

PRODUCING THE ULTIMATE PLAYING SURFACE



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Perform.**

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Syngenta would like to acknowledge the following individuals for their contribution to the development of this turf guide **Pete Dernoeden** PhD, University of Maryland USA, and **Bruce Clarke** PhD, Rutgers University USA.

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Necrotic Ring Spot

Causal Agent:

Ophiosphaerella korrae
formerly known as *Leptosphaeria korrae*

Susceptible Turfgrass:

Kentucky Bluegrass, *Poa Annua*,
Rough Bluegrass, fine-leaf Fescue

Symptoms:

Necrotic ring spot first appears as small light green spots and progresses to thinned, circular patches that are yellow to light-green in colour and approximately 8 to 40 cm in diameter. The patches, which can expand up to 1 metre in diameter, eventually turn brown or straw-coloured and die. The roots and rhizomes of the affected turfgrass turn brown to black. Grass plants can survive and recolonise the centre of the patches, which leads to a ring-like appearance.

Conditions Favouring Disease:

Necrotic ring spot initiates in moist soil, thrives in temperatures of up to 27°C and becomes more severe in higher temperatures and drought conditions. Seeded sites, as well as sodded sites in newly cleared woodlands, are susceptible to this disease. It is also found in areas with compacted soil and that are high in nitrogen during the Spring and Summer.

Integrated Turf Management Tips:

- Raise mower height
- Reduce soil compaction through aeration and use of lightweight equipment
- Use moderate to high amounts of phosphorous and potash
- Maintain adequate nitrogen and a balanced fertility
- Minimise the amount of shade
- Lightly irrigate (approximately 2.5 mm) in the mid-afternoon on a daily basis to cool plants
- Avoid drought stress
- Top-dress and aerate turf as needed
- Reduce thatch
- Overseed with Perennial Ryegrass or more tolerant Bluegrass cultivars
- Apply penetrant fungicides on a preventive basis



Necrotic Ring Spot

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **HeadwayMaxx**[®]
Turf fungicide

Spring Dead Spot

Causal Agent:

Ophiosphaerella korrae, Ophiosphaerella sp.
formerly known as Leptosphaeria sp.

Susceptible Turfgrass:

Bermudagrass, Buffalograss and Kikuyu

Symptoms:

Infected Bermudagrass shows disease symptoms as it emerges from Winter dormancy. Spring dead spot appears as bleached, straw-coloured, circular patches that measure up to several feet in diameter. The roots of affected plants turn dark brown to black.

Conditions Favouring Disease:

Spring dead spot favours cool, wet weather in the Spring and Autumn and daily temperatures of less than 16°C in May. This disease is typically found where thatch is more than 1.2 cm thick and in locations with poor drainage and low potash levels. Heavy applications of nitrogen in late Summer often increase disease severity the following Spring. Spring dead spot is more severe on Bermudagrass that is over three years old and in locations with long dormancy and cold temperatures.

Integrated Turf Management Tips:

- Avoid late Summer or Autumn applications of nitrogen fertilisers which may enhance disease severity
- Use ammonium sources of nitrogen combined with potassium for fertiliser from Spring through early August
- Control weeds in affected turf to enhance recovery from Spring dead spot
- Apply moderate to high levels of phosphorous, potash, and minor elements
- Improve drainage of turf
- Reduce thatch
- Convert from common varieties to hybrid Bermudagrass with good Winter hardiness
- Use preventive fungicide applications in late September or October



Spring Dead Spot

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **HeadwayMaxx**[®]
Turf fungicide



Spring Dead Spot

During the early stages of this disease, the inside of the patches remains alive, but die off as the infection progresses. The entire plant structure inside these rings dies, including the shoots, rhizomes and roots. Regrowth in these dead areas must occur from the expansion of surrounding healthy plants and is very slow. The rings often fill with weeds or with stunted new turf plants.

Symptoms

- Circular patches of bleached, straw coloured dead grass appear in Spring as the dormant grass resumes growth.
- Patches are a few centimetres to 1m in diameter.
- Patches reappear and expand in the same spot for 3 or more years.
- Roots of affected plants turn dark brown to black and are severely rotted.



Conditions Favouring Disease

- Most active when temperatures are cool (12 to 14°C) and soil is moist.
- This disease is typically found where thatch is more than 1.2cm thick and in locations with poor drainage and low potassium levels.
- Heavy applications of nitrogen in late summer often increase disease severity the following spring.
- Spring Dead Spot is more severe on turf that is over three-years old and in locations with long dormancy and cold temperatures.

Banner: # 1 Spring Dead Spot control

Spring Dead Spot:

(Kikuyu Patch - Treat in Autumn)

Although the symptoms of this disease are seen in spring it needs to be treated in Autumn.

PREVENTATIVE:

Banner 2 litres/ha in March & follow up 21 days later

CURATIVE:

Banner 4 litres/ha in March & follow up 21 days later

Summer Patch

Causal Agent:

Magnaporthe poae

Susceptible Turfgrass:

Poa Annua, Kentucky Bluegrass, and fine-leaf Fescue

Symptoms:

Summer patch appears as circular or irregularly shaped patches that measure from several inches to several feet in width. Initially, patches appear as slow-growing thinned or wilted turfgrass. Mature patches are brownish-yellow to straw-coloured and can coalesce as they increase in size. The leaves of the plant turn yellow to brown from the tip to the base. The roots turn moderate to dark brown. Summer patch can exhibit a ring-like appearance where a less susceptible grass species survives inside the diseased patch.

Conditions Favouring Disease:

Root infection is initiated when soil temperatures exceed 18°C; however, foliar symptoms of Summer patch are favoured by temperatures over 29°C during the day and over 21°C at night. It is also commonly found in areas that are sunny, exposed, and with high soil moisture, high soil pH, compaction, poor drainage, and low mowing height. This disease is typically more severe in turfgrass that has been fertilised with nitrate-nitrogen.

Integrated Turf Management Tips:

- Use acidifying fertilisers
- Increase the height of cut
- Reduce soil compaction through aeration and use of lightweight equipment
- Syringe when the temperature is over 29°C
- Improve the drainage of the turf
- Convert to resistant species, such as tall Fescue, Bentgrass, or Perennial Ryegrass
- Apply fungicide preventively in Spring



Summer Patch as seen from 3 m and 6 m (top)

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Take-all Patch

Causal Agent:

Gaeumannomyces graminis var. avenae

Susceptible Turfgrass:

Bentgrass

Symptoms:

Take-all patch symptoms initially appear as small, circular reddish-brown spot patches. Symptoms will progress to wilted, circular patches that are brown or bronze-coloured and can measure up to several feet in diameter. Symptoms are most evident during periods of stress induced by hot, dry weather. Infected plants have dark-brown roots.

Conditions Favouring Disease:

Take-all patch is most common on newly established turf and severity decreases as the turf stand matures. It will occur on sites that have light textured soils, low organic matter content, manganese deficiency, and pH above 6.5. Take-all patch typically occurs in cool, wet conditions and in areas with a high soil pH—most severe at pH 6.5 or above. This disease is more severe on less fertile and sandy soil.

