



H₂Pro[®]

Wetting and Water Conservation Agent



Growing success



Features and Benefits

- ✓ Significantly reduces irrigation requirements
- ✓ Unique curative and preventative action against Dry Patch (Localised Dry Spot)
- ✓ Effective through the rootzone and not just the surface
- ✓ Excellent spreading and penetration characteristics
- ✓ Flexible application programmes and flexible water rates

The new wetting and water conservation agent

New H₂Pro is the latest tool to help in the management of water in turfgrass rootzones. H₂Pro has been developed to help solve the two main water related problems facing the turf professional today – the lack and cost of suitable irrigation water and Dry Patch.

Water Conservation Problem

Water is a valuable resource, as part of an environmentally sound management programme the optimum use of irrigation is essential.

optimum amount of irrigation is applied to ensure that the least amount of contaminants are applied.

The new technologies contained in H₂Pro ensure that water is utilised at maximum efficiency in the root zone.

The Dry Patch Problem (Localised Dry Spot)

The other major water related problem for turf professionals is the control and management of Dry Patch caused by a build up of water repellent deposits in the rootzone.

These deposits are formed by the break down of organic matter and by the activity of fairy rings. These deposits coat the sand and other soil particles in the top 50mm of the rootzone and during the process of the rootzone drying out, they become hard.

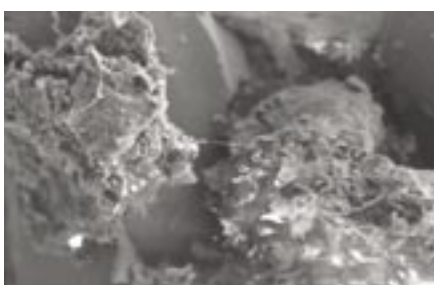
Once these deposits have hardened they become water repellent.

The need to achieve the most effectiveness out of applied irrigation and prevent excessive irrigation was the main criteria in the development of H₂Pro.

Maintaining an optimum level of water in the rootzone is essential in producing a turf playing surface of the highest quality. Too little available water and turfgrass will suffer drought stress, too much and the turfgrass will suffer from water logging.

Another problem facing the turf professional is the quality of irrigation water available. All too often, available irrigation water is of poor quality with high levels of contaminants.

Therefore it is essential that only the



Sand particles with hardened hydrophobic deposits



Sand particles unaffected by hardened deposits

The New Scotts Solution

Wetting agents are composed of surfactant chemistry; this is a large group of chemicals that have the effect of causing a physical change to the surface of a liquid. Wetting agents have been used over the last 20 years to combat the symptoms of Dry Patch. Many advances have been made in their chemistry to produce more effective and safer products.

Now with the launch of H₂Pro, Scotts have introduced 3D Technology® surfactants with Multi-Matrix® mode of action. This latest generation of surfactant offers unique curative and preventative properties for the control of Dry Patch, excellent water conservation and flexible application.

The H₂Pro range contains four different formulations

- ✓ H₂Pro Liquid
- ✓ H₂Pro Granules
- ✓ H₂Pro Tablets
- ✓ H₂Pro Maximise for fairways

What is H₂Pro?

- H₂Pro is based on new 3D Technology® surfactant technologies. The ingredients combine to work in the root zone to ensure the optimum use of applied water.
- H₂Pro has been trialed and tested at independent research centres across Europe and in the USA.
- H₂Pro has been tested for phytotoxic effects on turfgrass and has been shown to be safe to apply to all turfgrass types at the recommended rates. At the low application rates watering in is not even required.
- H₂Pro has the unique Multi-Matrix® mode of action. This technology allows applied water to efficiently enter the rootzone.

How it works

All formulations of H₂Pro contains 2 separate surfactant systems:

1. Wetting and spreading agents
2. Long term wetting agents,

Wetting and Spreading Agents

H₂Pro contains a new generation of wetting and spreading agents based on

new 3D Multi-Matrix® technologies. 3D Multi-Matrix® technology is innovative surfactant chemistry; it allows applied water to enter the rootzone in areas previously affected by Dry Patch.

