

Dealing with dry patch

(it isn't all about the wetting agent)

Charles Henderson, STRI Turfgrass Agronomist for the North East, shares his technical expertise

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During the last four years advising in New Zealand, working with sports turf in a subtropical climate, dry patch has presented itself on several occasions, often leading to disease occurrence, unsightly and bumpy greens and hours of labour being lost trying to treat the knock-on problems and re-wet the affected areas.

In general, the industry is pro-active in treating dry patch preventatively but it is still common for turf managers to experience the condition. This article aims to discuss some of the issues around the condition, its treatments and accompanying cultural practices that are commonly lacking in treating dry patch.

Is your soil water repellent or do you have dry patch?

Hydrophobic soil conditions that lead to dry patch can occur for many reasons including:

- The build up of waxy residues that coat the soil particles caused by the bi-product of fungal activity in the affected area. This is often closely linked with fairy rings (basidiomycetes).

- Excessive and/or layered thatch within the top 20-30 mm of the green profile can contribute to dry patch by severely restricting water movement through the surface.

- Allowing soils to exceed a critical moisture deficiency after which re-wetting becomes significantly harder.

- Compacted soils and/or contaminated layers within the soil profile restricting water movement into or through the soil profile.

When trying to prevent and/or treat dry patch of any kind it is imperative we identify the exact cause of the condition to avoid wasted treatments.

Identifying dry patch preventatively

The best people to identify where dry patch might occur are the turf managers who have worked on the course for several years. Generally speaking, dry patch will occur in the same areas every year, so local experience is beneficial.

If you don't have the luxury of site specific experience, look carefully at your turf. Patches that look different, either through colour (often darker green) or species content

(usually more prone to bentgrasses/fescues), may indicate the presence of dry soil conditions. If areas that look different are identified then take a core sample to check soil moisture.

Examine the soil cores and look for some of the following:

- Any layers that might effect downward water movement.

- Any distinct layer of excessive thatch.

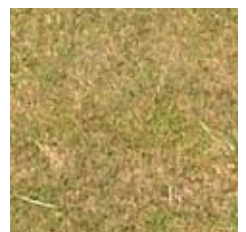
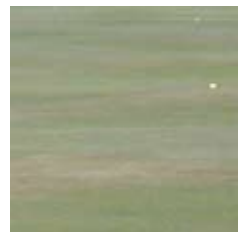
- Drop 'droplets' of water onto the soil core at various depth. Are the 'droplets' absorbed into the soil quickly?

Alternatively 'guestimating' where dry patch might occur for preventative treatments isn't unreasonable, especially in high areas or sloping greens.

Wetting agent terminology

As new wetting agents 'flood' the market claiming new modes of action, the risk of using the incorrect wetting agents for specific dry patch problems has increased. Using the incorrect wetting agent may result in reduced effectiveness of the application and wasted time.

In general, wetting agents are based on three modes of action:



MAIN ABOVE and INSET ABOVE: examples of dry patch





about the author

Charles Henderson is a recent addition to the STRI's South East Consultancy Team. Prior to that he had spent four years as Sports Turf Agronomist for the New Zealand Sports Turf Institute.

- Non-ionic surfactants – designed to help water stick to soil particles.
- Block Copolymers – designed to assist in the spread and retention of water within the soil profile.

- Organosilicones – improving the speed at which water moves through the soil.

In practical terms wetting agents have one or a combination of the following functions:

- Preventative – designed to help water particles 'stick' to previously hydrophobic soil particles.

- Curative – designed to break-down the waxy residues coating particles and wash them out of the rootzone. Note these can also be used preventatively.

- Penetrative – designed to improve water penetration through the surface and soil profile. These can also be used for dew control.

- Dispersion agents – designed to improve the dispersion (even movement) of water movement through the soil profile.

Confused? Many wetting agents on the market today are multi-functional and can act as a combination of the table shown on the right.

It is recommended you contact your regional agronomist to discuss further which wetting agents are right for your situation.

Example of soil wetting products, modes of action and distributor

Neither the list of products nor the distributors is exhaustive. Other products are available and each product may be available from other distributors.

