

Proactive disease management proves better than cure

Today's turf managers are under ever increasing pressure to deliver high quality playing surfaces all year round. Every golfer wants to putt on Augusta quality greens; every footballer to play on a Premiership pitch. Syngenta Technical Manager, Simon Watson, reports an outbreak of turf disease can ruin all the hard work put into preparing the best possible playing conditions, but proactive disease management can help preserve premium playing surfaces.

With autumn approaching, all greenkeepers will know the fear of waking up to find 'The Fus' (Fusarium Patch) has struck on a green that the previous day looked immaculate, or when summer Take-All patches continue to spread and look worse and worse every day.

The greenkeeper or groundsman is judged primarily on the quality of the surface presented; once the visible signs of disease occur and the surface starts to break down, there's precious little consideration from players for the difficult weather conditions, or the management constraints that have been imposed.

The simplest solution would be to routinely apply a broad spectrum fungicide every six to eight weeks at times of disease risk throughout the year. However, routine prophylactic treatments could rightly be called into question regarding the good stewardship of fungicides in use, and the economics of such a strategy are likely to prove prohibitive for all but the most intensively managed premium surfaces.

Protecting turf quality

That doesn't, however, make the application of a fungicide before symptoms are visible wrong, since the plant is often infected with disease for a considerable time before



about the author

Dr Simon Watson is the Syngenta Turf & Amenity Technical Manager for the UK and Ireland. He oversees the company's huge investment in turf R&D, as well as providing practical advice for greenkeepers, including the Syngenta turf website: www.greencast.co.uk

visual symptoms are seen. STRI trials have repeatedly shown that proactive disease management with fungicide applications made during periods of high risk - when disease is likely to already be developing in the leaf but before the visible signs of disease breakout - gives the most effective control and the best results for turf quality. Furthermore, Dr Ruth Mann has demonstrated that this approach can be successful in using fewer fungicide applications and at lower cost over the course of the season, compared to routine applications or treatment at the first signs of infection.

Understanding the disease pathogen life cycle will help turf managers assess the best time for



appropriate fungicide timing (Fig 1). Clearly targeting disease early to stop initial infection - preventing fungal spores from germinating and penetrating the leaf - will ensure that no visible damage occurs. Curative fungicides get to work after disease has got into the leaf, but before it has the chance to develop and cause visible damage; they cannot repair leaf tissue which is already dead due to the effects of disease, so applying them early in the disease development cycle is critical to the achievement of good results.

Once there are visible signs of attack and you are seeing blistering and lesions erupting, then fungicides with eradicant properties will be necessary to stop spore produc-

tion at this timing. At this point the preventative and curative elements of a fungicide have an essential function to protect surrounding clean leaves and to halt further spread.

The fact is that the most damaging disease pathogens are probably already present in your turf surfaces; they are just waiting for the conditions they favour in order to multiply - when the damage will be caused. The key for proactive disease management and the most effective fungicide use is to know when the conditions are right for the disease to develop and attack turf plants.

Fusarium Patch, for example, likes mild and moist conditions -

MAIN ABOVE LEFT:
Anthracnose Foliar Blight
ABOVE RIGHT:
Fusarium Close Up
BELOW RIGHT:
Take-All

Turf disease problems are on the increase:

- Earlier disease attacks
- More aggressive pathogens
- New diseases appearing
- Season long infection

being most prevalent in autumn and spring; with autumn attacks most damaging if turf is less able to grow and recover. However, a period of thundery, humid weather could cause a flare up at anytime over the summer. Irrigation could also exacerbate a problem. Anthracnose, by contrast, enjoys hot dry conditions.

If weather conditions have rumbled on at low risk levels for several days, the pathogen can still build up, even if there are no visible signs and the turf is still able to grow on apparently healthy. Just a short period of high risk weather could see infection explode. In this situation, proactive treatments ahead of the high risk periods knock down the pathogen population within the

turf and slow down its build up, ideally until after the risk conditions are past and the turf is once again safe.

Predicting risk

Today's forecasting systems for turf management are now far more sophisticated and well proven. The GreenCast disease models, have been validated for UK conditions and sports turf surfaces and are available free to turf managers and agronomists at www.greencast.co.uk.

Using localised weather and disease forecasting can enable turf managers to predict when their turf is likely to come under most intense disease pressure, and time their fungicide applications accordingly to prevent damage. Over 1500 turf managers are already signed up to GreenCast, with the five-day weather and disease forecast the most popular page, used by many on a daily basis to help with management decisions.

Some use the forecasting allied to their own 'indicator greens' - areas that tend to show up disease earlier than others and, when the symptoms are seen, trigger treatment across the course. It provides good validation and vindication that treatment was justified.