Integrated Turf Management Tips:

- Use acidifying fertilisers
- Apply moderate to high levels of phosphorus, potash, and minor elements where these nutrients are depleted from the soil
- Improve the drainage of the turf
- Reduce thatch
- Improve drainage
- Apply penetrant fungicides in the early Spring after the first mowing and in the late Summer or Autumn



Take-all Patch as seen from 3 m (top) and 6 m

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **HeadwayMaxx**[®]
Turf fungicide

Fairy Ring

VARYING CAUSES AND SYMPTOMS

Three types of fairy ring symptoms can change the appearance and/or health of turfgrass.



TYPE I SYMPTOMS

Damaged or dead turf from drought stress.

CAUSES:

- Hydrophobic (water-repellent) thatch and soil.
- Accumulation of ammonium to toxic levels.
- Release of hydrogen cyanide or other toxins into the root zone.



TYPE II SYMPTOMS

Rings of dark green or quickly growing turf. These symptoms usually occur early in the season, and indicate that more severe Type I symptoms may follow. They are most evident in under-fertilized turf.

CAUSE:

- The release of nitrogen and other nutrients into the soil.



TYPE III SYMPTOMS

Mushrooms or other fruiting bodies produced in a ring. They are most common during periods of wet weather preceded by drought.

CAUSE:

- Mycelial mass buildup around the outer ring.

Although Type II and III symptoms are not devastating to turf, they do detract from uniformity and can affect playability.

Both warm and cool-season grasses are susceptible to fairy ring, and the disease is most damaging in the sandy soils that are preferred for putting greens. By creating optimal playing conditions for the golfer, we also create optimal growing conditions for fairy ring pathogens.

KEYS TO EFFECTIVE FAIRY RING CONTROL:

- Maintain regular, preventive applications with Heritage Maxx throughout the season.
- Initiate applications early in the season when soil temperatures reach 12°C to 15°C.
- Deliver the active ingredient to the infested zone of the soil profile.
- Apply soil surfactants regularly to maintain soil conditions and turf health.
- Preventive fungicide applications do not require tank-mixing with a soil surfactant, but curative applications generally do.
- Determine how deep fairy ring infestation is for watering-in product applications.
- 2.5 – 3.8 mm of irrigation is needed if limited to the thatch layer.
- 6.3mm of irrigation if 50-80mm deep in soil.
- Repeat applications on regular intervals to maintain consistent suppression in the soil.

Fungicides are a long-term, preventive approach, not a short-term fix.

Approved products:

 **Heritage Maxx**
Turf fungicide

 **Qualibra**
Wetting agent

 **Headway Maxx**
Turf fungicide

Superficial Fairy Ring

Causal Agent:

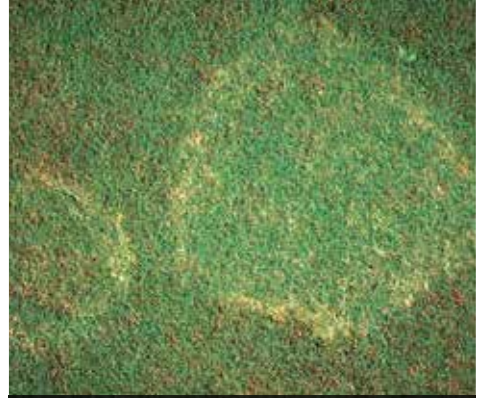
Coprinus kubickae, *Melanotus phillipsii*, *Trechispora alnicola*, *Trechispora cohaerens*, *Trechispora farinacea*, other species

Susceptible Turfgrass:

All species of warm- and cool-season turfgrass

Symptoms:

Symptoms vary depending on the type of superficial fairy ring. This disease can cause patches with felted, white mycelium. Sometimes the patch is sunken and has a ring that measures approximately 2.5 cm wide at the border. Also, the lower leaves on the turfgrass in the affected areas can die.



Superficial Fairy Rings as seen from 3 m

Conditions Favouring Disease:

Superficial fairy ring is favored by the summer season for cool-season turfgrass. For areas where warm-season turfgrass is the principle turfgrass species and dormancy is sporadic or doesn't occur, superficial fairy ring can be a common problem. While the patches typically disappear in the cool seasons for cool-season turf or in the summer for warm- season turf, they can remain if the turf is not properly managed.

Integrated Turf Management Tips:

- Maintain adequate fertilization to minimize symptoms
- Reduce thatch by vertical cutting and aerifying
- Topdress and cultivate turf to control mat and thatch
- Improve soil drainage
- Increase mowing height

Approved products:

 **HeritageMaxx[®]**
Turf fungicide

 **Headway[®]Maxx**
Turf fungicide

Powdery Mildew

Causal Agent:

Erysiphe graminis

Susceptible Turfgrass:

Kentucky Bluegrass, fine-leaf Fescue, Bentgrass, Ryegrass, and Bermudagrass

Symptoms:

The disease first appears on the leaves as individual tufts of fine, white mycelium. The tufts enlarge and coalesce, causing the leaves to have a greyish-white or powdery appearance. Severely infected turf turns yellow, then tan and brown in colour. Stressed turf that is severely infected can die. Severely infected turf, especially in shaded areas, can become thinned.

Conditions Favouring Disease:

Powdery mildew is favoured by humid, cloudy weather with temperatures between 15°C and 22°C. It occurs in areas under stress, with low light, and with high humidity. Powdery mildew is also common in areas with poor air circulation, but does not require a film of water to infect turf.

Integrated Turf Management Tips:

- Water as needed to avoid drought stress
- Avoid levels of nitrogen and irrigation that produce lush leaf growth
- Raise the mower height
- Prune tree limbs to improve air circulation and the amount of sunlight
- Convert to a polystand of shade-adapted turfgrass



Powdery Mildew

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **HeadwayMaxx**[®]
Turf fungicide

Pythium Blight

Causal Agent:

Pythium aphanidermatum, other *Pythium* species

Susceptible Turfgrass:

All turfgrass species, especially Annual Bluegrass, Perennial Ryegrass, Bentgrasses, and tall Fescue and Bermudagrass

Symptoms:

Pythium blight appears suddenly during hot, humid weather. This disease causes greasy, brown circular spots that are initially about 2 cm to 5 cm in diameter and then rapidly enlarge in size. The spots are water-soaked and dark-coloured early in the morning. They also form fluffy white masses of fungal mycelium (cottony blight) and can coalesce to form large, irregular areas of dead turf. Infected patches may appear brownish-orange in colour.

Conditions Favouring Disease:

Pythium blight favours night temperatures of over 20°C. It occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days. It is found in the wettest areas of turf and in areas with poor drainage and air circulation. Lush-growing turf growing under nitrogen fertilisation is particularly susceptible to the disease.

