

# Sustainable Solutions By Richard Fry

For turf grass professionals, a dense, healthy plant and consistent playing surface are key goals.

The achievement of these targets is extremely challenging, requiring the use of pesticides, fertilisers, soil conditioners, wetting agents and water, together with certain intensive management practices such as regular mowing and aeration regimes to achieve and sustain the desired condition.

For example, modern golf course greens are mowed at a height of 3-4mm and are designed to receive the majority of the wear even though the total green's surface can be as little as 3% of the total playing area of a golf course. However, even under intensive management, the goal of turf sustainability is becoming the main focus of attention as greenkeepers, agronomists and research organisations work to identify turfgrass management systems that are more efficient, thus requiring less inputs.

Increased use of wetting agents (surfactants) can improve aspects of turf sustainability by increasing uniform soil wetting and decreasing irrigation requirements. Water conservation is a major issue and any savings in water usage on turf by reducing the amount of supplementary irrigation will be welcomed.

Incorporating a wetting agent in to the turf management programme will maximise infiltration and minimise runoff and help retain water within the soil profile. With these gains, golf courses can be maintained with reduced pesticide, fertiliser and water needs; benefits that are consistent with the aims for sustainability.

Wetting agents are often referred to as surfactants. The word "surfactant" is actually derived from the words, surface active agent.

The application of wetting agents on turf is not new as products for this use have been around since the early sixties. However, their use was quite limited as in the early years the formulations available were basically industrial surfactants such as Teepol. It was not until the early eighties that wetting agents, developed specifically for use on fine turf, became more widely accepted throughout the UK.

## IMPROVED WATER UTILISATION

Wetting agents work by lowering the cohesive and adhesive water surface tensions and this allows the water to more easily move into the soil and thatch instead of just laying on the surface or running off sloping contours. The benefit of applying a programme of wetting agents therefore is improved water utilisation, whether from natural rainfall or applied irrigation.

Historically, some UK soils in which turf is grown are hydrophilic. A hydrophilic surface will readily suck up the water until it reaches a state of full absorptency.

However, there are many soils that are referred to as hydrophobic as they do not have the ability to rapidly soak up water and in most cases will repel any absorption. Many of these soils, and also sand based constructions, will have particles that have formed an organic, waxy coating that will repel moisture. With out treatment these water repellent soils will cause major problems with localised dry spots (LDS) that will not support root development or plant regeneration.



As an example, to better understand the interaction of surfaces in regard to surface tension, absorption and repellency, a simple experiment can be carried out by placing a water droplet on a piece of blotting paper and another on wax paper. The blotting paper is generally hydrophilic, which means the water droplet is not affected by surface tension and the paper's adhesion between the water molecules and itself are greater than that of the water's molecules alone. So the water is absorbed quite readily. When attempting the same experiment on wax paper, the droplet does not separate and beads up. This is because the wax paper is hydrophobic and does not allow for the absorption of water rapidly. It is the wax coating on the paper whose molecules are weaker than that of the water, so absorption does not take place. It is this wax-coating example that has led to a high level of research into developing formulations that will allow water to be absorbed by hydrophobic soils.

## STANDARD WETTING AGENTS ALONE ARE NOT THE ANSWER:

Though treating turf surfaces with standard wetting agents will infiltrate the ground by force of gravity and allow some spreading to occur, complete wetting of the soil rootzone will not happen.

Infact, these products will only act as a maintenance tool to manage the symptoms. They cannot and will not address the cause. As a result, those areas left untreated within the soil profile will continue to be water-repellent. When subject to a sequence of wet/dry cycles, these areas develop dry spots and high spots. Sloped contours are highly vulnerable to these conditions.

It is important to note that dry spots can occur for many reasons on greens. Other causes that should be examined are compaction problems, excessive thatch accumulation, insect and disease presence and poor irrigation coverage.

To counter the problems associated with standard wetting agents one company, Rigby Taylor has undertaken a great deal of research into complete immersion technologies that addresses the problem in three ways; 1. Initial soil penetration, 2. Rootzone wetting & spreading and 3. Soil profile re-wetting.



Soil core showing a conventional wetter



Conventional wetting agent droplets

Wetting agents with some spreading characteristics

Complete Immersion technology

This unique, three-in-one approach, allows the wetting agent to achieve a strong attraction between the applied product molecules and the soil particles. This attraction converts a water repellent soil in to one that is water receptive with the result that the wetting agent more easily penetrates the soil surface and thatch layer. The wetting agent spreads both vertically and laterally across the water repellent zone and advances deeper into the rootzone.

## SOIL RE-WETTING

The hydrophobic (water repellent) end of the re-wetting molecule attaches itself to the waxes and lipids covering the soil and sand particles.



Re-wet

The hydrophilic (water-loving) end which attracts the water molecules so allowing the soil to re-wet. The extended chain is very stable and so provides a long-lasting effect.

The advanced immersion re-wetting technology ensures that once penetration of the target rootzone has taken place, a dry soil will be re-wetted in 4-6 hours and visible effects can be seen in 48 hours.

When it comes to selecting a turf wetting agent it is vital that the buyer selects from a reliable and proven source, one that can provide technical advice and ongoing support. There are many products currently being promoted within the industry but it is important that the right product is selected for a particular problem. It is also important to stick to the recommended programme. It took a long time for the problem to occur so there are no quick-fix methods in its removal.



Soil core showing Complete Immersion Technology benefits

Richard Fry works for Greenlink International. For further information contact Rigby Taylor on Freephone: 0800 424 919 or visit: [www.rigbytaylor.com](http://www.rigbytaylor.com)