Product	Distributor	Straight/Blend	Chemistry	Advertised Uses
Advantage pellet	Farmura	Blend	Non-ionic surfactant	b, e
Alleviate	Sherriff's Amenity	Blend	Non-ionic surfactant and organosilicone	b, e
Aqua-Aid	Vitax	Blend	Non-ionic surfactant	c, f, g
AquaMaxx	Vitax	Blend	Non-ionic surfactant	a, e, f
Aqueduct	Farmura	Blend	Non-ionic surfactant	b, e
Aquifer	Vitax	Blend	Non-ionic surfactant	a, f, g
Aqua - zorb	Turftech/Sherriff Amenity	Blend	Non-ionic surfactant	a, b, d, g
Award Osprey	Aitkens/Avoncrop	Blend	Block copolymer	a, b, e, f
Breaker Advance	Rigby Taylor	Blend	Non-ionic surfactant	a, b, e, f
Breaker Curative	Rigby Taylor	Blend	Non-ionic surfactant	b, d
Clearing	Vitax	Blend	Non-ionic surfactant	c, e
Correct OARS	Tower Chemicals	Blend	Non-ionic surfactant and organic solvent	d, e, f
Dewcure	Headland	Straight	Non-ionic surfactant	e
Dispatch	Farmura	Blend	Non-ionic surfactant	c, f, g
Excel	Sherriff Amenity	Blend	Non-ionic surfactant and organosilicone	b, e
Fifty 90	Farmura	Blend	Non-ionic surfactant	a, b, e, f, g
H ₂ Pro	Scotts	Blend	Non-ionic surfactant	a, b, e, f, g
Inflo XL	Headland	Straight	Organosilicone	b, e
Noburn	Novozymes		Yucca plant extract	a, e, f
OARS® Curative	Vitax	Blend	Non-ionic surfactant and organic solvent	b, d, e, f
Percol-8	Vitax	Blend	Non-ionic surfactant	c, f, g
Primer Select	Farmura	Straight	Block copolymer	a, b, e, f, g
Revolution	Farmura	Straight	Modified block Copolymer	a, b, e, f, g
TricureAD	Headland	Blend	Non-ionic surfactant	a, b, e, f, g
Ultraflo	Vitax	Straight	Non-ionic surfactant	a, c, e
XL Fairway	Headland	Straight	Organosilicone	c, e

- a – To treat localised dry patch preventatively
- b – To treat localised dry patch curatively
- c – To manage fairy ring
- d – To strip away organic coatings on sand grains
- e – Aid water penetration/dew removal
- f – Help ensure even water distribution in the rootzone
- g – Reduce irrigation requirements

Please note the information contained in the above table has been taken from the respective product labels. STRI does not accept any responsibility for the accuracy of these claims

Prevention is still better than cure

Generally, the industry has moved forward with the treatment of dry patch and the majority of clubs that know they will experience the condition treat it preventatively.

There are a range of products available to turf managers for the preventative treatment of dry patch and much debate goes on as to the effectiveness of each. However, it is as important to ensure you use the correct type of agent for specific dry patch problems.

It's not all about the wetting agent. Simply applying a wetting agent and watering it in without acknowledging what we need to achieve can lead to disappointment. There are numerous accompanying practices we need to consider when applying wetting agent.

Get it in whilst it is still wet. Preventing dry patch using preventative wetting agents requires the product to be moved through the soil profile to depth (0-125 mm). This is best achieved whilst there is still good soil moisture present. Spring treatments (late March/April) will achieve this best but monitor soil conditions.

Irrigation. After the application of any wetting agent watering in of the product may be required. However, the aim of the irrigation after wetting agent applications is to water the product into the green soil profile, not off it!

It is generally stated that people flood their greens to get water to move through the soil profile, this practice will encourage newly applied wetting agents to follow the path of least resistance, washing away from where its required (high knobs) to where it's not (already moist areas).

For example, we apply around 15-20 minutes of irrigation to flood the green applying around 10 mm of water. This risks creating surface run-off washing the product away from where it's required (high area and slopes) or worse, off the green.