Integrated Turf Management Tips:

- Avoid mowing wet turf when the foliar mycelium is evident to minimise spreading the disease
- Reduce thatch
- Avoid excessive nitrogen application during hot weather
- Increase air circulation to speed the drying process of the turf
- Minimise the amount of shade
- Irrigate turf early in the day. Avoid late-day watering
- Improve soil drainage
- Irrigate turf deeply and as infrequently as possible



Approved products:

 **HeritageMaxx[®]**
Turf fungicide

 **Headway[®]Maxx**
Turf fungicide

 **SubdueMaxx[®]**
Turf fungicide

Pythium Root Rot (Root Dysfunction)

Causal Agent:

Pythium aphanidermatum, *Pythium aristosporum*, *Pythium graminicola*, *Pythium vanterpoolii*, other *Pythium* species

Susceptible Turfgrass:

Species grown on putting greens, such as Annual Bluegrass, Bentgrass, and Bermudagrass

Symptoms:

Pythium root rot is common on highly maintained turf, such as golf course greens. Although symptoms of *Pythium* root rot are typically non-distinctive, this disease can appear as yellow, irregularly shaped patches. The affected turfgrass is thin, off-colour, and slow growing, while the root system is stunted with reduced volume and vigour. Foliar mycelium does not occur.

Conditions Favouring Disease:

Some *Pythium* species favour temperatures between 0°C and 10°C while others thrive in temperatures between 21°C and 32°C. *Pythium* root rot occurs in areas with high soil moisture, poor drainage, and low light. It also infects locations with low mowing height and excessive wear.

Integrated Turf Management Tips:

- Increase the height of cut
- Apply optimum amounts of nitrogen, phosphorous, and potash
- Reduce mowing frequency and use lightweight mowers
- Avoid overwatering
- Apply low amounts of nitrogen in the Spring when roots are forming
- Minimise the amount of shade
- Improve the drainage of the turf
- Reduce soil compaction
- Apply penetrant fungicides on a preventive basis



Pythium Root Rot

Approved products:

 **HeritageMaxx[®]**
Turf fungicide

 **Headway[®]Maxx**
Turf fungicide

Brown Patch

Causal Agent:

Brown Patch: *Rhizoctonia solani*

Susceptible Turfgrass:

Poa Annuua, Bahiagrass, Bermudagrass, Centipedegrass, Colonial Bentgrass, Creeping Bentgrass, Fine-leaf Fescues, Kentucky Bluegrass, Meadow Fescue, Perennial Ryegrass, Kikuyu, Tall Fescue, Velvet Bentgrass, Zoysiagrass

Symptoms:

The symptoms of brown patch can vary depending on the grass cultivar, climatic and atmospheric conditions, soil, and intensity of the turfgrass management. This disease typically causes rings or patches of blighted turfgrass that measure 12 cm to more than 3 m in diameter. It also causes leaf spots and “smoke rings”—thin, brown borders around the diseased patches that appear most frequently in the early morning. After the leaves die in the blighted area, new leaves can emerge from the surviving crowns. On wide-bladed species, leaf lesions develop with tan centers and dark brown to black margins.

Conditions Favouring Disease:

Brown patch favours high relative humidity as well as temperatures of over 30°C during the day and over 15°C at night. This disease can be quite active at cool temperatures on warm-season grasses in the Spring and Autumn as temperatures in the turfgrass canopy, which is where infection starts, can often exceed air temperatures. It also occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days. Brown patch infestation is more severe when the turf is cut to a height less than the optimum for that turfgrass species.

Integrated Turf Management Tips:

- Use low to moderate amounts of nitrogen, moderate amounts of phosphorous, and moderate to high amounts of potash
- Avoid nitrogen applications when the disease is active
- Increase the height of cut
- Increase the air circulation
- Minimise the amount of shade
- Irrigate turf early in the day
- Improve soil drainage
- Reduce thatch
- Remove dew from turf early in the day



Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Rhizoctonia Leaf & Sheath Spot

Causal Agent:

Rhizoctonia zeae and *Rhizoctonia oryzae*

Susceptible Turfgrass:

All species of warm- and cool-season turfgrass

Symptoms:

The symptoms of Rhizoctonia leaf and sheath spot can vary dramatically depending on the grass cultivar, climatic and atmospheric conditions, soil, and intensity of the turfgrass management. This disease typically causes thinned areas resembling scalped areas or semi-circular thinned rings in warm-season turfgrass and can also be commonly confused with fairy ring or hydrophobic areas. In cool-season turfgrass, small patches of blighted turfgrass that measure 12 cm or more in diameter may exist in conjunction with brown patch. The disease can often have a darker red/orange hue to the infected turfgrass. Leaf spots may, but oftentimes do not, occur. These thin areas can also be slower to respond to fungicides as the disease is most active at high temperatures which can impede turfgrass re-growth.

Conditions Favouring Disease:

Infection from the pathogens that cause Rhizoctonia leaf spot is not as fast as with brown patch or large patch (*R. solani*), nor does it occur in the same conditions. Infection is most favoured by high canopy temperatures of 28°–36°C. This disease can be quite active in the heat of the Summer as temperatures in the turfgrass canopy exceed the 37°C range. Turfgrass that is stressed from drought and over-reliance on irrigation with poor quality water high in carbonates and salinity is more subject to infection. This can be a seemingly hot, dry weather disease as only humidity or moisture within the crown is necessary for infection.



Rhizoctonia Leaf & Sheath Spot

Integrated Turf Management Tips:

- Avoid nitrogen applications when the disease is active
- Increase the height of cut on greens, especially during drought conditions
- Increase the air circulation
- Irrigate turf early in the day
- Manage leach salts periodically with heavy irrigation events
- Reduce thatch
- Use fans when practical to improve air flow and lower canopy temperatures
- For best results, use contact or penetrant fungicides to prevent brown patch

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Yellow Patch/Cool Season Brown Patch

Causal Agent:

Rhizoctonia cerealis

Susceptible Turfgrass:

Bentgrass, Poa Annua, Perennial Ryegrass, Bermudagrass

Symptoms:

The symptoms of yellow patch (cool season brown patch) can vary depending on the grass cultivar, climatic and atmospheric conditions, soil, and intensity of the turfgrass management. This disease occurs from the Autumn through the Spring or as the warm-season grasses approach or break dormancy, generally when air temperatures average 19°–18°C. It causes rings and patches or circular patches that are yellow, light-brown, or reddish-brown in colour and that measure 12 cm to several feet in diameter. Leaf lesions rarely occur and grey “smoke rings”—thin borders around the diseased patches—sometimes occur. Damage is generally superficial, but thinning can occur during prolonged periods of wet weather in late Winter and early Spring.

Conditions Favouring Disease:

Yellow patch favours temperatures less than 15°C. It also occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days. This disease is more severe in turfgrass with excessive thatch and high nitrogen levels.