Due to their unique chemistry, the Multi-Matrix surfactants will allow initial wetting of the organic layers but then move down deeper into the rootzone. This ensures, that after an application of H₂Pro, the long lasting water conservation effects occur throughout the rootzone and not just the surface or thatch layers as with older wetting agent technologies.

'H₂Pro has been developed to help solve two problems: the lack and cost of suitable irrigation water and dry patch'

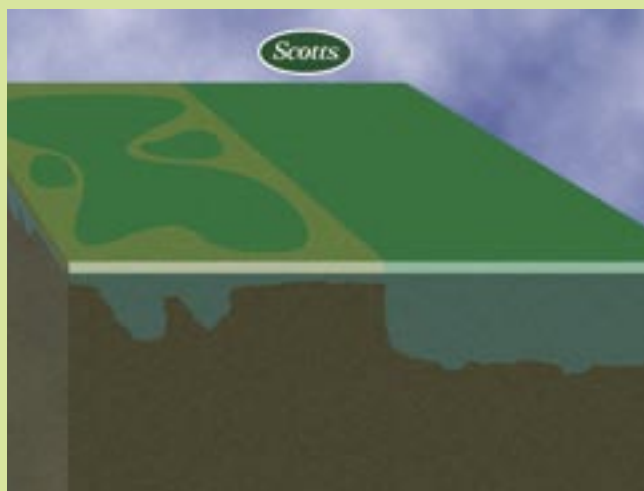
H₂Pro is based on Multi-Matrix mode of action



Untreated:
After irrigation the water is unevenly distributed across the surface.



H₂Pro:
After irrigation is applied the water remains perfectly distributed across turf surface.



Untreated:
Poor water distribution resulting in uneven water movement on surface and within the rootzone.

H₂Pro:
3D Multi-Matrix movement of irrigation water ensures even distribution of water across the surface and down the soil profile.



Long-term wetting agents

3D Technology was first developed for water conservation in areas where there is a lack of irrigation water. After an application of H₂Pro the 3D Technology surfactants are carried down, into and throughout the rootzone by the Multi-Matrix mode of action

H₂Pro containing 3D Technology is unique in that it contains 3 different chain lengths of surfactants – short, medium and long chain. This allows

greater flexibility in application programmes and a more consistent effect throughout the rootzone.

The short chain wetting agent provides excellent initial wetting properties and breaks down within 4-6 weeks. The medium chains break down within 6-10 weeks and the long chain wetting agents take up to a season to break down.

3D Technology surfactants create a very strong water holding capacity and hold

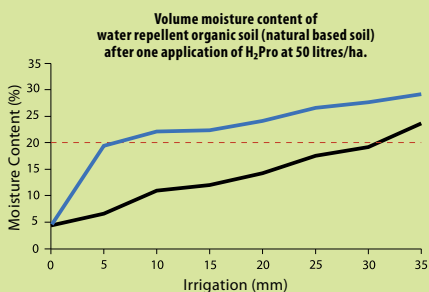
the optimum amount of water in the rootzone. If too much water enters the rootzone drainage will occur as normal but as the rootzone dries, water is held in an available form for longer and enables prolonged uptake by the turfgrass roots. H₂Pro will not hold water in the rootzone beyond field capacity.

H₂Pro Environment

The ingredients in H₂Pro are non hazardous and are safe to turfgrass and soil micro-organisms.

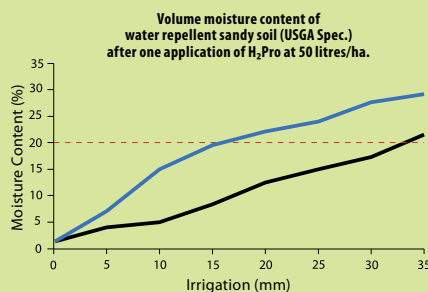
H₂Pro trials

H₂Pro has been trialled and tested at several independent research centres across Europe and the USA as well as the Scotts Levington Research Station. Below are some typical results from the UK in 2004.