For some diseases, primarily soil borne fungi such as Take All and Fairy Ring, there is little real curative activity, so effective treatment has to take place before visible effects are seen. Application of approved fungicides when the symptoms are visible may help minimise the severity of the attack and help to limit its long-term spread, but to achieve good control turf managers need to be taking note of where Take-All patches are being seen and treating accordingly the following season.

Disease risk forecasting can again predict conditions where the pathogen will develop within the soil, enabling treatment before infection causes visible damage to turf. Although typically seen during June and July, changing weather patterns we are seeing attacks perpetuating through into September and October. These late attacks further compound the problems for turf managers, since there is little chance to reseed or aide recovery going into the winter.

Once the Take-All pathogen is in the soil, areas that suffered visible signs of disease should be treated in subsequent years if there is a medium risk of infection. But if the risk increases to high it would be judicious to treat all similarly

vulnerable areas around the course where the pathogen is likely to have spread.

One technique which has proven useful is to mark infection areas on a course map, so as to be able to treat the area if the risk increases in subsequent years. A further advance that is now readily available is to use a hand-held GPS to mark down affected spots and enable more precise monitoring and proactive preventative treatment in following seasons.

Appropriate fungicide choice

Disease risk forecasting also enables more appropriate fungicide choice. Most options are good on the most common Fusarium, but where Anthracnose, Dollar Spot or Take-All, for example, are also seen to be posing a potential risk, then selecting the right product can significantly enhance control. Turf managers also need to take into account the prevailing growing conditions, with systemic activity most appropriate when turf is actively growing - to move the fungicide within the leaf and protect new growth from infection - while contact fungicides can give good protection to leaf surfaces, as well as some with enhanced curative and eradicant activity.

The other crucial element of Integrated Turf Management (ITM) is to make conditions within the turf as inhospitable to disease pathogens as possible. Many diseases, including Fusarium Patch, thrive in the warm, damp conditions that occur within thatch; so aeration and scarification to open up the turf can significantly reduce the risk. Good drainage, removing surface moisture and allowing space so that turf can dry quickly in the morning will help.

Fertility and nutrition are also crucial to keep turf as healthy as possible and minimise impacts of disease. Strong turf is better able to withstand low levels of disease pressure and can recover faster from attacks. However, as with all cultural controls, there is the difficult balance between feeding that encourages vibrant green growth which can be more susceptible to Fusarium attack, for example, and leaving turf short of nutrients that will make it more vulnerable to Anthracnose.

Changing disease

The problems for turf managers are being further compounded by the changing nature of disease

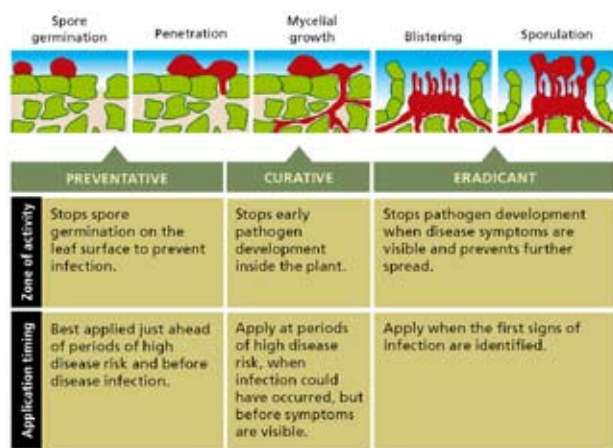


Fig 1: Foliar disease life cycles dictate the optimum time for different fungicide activity

Turf disease issues are being exacerbated by:

- Climate change
- Environmental pressures reducing options
- Player demand for ever higher quality turf

attacks. Fusarium remains the number one problem, but we are increasingly seeing high risk situations occurring through the summer with intense periods of heavy rainfall. The rising temperatures are also seeing Anthracnose infection occurring further north, along with Dollar Spot outbreaks on a wider scale. Take-All is also far more widespread, and is typically more severe and lasting for longer.

These changes in disease patterns are an ongoing process and unlikely to cause a major problem overnight, but turf managers must remain vigilant for different signs and be ready to act. It will have an effect on all the Integrated Turf Management practices that may be helping stop one disease, but exacerbating another. Stopping a pathogen at an early stage with proactive treatment is easier, and cheaper, than fighting a firebrigade action when it's out of control.

GreenCast

Decision support for fungicide selection

The interactive web-based decision support system - www.greencast.co.uk - provides valuable help with appropriate fungicide selection and timing of application.

GreenCast provides:

- Early warning of local disease risk - enabling preventative fungicides to be applied ahead of likely infection.
- Alerts of potential disease infection - for more effective curative product timing if an infection period has recently occurred.
- ITM disease profiles - for improved disease identification and effective eradicant product selection.