Integrated Turf Management Tips:

- Improve soil drainage
- Use low to moderate amounts of nitrogen, moderate amounts of phosphorous, and moderate to high amounts of potash
- Increase the air circulation
- Minimise the amount of shade
- Reduce thatch
- Use contact or penetrant fungicides preventively for best results



Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **DaconilWeatherstik**[®]
Fungicide

 **Headway**[®]**Maxx**
Turf fungicide

 **Instrata**[®]
Turf fungicide

Rusts: Crown, Leaf and Stem

Causal Agent: Crown—*Puccinia coronata*; Leaf—*Uromyces dactylidis*; Stem (Black)—*Puccinia graminis*; Stripe (Yellow)—*Puccinia striiformis*

Susceptible Turfgrass:

Kentucky Bluegrass, Poa Annua, Ryegrass, Old Bentgrass cultivars, Bermudagrass, and tall and fine Fescue

Symptoms:

Rust diseases cause light yellow flecks initially on the leaf blades and sheaths. The flecks enlarge, elongate, and turn yellow in colour. The infected areas rise above the epidermis and then rupture, releasing spores that are yellowish-orange to reddish-brown in colour. The leaf blade turns yellow starting at the tip and progressing to the base sheath. A severe disease infection can cause the shoot to turn yellowish to reddish-brown in colour and slow in growth. The turf may appear thin as individual shoots die.

Stem Rust



Rust disease from 3 m

Conditions Favouring Disease:

Rust diseases typically occur in early Spring through Autumn, depending on the location of the turf. Rusts favour moist, low-light areas. Depending on the species, rusts favour temperatures between 18°C and 30°C. Severe rust infections occur on slow-growing turfgrass, particularly those with low nitrogen levels and/or plant water stress.

Integrated Turf Management Tips:

- Convert to a turfgrass species or cultivar (especially for Kentucky Bluegrass and Perennial Ryegrass) that are resistant to rust diseases found in the area
- Apply adequate levels of nitrogen
- Remove clippings from turf
- Reduce thatch
- Reduce shade and improve air circulation
- Regulate irrigation to minimise the amount of time moisture remains on the leaf surface. Water deeply and infrequently
- Use penetrant fungicides to control rust diseases on slow-growing grasses and to grasses that are not mown

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Anthracnose

Causal Agent:

Colletotrichum cereale
(formerly *Colletotrichum graminicola*)

Susceptible Turfgrass:

Poa Annua, Creeping Bentgrass,
Kentucky Bluegrass, Fine-leaf Fescue,
Perennial ryegrass, Bermudagrass

Symptoms:

Anthracnose is most destructive during warm weather. It causes irregularly shaped patches that are yellow to brown in colour. Leaf lesions that are yellow with black centers may also occur. Anthracnose also causes a basal stem rot from late Winter to Autumn. Infected shoots are easily detached. The dead foliage and stems also become covered with acervuli—tiny, spined, black fruiting bodies—that require magnification to identify.



Anthracnose as seen up close (top) and from 6 m

Conditions Favouring Disease

Greens established with Poa Annua or susceptible varieties of creeping bentgrass can be attacked by Anthracnose throughout the entire growing season. In creeping bentgrass putting greens, the basal rot form of the disease is most active during hot weather in the summer, whereas the foliar blight is most common during cool and cloudy conditions. The opposite is true on Poa Annua, with the basal rot being most severe in cool, cloudy weather and the foliar blight more common during hot, dry weather. The fungus may also survive as darkly pigmented aggregates of hyphal cells (stromata) that are formed on stolons and at the base of tillers. Exposure of the stromata to sunlight and moderate temperatures of **15 to 25°C (59 to 77°F)** can induce formation of conidia. The conidia may serve as initial inoculum for basal rot Anthracnose in the spring or early summer.

Integrated Turf Management Tips:

- Increase the height of cut
- Minimise stress by using walk-behind mowers
- Decrease the amount of foot traffic
- Maintain adequate nitrogen and a balanced fertility level
- Irrigate the turfgrass just enough to prevent wilting
- Do not core aerate while disease symptoms are present
- Core aerate and overseed in the Autumn
- Convert from Annual Bluegrass to less susceptible varieties of turfgrass in the fairways
- Make preventive fungicide applications where the disease is a chronic problem

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **DaconilWeatherstik**[®]
Fungicide

 **Headway**[®] **Maxx**
Turf fungicide

 **Instrata**[®]
Turf fungicide

Best Management Practices (BMP) for Anthracnose control:

Rutgers University research has shown that using Banner + Daconil and Heritage Maxx + Daconil, one can prevent and control Anthracnose. However, BMP (Best Management Practices) are equally important:

- Maintain optional moisture levels (using a moisture metre is a great way to achieve this).
- Reduce leaf wetness periods.
- Regular dusting (this significantly reduces Anthracnose severity as you are protecting the crown of the plant).
- Rolling (up to 3 times per week).
- Rather reduce mowing height than cut back on N.
- Apply a granular application of N in spring and then maintain the nitrogen levels with 18 - 22,5 kg of N/ ha per week in early spring and reduce to 4kg /ha per week in late spring and summer.
- Maintain good nitrogen (3,6 % in the leaf) and potassium levels.
- Potassium Nitrate is a good source of N (avoid Potassium Chloride, Ammonium sulphate and Ammonium Nitrate).
- Maintain of soil pH of 6.
- Primo Maxx (apply 0.3 - 0.6 l/ha) – every 7-14 days during the growing season. Primo Maxx not only allows you to maintain your greens speed, but has also reduced the disease severity unlike the competitor products.

Keys products for Anthracnose prevention and control:

- Optimum water volume is 750 l/ha when targeting Anthracnose – good nozzles are also part of the secret to success.
- Daconil Weatherstik – research has shown you require lower rates every 14 days – generic products require more regular applications at higher rates. Best results with a tank mix of Banner/Daconil and HeritageMaxx/Daconil. The mixes work better as there are more than 12 strains of Anthracnose per green and different strains have different resistance levels to different chemistry.



Dollar Spot

Causal Agent:

Sclerotinia homoeocarpa

Susceptible Turfgrass:

Poa Annua, Bahiagrass, Bermudagrass, Centipedegrass, Fine-leaf Fescue, Colonial Bentgrass, Creeping Bentgrass, Perennial Ryegrass, Kentucky Bluegrass, Creeping and Spreading Fescue, Kikuyu, Velvet Bentgrass, Zoysiagrass.

Symptoms:

Dollar spot causes sunken, circular patches that measure up to 5 cm in diameter on golf greens and several inches on higher mown turf. The patches turn from brown to straw colour and may eventually coalesce, forming irregularly shaped areas. Infected leaves may display small lesions that turn from yellow-green to straw colour with a reddish-brown border. The lesions can extend the full width of the leaf. Multiple lesions may occur on a single leaf blade.



Dollar Spot as seen from 3 m (top) and 6 m

Conditions Favouring Disease:

Dollar spot is favoured by temperatures between 15°C to 30°C and continuous high humidity. This disease is particularly favoured by warm days, cool nights, and intense dews. It also infects areas with low levels of nitrogen and becomes more severe in dry soils.