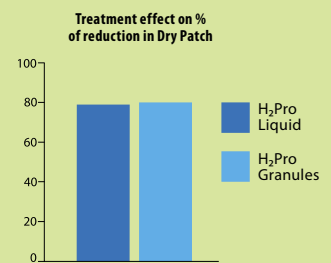


In other words ...

... on natural soil, 31 mm of irrigation was needed to reach the optimum moisture content whereas with H₂Pro only 7 mm of irrigation was required.

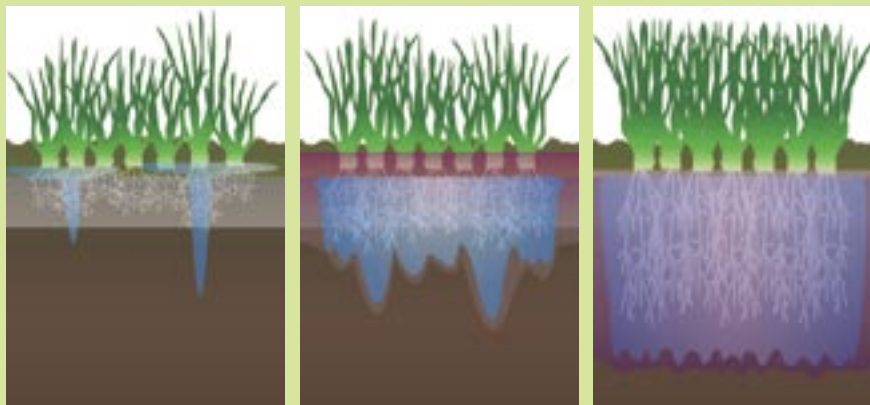


... on sandy soil, 33 mm of irrigation was needed to reach the optimum moisture content whereas with H₂Pro only 16 mm of irrigation was required.



... H₂Pro was found to reduce Dry Patch by up to 80%

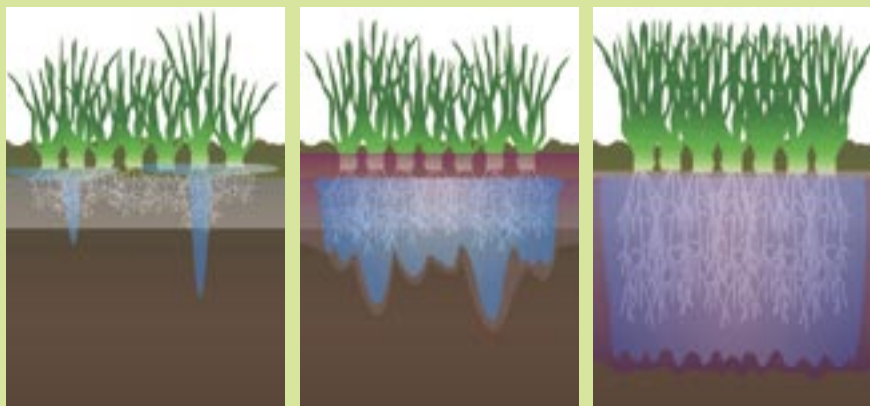
H₂Pro working principle



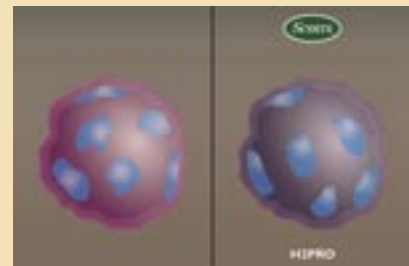
Untreated:
Very uneven penetration of irrigation water. Finger-flow water movement often occurs.

Normal wetting agent:
Wetting agent attaches itself to surface thatch layers which limits the amount which can penetrate further down the soil profile. Poor penetration of water occurs which can encourage shallow rooting. Problems such as drought stress and *Poa annua* invasion may be more prevalent.

H₂Pro:
H₂Pro efficiently by-passes the thatch layer to allow coverage through the hydrophobic layer and deeper into the rootzone. Deep and uniform water penetration takes place which encourages good rooting. Plants with deep root systems are more efficient at nutrient uptake and more resistant to drought stress.



