its application. The cost of wetting agents is something that should be considered before choosing a specific product. Some products may appear cheaper than others per given volume of concentrate, but these may not contain the same amount of active ingredient nor subsequently provide the same degree of efficacy as each other.

Wetting agents should be applied early in the year before the symptoms of drought stress or water repellent soils appear. If applications are delayed until the symptoms become apparent, it may take a more intensive programme to achieve the required results.

Wetting agents are unquestionably a major tool in the successful management of areas of fine turf. Not only do they enhance water availability in soils that for whatever reasons are unable to offer adequate moisture, but as a "side effect" of their application they tend to reduce the formation of dew on the sward and keep the turf surface drier, hence less susceptible to disease development. Enhanced root development has also been observed in soils treated with wetting agents and this may contribute to the turf's ability to tolerate and recover from heavy traffic.

The benefits of using wetting agents on fine turf far outweigh the potential problems that could occur through either incorrect application or application on stressed turf. Wetting agents will continue to be an important tool in the greenkeepers' fight to provide the quality of turf that both they and the club members require.

by Kate York of the STRI

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