Alternatively monitor your greens irrigation and observe how long it is before surface 'ponding' starts to occur (let's say 4-5 minutes), this then becomes your maximum run-time. So, rather than applying 15-20 minutes in one hit, we apply 3-4 irrigation schedules each 4-5 minutes in duration, 1 hour apart. This will minimise flooding and surface run-off whilst ensuring the product is thoroughly washed into the soil profile to depth.

Monitor soil conditions. Apparently our seasons aren't what they once were. As such, applying your

preventative wetting agent the exact same time as last year might not be as effective. It's easy to get caught out by early droughts, especially after the two summers we have just had. Monitor soil moisture in known dry patch areas and evapotranspiration rates, these will better allow you to judge when wetting agent applications should be made.

Get the rate right. This might seem obvious but getting the right rate of product and water rate will significantly impact on how much effect you get from application. Rates too low will significantly reduce the effectiveness of your product and in severe cases could make the application a waste of time. On the other hand, excessive application rates carry a risk of turf scorching. Simple but good advice here is read the label, contact STRI or the company supplying the product for technical advice.

Run the full programme. Starting your preventative programme in early spring will help increase your chances of minimising dry patch occurrence. Rarely in practice will one application last for the whole summer. Following a programme of preventative applications will significantly increase your chances of success.

Curative treatments

Either your preventative programme hasn't worked or you're just unlucky but it's got to midsummer and you have full blown dry patch. Where to from here?

Once it's at this stage the application of preventative or curative wetting agents alone will have minimal effect. At this point we need to look at curative wetting agents or those that aid water penetration then followed by preventative wetting agents, depending on where your problems lies.

If you're dealing with excessive thatch or fairy ring induced dry patch, a curative wetting agent thoroughly washed into the soil will be effective in breaking down the waxy residues. If you're dealing with low water infiltration or high run-off then a wetting agent to aid water penetration will have greater effect.

Once the dry patch has been fixed, remember the wetting agent isn't going to re-wet the soil profile for you. Additional irrigation (hand watering) and cultural practices will be required.

Hand watering. Targeted watering of difficult to re-wet areas prone to surface run-off will be required, the same logic applies to this too. Simply pouring water onto the affected area will result in washing

the product off the surface, repeated light applications for short intervals will achieve the best results. Monitor the soil profile to observe how far applied water has penetrated the soil profile.

Punch holes where required. In your most severe high spots or sloping greens getting the product into and through the top 20-30 mm is hard. Where such cases present themselves, simply throwing more product and irrigation at them will have minimal benefit. Focus on aiding the wetting agent and irrigation into the profile (not beyond it).

Observe the depth of your thatch layer and punch small holes (4-6 mm) into the thatch layer (not beyond) to create small pod-like capture chambers for water and wetting agent. From these, better surface water infiltration can be achieved.

Take care not to go too deep when dealing with full sand profiles as such spiking may cause the wetting agent to go beyond the problem zone.

Get the bucket out if necessary. Perhaps the most effective and resource efficient treatment of isolated dry patch is to simply insert a bottomless bucket or rings into the dry patch and fill with a wetting agent/water mix. Simply leave this until the water has infiltrated right through the soil profile. Using this method ensures all the wetting agent and water efficiently treats the dry patch and re-wets it.

Conclusion

The causes of isolated dry patch or hydrophobic soils are varied and so it is important to identify the exact type and nature of dry patch or hydrophobic soil before treating it.

Depending on the type or cause of dry patch you have, the condition will require specific products and treatments to tackle the issue. This might even involve different treatments on different areas of the green. Ensuring we use the correct product will significantly increase the effectiveness of the treatment. However, in many cases simply relying on the product alone to prevent/cure dry patch may lead to disappointing results.

Accompanying cultural practices such as spiking, watering in of the product and hand watering are every bit as important as the wetting agent application.

The correct wetting agent can be effective in preventing or curing dry patch if it is able to get through the soil profile, for it to do this, additional practices might be required.

Another example of dry patch



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