In normal, non-hydrophobic conditions, soil particles are able to hold water on their outer surface. However, if organic material builds up on the soil particle over time, the surface will start to become hydrophobic causing the soil to repel water and start to dry out. Once a complete organic layer has formed on the soil particles, it is no longer possible for the soil to hold water. The soil will dry out and become water repellent.



After application of a wetting agent, soil particles are again able to hold water. Wetting agents act as a bridge between hydrophobic soil particles and water molecules.



The use of 3D Technology (application of wetting agent chemistry in 3 different chain lengths) ensures a long lasting effect. This leads to soil particles being able to hold water over a longer period of time. Due to the prolonged wetting of the organic layers with H₂Pro it is possible to actually breakdown the hydrophobic barrier and actually provide a curative action.



The H₂Pro product range

There are four different formulations available in the H₂Pro range: Liquid, Granules, Tablet and Maximise.

H₂Pro Liquid

H₂Pro Liquid is a premium wetting agent that can be applied using three separate application programmes to best fit the maintenance needs:

- Monthly
- Bi-Monthly
- Annual

Monthly Application Programme

H ₂ Pro Liquid	Rate	Water Volume	Area
Initial Application	25	600 – 900 L	1 Ha
Monthly Application	10 L	600 – 900 L	1 Ha

No watering-in required.

Bi-monthly Application Programme

H ₂ Pro Liquid	Rate	Water Volume	Area
Bi-monthly application	25 L	600 – 900 L	1 Ha

No watering-in required.

Annual Application Programme

H ₂ Pro Liquid	Rate	Minimum Water Volume	Area
Annual application	50 L	2000 L	1 Ha

Watering In required.

Wet grass prior to application and water in immediately after application for 5 to 10 minutes, ensuring at least two passes of the irrigation cycle to the treated area.

H₂Pro Granules

H₂Pro Granules use Biodac® as a carrier, Biodac is free flowing, dust free, cellulose complex carrier for H₂Pro. After application it releases the H₂Pro and quickly breaks down into naturally occurring elements.

H ₂ Pro Granules	Rate	Area
Bi-monthly application	200 Kg	1 Ha

No watering-in required

H₂Pro Granules can be applied accurately and evenly using the Scotts range of spreaders.



H₂Pro Tablets

H₂Pro Tablets are a 100% active tablet, containing H₂Pro wetting agent for immediate relief of plant stress due to hydrophobic soil conditions. H₂Pro tablets can be applied through the new H₂Pro applicator gun.

H ₂ Pro Tablets	Rate	Area
One tablet used as required	5-10 minutes/green	6-7 greens



H₂Pro applicator gun

H₂Pro Maximise

H₂Pro Maximise is formulated especially for use on fairways and outfield type turf-grass areas. H₂Pro Maximise can be applied with a standard boom sprayer or by a powered irrigation injection unit for application through irrigation systems.

H₂Pro Maximise is ideal for application on fairways to produce a more consistent colour effect and to reduce the need for irrigation.

H ₂ Pro Maximise	Rate	Water Volume	Area
Monthly Application	40 L	250-500 L	1 Ha

H₂Pro Pack Size

- H₂Pro Liquid – 4 x 5 litre in a box
- H₂Pro Granule – 10 kg bag
- H₂Pro Tablet – 6 x 250g tablets in a box
- H₂Pro Maximise – 200 litre drum

Situation of use	Monthly	Bi-monthly	Annual
Best performance in hydrophobic soils	***	**	*
Turf safety	***	***	**
Water conservation	**	***	*
No watering-in required	***	***	*
Low application rates	***	**	**
Low water volumes	***	***	**
Longevity	*	**	***
Flexibility	***	**	*

* Good ** Very good *** Excellent

Technical Notes:

The monthly application programme can be applied as part of a Scotts nutritional application programme. See your Scotts Technical Advisor for further details.

As with all soil acting products applications of H₂Pro will be most effective when watered into the root zone. We recommend that all applications are watered in within 24 hours after application and before the next mowing cycle.

Biodac® is a trademark of Kadant GranTek Inc.



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