

A for anthracnose

Dr Terry Mabbett continues his examination of the country's most common turf diseases by looking at anthracnose.

'A' was for anthracnose in appearing in late autumn as a distinctive dark-coloured basal (crown) rot of *Poa annua* (annual meadow grass) as long shadows and brown leaves fell across the greens.

Dry and compacted summer-stressed swards refreshed by rain and flushed with nitrogen fertiliser resumed growth in earnest during October but so did the anthracnose fungus having lain 'dormant' in the thatch during the dry summer months.

Anthracnose was a definitive disease of autumn through to spring with root causes in stressed grass plants in dry and compacted summer swards but has since become a real conundrum. A form of anthracnose distinguished by different symptoms, and called foliar blight, now perversely appears in summer to affect a much wider range of turf grass species.

The fungus responsible (*Colletotrichum graminicola*) has suffered a recent illogical scientific name change. More than two dozen different species cause anthracnose (means 'like coal') on everything from mangoes to bananas but just four are associated with anthracnose in the family Graminae (grasses and cereals).

The four species are distinguished by small but distinct structural differences and discrete physiological differences which determine exact host range.

C. graminicola was associated with anthracnose across a broad range of grasses and cereals but more recent findings indicate *C. graminicola* exclusively attacks cereals and mycologists now say the species infecting turf grass is *Colletotrichum cereale*. In layman's language and understanding *C. graminicola* and

C. cereale are for all intents and purposes interchangeable.

Anthracnose is no longer exclusive to shortening days, cool nights and morning mists of late autumn but already up and running as foliar blight during the warm still 'Dog Days' of August and often earlier. Basal or crown rot remains closely associated with late autumn and is still essentially confined to *Poa annua* (annual meadow grass) but has been seen on *Agrostis*. The foliar blight form of anthracnose is much less discerning and affects most cool season turf grass species.

Anthracnose is now firmly established as the second most important disease of UK turf after *Fusarium* patch (*Microdochium nivale*). Contemporary anthracnose infection is heavier and active over a longer part of the season on a much wider range of turf grasses. Its recent rise up UK



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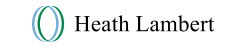
Greens are now at risk of anthracnose for most of the year, not just in late autumn and through to spring

turf disease rankings has resulted in a re-assessment of measures required to avoid, manage and control anthracnose including use of fungicides.

Gone are the days when anthracnose was purely a problem for autumn greens with a high percentage of *Poa* and only acted upon when disease symptoms appeared in October though present year-round in the thatch. Year-round vigilance and action to avoid and alleviate turf conditions and management practices which may aggravate anthracnose into action from its 'saprophytic' existence in thatch is required.

Basal rot and foliar blight

Basal rot anthracnose is generally a disease of cool wet autumns on close cut annual meadow grass swards, but also creeping bent grass (*Agrostis stolonifera*) in North America where it is called 'winter anthracnose'. Leaves turn yellow then orange/red due to the accumulation of specific pigments in the tissue and unmasked by destruction of normally



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overpowering green chlorophyll.

Closer inspection shows older leaves are affected first because the crowns suffer infection and necrosis from the outside inwards. The water-soaked bases of infected grass plant tillers are easy to pluck from the soil. At an advanced stage of infection erumpent conidia-containing structures called acervuli (singular is acervulus) appear as black stained areas at the base of the plant. This rotting and necrosis of the crown where new roots and buds are formed is the more serious of the two phases of anthracnose, which are basal rot and foliar blight.

Foliar blight was prevalent in North America long before it appeared and took off in the UK. Infection occurs, symptoms show and disease spreads during spells of high humidity with temperatures above 22°C, especially on turf struggling to grow over a dry root zone.

Water from summer showers or irrigation is repelled by the dry compacted surface of the root zone. Instead of percolating into the soil, moisture hangs around on the surface moistening and

raising humidity within the thatch to create ideal conditions for spore germination, leaf infection and the onset of foliar blight.

Patches of turf affected by foliar blight are yellow at first and then bronze with affected grass assuming a dull and darkened appearance. Annual meadow grass and creeping bent grass are the prime targets but smooth-stalked meadow grass (*Poa pratensis*) and creeping red fescue (*Festuca rubra*) are also affected.

Once liberated from the acervulus conidia are spread across the turf by rain splashes, air currents, machinery and footwear to infect previously healthy areas of turf. Dead tillers and plants killed by basal rot and leaves with foliar blight die back to become thatch, where *C. cereale* survives as a saprophyte until conditions are right for re-infection.

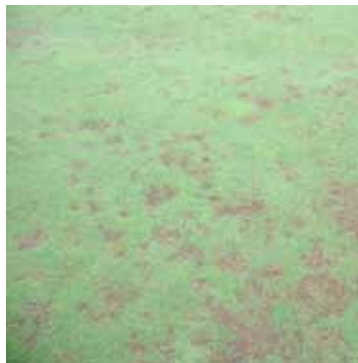
Arrival of typical autumn conditions with morning mists, rainfall and increasing cloud cover sets the scene for the resurrection of anthracnose. Free water on leaf surfaces and high humidity in the sward re-activates the fungal mycelium on the thatch and



Anthracnose damage on a green high in Poa (Poa annua var annua) (Photo courtesy Headland Amenity)



Close up on basal rot anthracnose of Poa annua (Photograph courtesy Headland Amenity)



The aftermath of anthracnose infection (Photograph courtesy Headland Amenity)



Detached tillers of Poa annua showing dark coloured basal rot due to anthracnose (Picture courtesy Bayer Environmental Science)

initiates a new cycle of infection.

Grass trying to grow out of stressful conditions including soil compaction, deep thatch and dry root zones is an easy target for anthracnose. Soft growth responding to rain and poorly balanced (high nitrogen) autumn fertiliser over deep wet and humid thatch can be very susceptible to anthracnose. And especially if the ground is compacted, poorly drained and turf cut inappropriately low for this time of the year.

Thatch, stress and anthracnose

Twin key factors underpinning anthracnose are the pathogen's propensity to invade stressed and damaged turf grass and year-round presence of the fungus on the thatch.

Even when turf is green and clean *Colletotrichum cereale*, like *Microdochium nivale*, is ticking over in a saprophytic or weakly parasitic mode on the dead and dying grass material comprising the thatch. Thatch in itself adds to turf sward stress if allowed to

become inappropriately deep, thick and matted.

Single most important biological factor aggravating anthracnose is the presence of *Poa annua* (annual meadow grass) in turf grass swards. Annual meadow grass is a fast-growing, high-thatch forming species that exploits and monopolises turf suffering from high compaction and physiological stress, the very conditions that make turf grass generally more susceptible to anthracnose infection. Turf carrying a high proportion of *Poa annua* with its high-thatch and high humidity baggage offers a broader and bigger base for anthracnose residence and persistence and a more attractive substrate for infection and spread.

Poa annua is present to some degree in many fine turf swards even if unwanted. The species is variously regarded as a useful turf grass species or a rough grass weed, depending on original status of the turf and the ultimate goal of the greenkeeper. *Poa annua* has always stirred mixed emotions amongst the green keeping fraternity with much time and

effort invested in reducing *Poa* and its accompanying high risk of anthracnose infection.

High humidity is a trigger for anthracnose infection so good aeration above and below the ground by scarification, compaction relief, aeration and swishing dew should all help to keep the disease at bay. But

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anthracnose is a weak wound parasite and too much of the very techniques used to improve aeration and root zone drainage and reduce humidity may make matters worse. Added stress weakens the turf and abrasions to grass stems and leaves offer easy points of access and entry for anthracnose.