Integrated Turf Management Tips:

- Use an adequate level of nitrogen, particularly in the Spring and early Summer
- Mow grass at regular intervals
- Reduce thatch
- Increase the air circulation
- Irrigate turf deeply and as infrequently as possible to avoid drought stress
- Remove dew from the turf early in the day
- Convert to a turfgrass cultivar (especially for Bentgrass) that is more tolerant to dollar spot
- Apply contact and/or penetrant fungicides on a preventive basis

Approved products:

 **Banner**[®]
Fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **Headway Maxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Fusarium Patch (Microdochium Patch)

Causal Agent:

Microdochium nivale (same species that causes pink snow mold)

Susceptible Turfgrass:

Most species of cool-season turf

Symptoms:

Fusarium patch causes patches that are yellow or reddish-brown in colour and 2.5 to 15 cm in diameter. The periphery of the patches are reddish-brown or pink in colour. “Smoke rings”—thin, brown borders around the diseased patches that appear only in the early morning—can occur. The patches occur in cool, wet weather. Blighting in streaks can also occur as a result of spore tracking on equipment wheels.

Conditions Favouring Disease:

Fusarium patch thrives in temperatures less than 15°C (but above 0°C) and in locations that experience more than 10 hours a day of foliar wetness for several consecutive days. It also favours areas high in nitrogen fertility and low in phosphorous and potash. *Fusarium* patch also infects areas with slow growing conditions and heavy thatch. *Microdochium nivale* is termed *Fusarium* patch when it occurs in the absence of snow cover.

Integrated Turf Management Tips:

- Maintain balanced fertility but avoid urea sources of nitrogen
- Avoid using lime. Alkaline soils enhance disease development
- Increase air circulation to speed turf’s drying process.
- Minimise the amount of shade
- Reduce thatch
- Apply fungicides prior to or at the first signs of disease. Turf recovery is more likely in the Autumn
- Make additional fungicide applications as needed during the Winter. Turf recovery is slow during the Winter so maintain a fungicide program to reduce turf damage



Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **Headway**[®] **Maxx**
Turf fungicide

 **Instrata**[®]
Turf fungicide

Grey Leaf Spot

Causal Agent:

Pyricularia grisea

Susceptible Turfgrass:

Kikuyu, Perennial Ryegrass, tall Fescue, and Centipedegrass

Symptoms:

The symptoms of grey leaf spot vary depending on the grass cultivar. On Kikuyu, grey leaf spot first appears as small, brown spots on the leaves and stems. The spots quickly enlarge to approximately 0.5 cm in length and become bluish-grey in colour and oval or elongated in shape. The mature lesions are tan to grey in colour and have depressed centers with irregular margins that are purple to brown in colour. On Perennial Ryegrass and tall Fescue, symptoms first appear as small, water-soaked lesions that turn brown. Lesions may have a yellow halo. The leaf tips will have a twisted or fishhook shape.

Conditions Favouring Disease:

Grey leaf spot favours temperatures between 26°C to 32°C. It is also found in areas with high nitrogen levels and that are stressed by various factors, including drought and soil compaction. This disease is most severe during extended hot and humid periods.

Integrated Turf Management Tips:

- Avoid medium to high nitrogen levels during mid-Summer
- Irrigate turf deeply and as infrequently as possible to avoid water stress
- Allow water to remain on leaves for only a short period of time
- Reduce thatch by vertical cutting
- When possible, plant turfgrass that is resistant to grey leaf spot
- Avoid using herbicides or plant growth regulators when the disease is active
- Apply penetrant fungicides on a preventive basis



Grey Leaf Spot

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **DaconilWeatherstik**[®]
Fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Leaf Spot/Melting-Out

Causal Agent:

Drechslera spp. and/or *Bipolaris* spp.

Susceptible Turfgrass:

Creeping red Fescue, Kentucky Bluegrass, Poa Annuua, Perennial Ryegrass, tall Fescue, and some varieties of Bentgrass and Bermudagrass

Symptoms:

Leaf spot (melting-out) causes purplish-brown to black spots with tan centers on the leaf blade and sheath. The lower leaves of the infected plants become shriveled and blighted. When melting-out infection is severe, almost all of the leaves and tillers die, causing severe thinning of the stand—or melting-out. On cool-weather turfgrass, melting-out typically follows the appearance of leaf spots.



Conditions Favouring Disease:

Leaf spot favours temperatures between 4°C and 26°C. It occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days. It also favours high amounts of nitrogen and a low mowing height.

Integrated Turf Management Tips:

- Increase the height of cut
- Reduce turf stress by using lightweight equipment.
- Avoid the application of high rates of water-soluble nitrogen in the Spring
- Minimise the amount of shade
- Irrigate turf deeply and as infrequently as possible
- Reduce thatch in the early Spring or Autumn for cool-season turfgrass and in the Summer for warm-season turfgrass

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Bipolaris and Drechslera (previously classified as Helminthosporium fungi). Helminthosporium sp. are on the Daconil label.

Red Thread

Causal Agent:

Red Thread—*Laetisaria fuciformis*

Susceptible Turfgrass:

All turfgrasses, but particularly severe on fine-leaf Fescue, and Perennial Ryegrass

Symptoms:

Red Thread causes patches that are reddish-brown in colour and 2.5 to 10 cm in diameter up to 0.5 m.

Conditions Favouring Disease:

Red thread thrives in temperatures between 4°C to 29°C and in locations that are low in nitrogen. It also occurs in areas that experience more than 10 hours a day of foliar wetness for several consecutive days.

Integrated Turf Management Tips:

- Mow turf frequently and collect clippings to remove diseased portions of the leaves
- Maintain adequate nitrogen and a balanced fertility
- Apply moderate to high amounts of phosphorous and potash
- Maintain the soil pH between 6.5 to 7.0
- Reduce shade
- Increase the air circulation to the turf's drying process
- Irrigate turf deeply and as infrequently as possible
- Use fungicides to control disease when it is a chronic problem



Red Thread at 6 m

Approved products:

 **Banner**[®]
Fungicide

 **HeritageMaxx**[®]
Turf fungicide

 **Daconil Weatherstik**[®]
Fungicide

 **HeadwayMaxx**[®]
Turf fungicide

 **Instrata**[®]
Turf fungicide

Fungicide Overview

In Brief

Turf diseases are becoming more aggressive and causing greater damage

Demands for ever higher quality turf create greater pressure for more effective control

Turf managers need to adopt new strategies to cope with disease

Appropriate use of the right fungicide at the right time will minimise damaging effects

New disease forecasting systems enable better disease control programmes

Knowing the stage at which a fungicide is most active is important in deciding the optimum application timing and the suitability for different situations. The Syngenta fungicide portfolio has a selection of products to counter the key stages of disease development.

Preventative

The optimum timing for fungicide application and action. Fungicides applied at this stage stops disease entering the leaf and attacking the plant.

