



Thatch and Fusarium Patch ...all about balance

Fusarium patch caused by the fungus *Microdochium nivale* is the most navel-gazed disease in golf course management, hardly surprising since *M. nivale* is the most important pathogen of temperate turf and Fusarium patch the number one disease in UK sports turf.

Fusarium patch attracts more cultural practices and fungicide applications than all other turf diseases put together with the prime aims of avoiding the disease or removing its presence from golf greens.

Greenkeepers can avoid and eradicate Fusarium patch but they

cannot remove the fungal pathogen. *M. nivale* is always present in turf usually as a saprophytic or weakly parasitic microbe living in the thatch, the dead and dying organic matter at the base of the turf grass sward.

Thatch is central to sports turf and Fusarium is inherent to thatch.

Everything else including the aggravating effects of environmental conditions, inappropriately timed management practices and the success or failure of fungicide application all comes back to a fungus with pathogenic potential residing in the thatch component of turf.

about the author



Dr Terry Mabbett

Dr Terry Mabbett is a disease, pest and weed control specialist with forty years international experience covering research, advisory and journalism. His current fields of focus are professional turf and alien insect pests and pathogens of Britain's native and naturalised trees.

Presence of the pathogen and solution to the disease lie in the thatch and how it is managed.

The intrinsic value of thatch set against harbourage of pathogens and promotion of disease is all about balance. You can't exclude thatch and why would you want to? Naturally occurring thatch at an appropriate depth and uniformity provides a natural resilience which contributes to the speed and consistency of play. It also acts as a singularly significant 'recycling bin' for natural nutrients (including nitrogen), released from decomposing organic matter and returned to the living grass plant tissue through the fibrous root system.

The *M. nivale* fungus resident in thatch and stirred by cooler and wetter conditions is presented with a new flush of foliar growth. The pathogen moves up through the gears into full parasitic mode with Fusarium patch disease as the invariable result. Most fungi are great lovers of surface moisture and high humidity and *M. nivale* is no exception. High thatch levels hold more moisture and generate more humid microclimates within the turf profile.

Feed turf by all means - but with fertiliser formulations rich in potassium to make the most of the 'gate-keeper' nutrient with its intrinsic abilities in good water relations and strengthening of grass plant tissues. The acid reaction generated by ferrous sulphate (iron sulphate) on the turf surface boosts resilience to Fusarium patch while deterring surface casting earthworms.

Hollow core tining and deep scarification are well worn methods for reducing thatch and conditions which exacerbate Fusarium patch.

However, collateral physical damage increases turf stress as well as providing entry points and infection sites for the pathogen. Advice given is generally against carrying out these invasive man-

agement practices when environmental indicators flag up periods of high pathogen activity and high sward susceptibility to Fusarium patch disease. Verti-cutting and top dressing offer less invasive thatch management options. Applying a systemic fungicide prior to hollow core tining or deep scarification is advisable.

The type of fungicide used and when to apply continues to be the most hotly debated topic in Fusarium patch control for sports turf.

Mowing is the reason why turf exists but it is easy to forget the impact of continual low cutting on turf and its susceptibility to disease.

Mowing will clearly stress out turf but also leaves behind grass leaves with open cut ends as prime points for entry of fungal pathogens including *M. nivale*. Another disease implication of mowing is removal of fungicide in the clippings, whether contact protectant fungicide on the surface of the severed leaf ends or systemic curative fungicide inside the leaf tissue.

On the plus side systemic fungicide inside the leaf tissue will exude in sap from the cut to provide a chemical barrier against infection by *M. nivale*. Evidence suggests

Fusarium and thatch 7 Soil profile from a golf green showing evidence of thatch accumulation on the right (Picture courtesy Syngenta)



escaping fungicide is washed down the sides of the leaves and re-enters the plant.

Chemical control of Fusarium patch is not a 'one fungicide fits all' scenario. It is clearly not advisable to rely on a contact protectant fungicide when grass is growing quickly because there will always be a high proportion on new unprotected leaf surface and because short interval mowing will be in place.

By the same token there is not much point in using a systemic curative fungicide when the grass is not actively growing because uptake of fungicide whether by the root system or through the leaves will be limited.

All things being equal a systemic fungicide taken up by either the leaves or the roots will provide a more effective option in relation to fungicide interception and absorption by the grass plant.

Recognition of thatch as central to the occurrence, development and severity of Fusarium patch is behind the latest development in turf fungicide technology and strategy.

Fludioxinal the active ingredient in Syngenta's Medallion targets and destroys *M. nivale* in organic matter (thatch) before it has chance to become Fusarium patch disease on the living green leaves.

Fludioxinal appears to alter the integrity and status of the selectively permeable membrane which bounds the spore. This results in rapid movement of water (by osmosis) into the spore causing it to rupture and burst.

Osmosis is the movement of small molecules such as water across a selectively permeable membrane from a higher concentration [of water molecules] to a lower concentration [of water molecules].

Fusarium patch has always been the number one target for new turf fungicides. It is not that long ago when Fusarium patch would most



likely be the only turf disease on the product label.

Control of anthracnose was essentially incidental and collateral to the primary effect of a broad spectrum acting fungicide on Fusarium patch disease.

Poa annua (annual meadow grass) continues to be the 'black sheep' of sports turf grasses with its intrinsic susceptibility to Fusarium patch and high thatch forming credentials. Greenkeepers worried about high percentages of *Poa annua* in their greens, and resulting implications for Fusarium, are advised to reduce annual meadowgrass in favour of bent and fescue.

Poa annua is even more suscep-

ABOVE: Widespread Fusarium patch beginning to dry out but the damage has already been done (Picture Courtesy Bayer Environmental Sciences)

ABOVE RIGHT: Fusarium and thatch 6 Grass leaves with Fusarium patch disease simply add to the thatch burden on golf greens (Picture courtesy Syngenta)

tible - and terminally so - to basal rot anthracnose. Some greenkeepers have traditionally turned a blind eye to anthracnose, reasoning that it will kill and clear out annual meadowgrass in what must have been one of the earliest examples of man-managed biocontrol in turf.

Most modern fungicides are equally effective against Fusarium patch and anthracnose so applications targeted at Fusarium will invariably control basal rot anthracnose at the same time, and therefore help to maintain the high thatch producing *Poa annua* component in a turf grass sward. It's all about balance.

Dig deep!

The Redexim Verti-Drain™ is the choice of championship golf courses and top flight sports clubs to keep their playing surfaces in tip top condition.

17 models make it the most comprehensive range of aeration equipment available - one to suit all applications such as high speed; deep tine; compact or contractor.

Find out more about our [Verti-Drain™](#) range today.



Designed for durability

Charterhouse™
TURF MACHINERY

www.charterhouse-tm.co.uk | 01428 661222



www.advancedtt.com

EVEN MORE ADVANCED

The incredible 22" INFINISystem™ now has a big brother – a 26" wide version with all the same attributes.

This wider model will increase productivity, whilst the floating head will ensure no compromise on undulating surfaces.

- 9 SMART cassettes for ultimate turf management
- 2 Power sources for maximum flexibility
- 2 Machine widths, 22" and 26" for more productivity



☆ aerate ✪ brush ✪ de-thatch ✪ groom ● level ✪ mow ✪ scarify ✪ top dress