Curative

Fungicides with curative activity tackle disease early in its life cycle. Symptoms of disease attack will not be visible on the leaf surface at this stage. If fungicides with curative activity are already present in the leaf, further disease development may be stopped. However, if only applied at this stage, by the time the fungicide takes effect disease symptoms may have developed. In most cases this is the final opportunity to gain optimal control with most available turf fungicides.

Most curative fungicides also have some preventative activity, so uninfected leaves treated at the same time will also be kept clean.

Eradicant

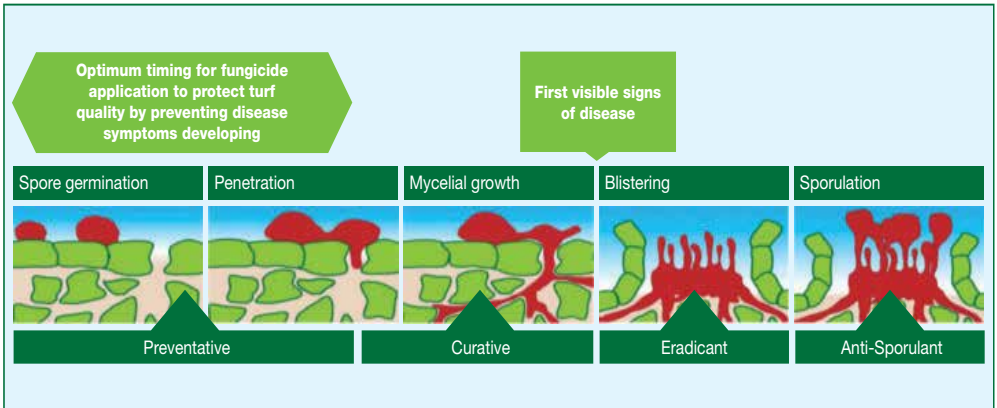
Eradicant fungicide activity prevents the pathogen sporulating and can help minimise further disease development and spread. However, at this stage of infection there will be dead leaf tissue resulting in scarring, along with further die-back of damaged leaf tissue, which will not be alleviated by fungicide treatment.

Fungicide treatment at the eradicant stage will not prevent disease damage, but may enable turf to recover faster, through new leaf growth being protected from disease attack.

Facing the challenge of turf Disease Control

Fungicide activity

Fungicides work at different stages in the disease pathogen life cycle. Understanding how each individual product works is essential to get the application timing right and achieve the best results.



	Preventive	Curative	Eradicant
Zone of activity	Stops spore germination on the leaf surface to prevent infection	Stops early pathogen development inside the plant	Stops pathogen development when disease symptoms are visible, to prevent further spread
Application timing	Best applied just ahead of periods of high disease risk and before disease infection	Apply at periods of high disease risk, when infection could have occurred, but before symptoms are visible	Apply when the first signs of infection are identified



Top tips on fungicide choice

- Choose fungicides with activity appropriate to the stage of infection and turf growth
- Always follow label guidelines to achieve the best results
- Check turf safety of fungicide formulations



	Propiconazole	Chlorothalonil	Azoxystrobin
Activity	Preventative Curative Eradicant	Preventative	Preventative Early-curative
Physical mode of action	Xylem systemic	Contact	Xylem systemic
Biochemical mode of action	Disrupts ergosterol production, preventing growth of the pathogen	Affects fungal cell function	Prevents electron transfer in mitochondria to stop energy production and fungal growth
Diseases on Label	Dollar Spot Anthracnose Brown Patch Powdery Mildew Rust Leaf Spot	Dollar Spot Fading Out (<i>Helminthosporium sp.</i>) Brown Patch	Anthracnose Brown Patch Fusarium / Microdochium Patch Leaf Spot (<i>Bipolaris</i> spot) (<i>Bipolaris sp.</i>) Grey Leaf Spot Rusts Melting Out (<i>Drechslera sp.</i>) Necrotic Ring Spot Pythium Blight Red Thread Summer Patch Take-All Fairy Ring
Approved for use on	<ul style="list-style-type: none"> • All areas of the golf course • Soccer and rugby pitches • Bowls greens • Cricket pitches • Tennis courts • Athletic tracks 	<ul style="list-style-type: none"> • All areas of the golf course • Soccer and rugby pitches • Bowls greens • Tennis courts • Amenity turf • Athletic tracks 	<ul style="list-style-type: none"> • All areas of the golf course • Soccer and rugby pitches • Bowls greens • Cricket pitches • Tennis courts • Parks and lawns • Athletic tracks
Dose Rate	2–4 l/ha	3.5–5.2 l/ha	560–1120 g/ha

BANNER GETS TO WORK FASTER



Banner Fungicide controls numerous diseases on ornamentals and other landscape and nursery plantings. It is a high performance specialist turf fungicide.



≡ **FAST** uptake
into the leaf



≡ **FAST** disease
control



≡ **FAST**
movement
through the plant



≡ **LONG**
lasting results

 **Banner**[®]
Fungicide

syngenta.



Key Features:

- Delivers fast uptake and systematic movement – gets to work quickly and protects turf as it grows
- Gives excellent control of Anthracnose; Brown Patch; Dollar Spot; Leaf, Stem and Stripe Rust; Leaf Spot (Melting Out); Powdery Mildew; and Spring Dead Spot.
- Has preventative, curative and eradicant activity.
- Is physically compatible with a range of products, including Heritage Maxx and Daconil Weatherstik
- Is approved for application through boom and knapsack sprayers.

Banner is an excellent turf fungicide offering fast, highly effective control of broad spectrum of turf diseases.

Fast broad-spectrum disease control

Banner is quickly taken up by turf plants, providing fast protection from disease attack and avoiding disruption in mowing schedules. With 1 hour rainfastness, Banner is safe from the effects of wash off by rain and irrigation within an hour of application. The active ingredient in Banner – propiconazole – provides turf managers with an alternative mode of action for disease control to improve turf quality. Xylem systemic translocation (upward movement) within the plant quickly moves control activity to the site of any infection. Movement up into new leaf growth ensures leaves are protected from new fungal attack.

Best results are achieved from Banner application when the disease is active, but still in the early stage of development, before visible damage to the turf occurs.

Where can Banner be used?

Banner is approved for disease control on all managed amenity turf surfaces.

Banner acts in three ways to minimize the effects of turf diseases:

- **Preventative**
Prevents visible disease damage occurring
- **Curative**
Control disease after infection but before symptoms are expressed
- **Eradicant**
Limits disease spread and aids recovery of new leaf

Brilliant solution for Large Patch control!

**Large patch develops on warm-season grasses.
Fairways - treat in May & early spring!**



Headway[®]Maxx
Turf fungicide

Causal Agent:

Rhizoctonia solani

Susceptible Turfgrass:

Kikuyu; seashore paspalum; zoysia grass and occasionally Bermuda grass

Symptoms:

Large Patch appears as rings or patches of blighted turfgrass that measure 12 cm to 3 m or more in diameter. Patches are brown to yellow in appearance, with a possible “orange firing” at the periphery of the patches. Small reddish-brown colored leaf spots occur on leaf sheaths, stems, and stolons. After the leaves die in the blighted area, new leaves can emerge from the surviving crowns. If the turfgrass is still green, the disease is most apparent down in the canopy, especially around the leaf sheaths as discolored/blackened lesions—when pulled lightly, these leaves detach very easily and are sometimes green above the damaged sheath.

Conditions Favoring Disease:

The symptoms of Large Patch can vary depending on the turfgrass cultivar, or climatic and atmospheric conditions, soil type, texture, and intensity of the turfgrass management. Conditions that favor this disease include: extended wet periods; high nitrogen levels; heavy soils; and dense thatch. This disease is favored by high relative humidity, as well as temperatures of 10°C to 15°C at night in late autumn or early spring. Infection is most likely when soil temperatures at a 5 – 10 cm depth decrease to 18°C. This is the period to apply preventive fungicides.

Management Tips:

- Maintain balanced fertility.
- Avoid nitrogen applications in the late fall through early spring when the pathogen is active.
- Increase the air circulation.
- Avoid over watering.
- Improve soil drainage.
- Reduce thatch.
- Treat in March and early spring.
- 2 litres/ha Headway Maxx for fairways. Do a follow-up application 21 days later.
- Water volume 750 – 1000lt /ha water.



Disease protection that sticks and stays

Daconil WeatherStik[®] gives complete protection from major turf diseases, even in the most difficult weather conditions.

The formulation of Daconil WeatherStik[®] ensures strong bonding of the powerful fungicide to the leaf surface - ensuring it will not be washed off by the rain and giving longer lasting protection from disease infection - and it is rainfast within an hour.

Used on its own or combined in a programme with other Syngenta fungicides, like Heritage[®] and Banner[®], as part of an integrated turf management plan, Daconil WeatherStik[®] delivers excellent disease control whatever the weather.



Daconil Weatherstik[®]
Fungicide

syngenta.

Daconil Weatherstik



Daconil Weatherstik® VS Generics

Fungicide

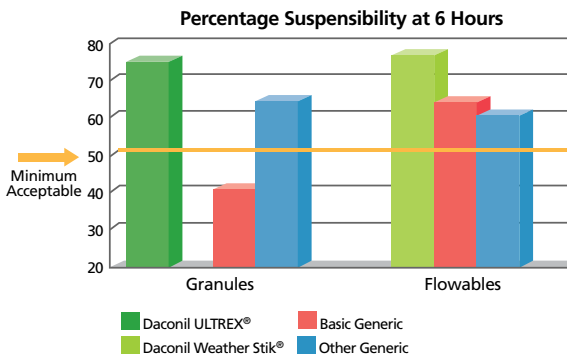
Key Features:

- Stays in suspension after 6 hours - better mixability
- Smallest particle size for maximum benefit
- Easier handling
- Greater efficiency, longer shelf life, less sediment
- Reduced foaming
- Daconil has a neutral pH for optimal performance
- Superior adhering power for extended coverage on the crown and sheath of grass blades
- Best overall disease control
- Provides residual control for 14-21 days.

Years of research and investments in formulation advancements have resulted in a remarkably high standard of disease protection. Daconil® has proven itself the premium contact fungicide.

Better Mixability

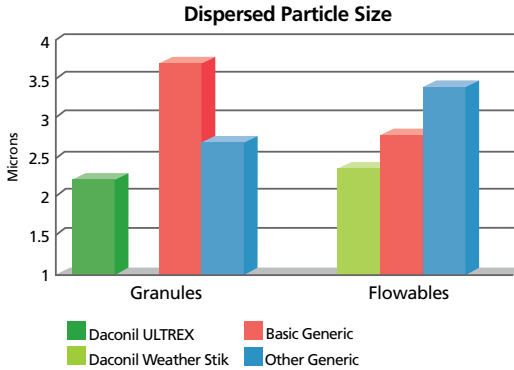
Daconil mixes and stays in suspension for at least 6 hours. And as the chart shows, it delivers at least 65% suspensibility, 6 hours after mixing.



Daconil Weatherstik

Smallest Particle Size for Maximum

Efficacy Smaller particle size offers lots of benefits. Such as greater efficacy. Longer shelf life. Less sediment. Most importantly, smaller particle size means greater surface area coverage. Daconil, with its relatively small dispersed particle size of 2.5 microns or smaller, offers a decisive size advantage.



Quicker Foam Dissipation

After being tank mixed, many products will foam for as long as an hour—or more. That can slow you down. Daconil, on the other hand, keeps you on schedule, with complete foam dissipation within 15 minutes of mixing.

Foaming

15 Minutes

Daconil ULTREX



Other Generic DF



45 Minutes

Daconil ULTREX



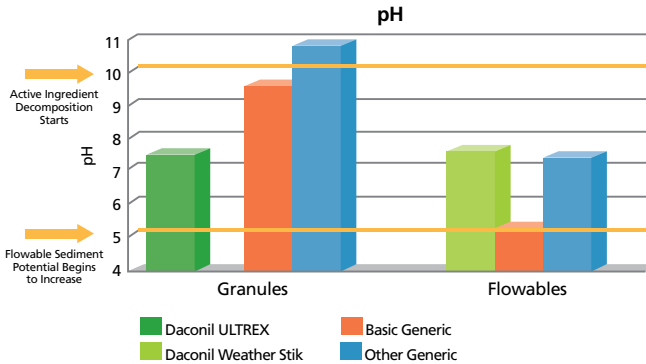
Other Generic DF



Daconil Weatherstik

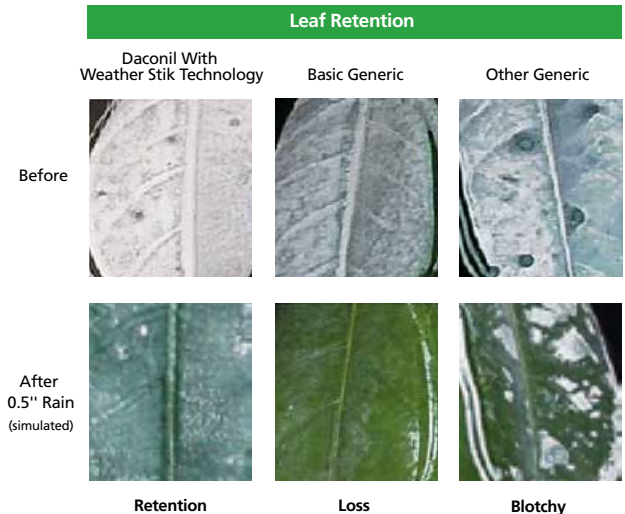
Ideal pH

High pH is more likely to cause corrosion and create compatibility problems with pH-sensitive products and adjuvants. It can also promote decomposition of the active ingredient. At the other end of the scale, low pH tends to lead to the fallout of sediments. With a near-neutral pH of 7, Daconil avoids those problems with a leading-edge formulation that has been refined over the years for optimal performance.




More Sticking Power, with Weatherstik Technology

Daconil delivers extended protection, even after heavy rains or irrigation. Daconil Weatherstik has a built-in surfactant, adjuvant, and compatibility system called Super Weatherstik®. It provides superior adhering power for extended coverage on the crown and sheath of grass blades. That's “stick and stay” disease protection.



Take turf disease control to the next level

- Complete uptake by **leaf and root**
- Long lasting protection for **28 days**
- Controls **foliar and soil** diseases
- Magnificent **THIRTEEN** turf diseases on the label
- **Five**-way turf disease protection
- Exceptional easy-to-use water soluble granule formulation



Turf disease protection that stays cut, after cut, after cut...

 **HeritageMaxx**[®]
Turf fungicide

syngenta.

Heritage Maxx



Key Features:

- Complete uptake by leaf and root
- Has natural origins
- Systematic strobilurin fungicide - protects the turf as it grows
- Long lasting protection for 28 days
- No-compromise control of foliar and soil diseases
- Targets infection before it occurs and prevents spreading

Heritage Maxx now offers turf managers the broadest spectrum disease control of all turf fungicides. An incredibly powerful fungicide, yet still extremely gentle on turf. The low environmental impact makes Heritage Maxx a perfect fit for the effective integrated pest management plans.

Heritage Maxx provides powerful protection; targeting infection at the very early stages of the pathogen's life cycle and eliminating disease before it has chance to cause damaging effects on the turf.

Heritage Maxx is a protectant (preventative) fungicide with early curative and eradicant activity. Heritage Maxx also stops disease sporulating and preventing further spread of infection (Fig 1).

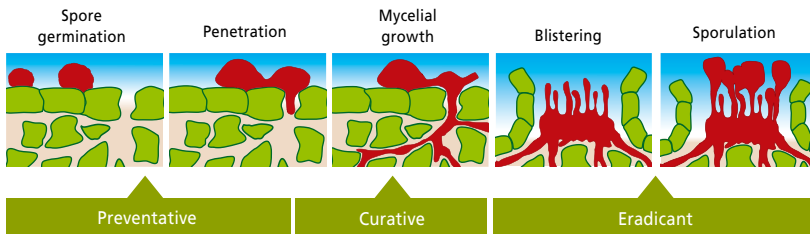


Fig 1. Heritage Maxx combines powerful protectant properties with effective early curative and anti-sporulant eradicant activity.

Heritage Maxx

Heritage Maxx is the only systemic strobilurin fungicide - which effectively protects turf as it grows. Heritage Maxx is rapidly taken up by actively growing plants and moves upward through the xylem system, combating disease infection from within the plant.

Systematic Movement

The true systematic movement works in all conditions and does not rely on rain or air redistribution to reach new parts (Fig 2).

The active ingredient rapidly moves within the plant, continuously spreading into vulnerable new growth and targeting any new disease attack - providing long-lasting protection as the plant grows.

Heritage Maxx should be the first option fungicide during periods of active turf growth, through spring, summer and autumn. Active turf growth most appropriate for Heritage Maxx application typically occurs whilst air and soil temperatures are consistently above 8° C - 10°C. The systemic movement, safe within the plant, ensures disease protection will not be mown off with the first cut after application.

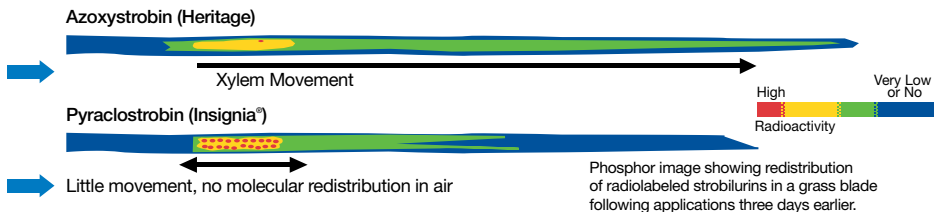


Fig 2. Heritage Maxx – the only systemic strobilurin which protects the plant as it grows

Total root-to-leaf distribution

Azoxystrobin, the active ingredient (AI) in Heritage Maxx, is taken into turf blades quickly for protection upon application. However, a significant portion of Heritage Maxx remains on the leaf surface. Upon irrigation, rainfall, or even a heavy dew, this remaining AI is washed down the surface of the turf. Some is then absorbed into the leaf, but the majority of Heritage Maxx moves into and through thatch to the soil. Here it is further absorbed by the roots to control soil-borne diseases and continues up through the entire turfgrass plant for additional foliar protection.

Redistribution of strobilurin fungicides over three days: A comparison



Intense red dot indicates high concentration of active ingredient and very little movement from the point of application. Green areas demonstrate advantageous distribution throughout the leaf.

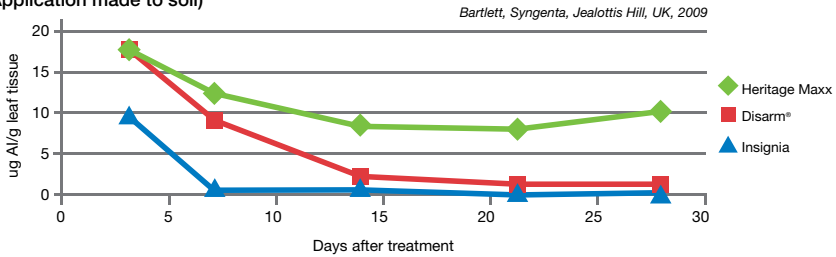
Added protection at mowing

With exudation through the stomates and after each mowing, Heritage Maxx:

- Protects following mowing injury
- Can be secondarily recycled via irrigation back into the soil and roots
- Moves up into new growth

Heritage Maxx VS Generic Strobilurins

Levels of AI recovered from leaf (Application made to soil)

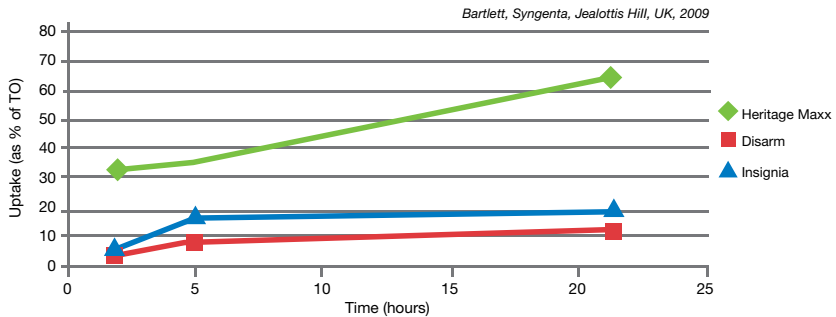


No-compromise control

Some strobilurins have little to no root uptake at all. Others may require more watering-in order or higher water volumes to be transported to the roots, which can sacrifice foliar control of diseases like Brown Patch, Yellow Patch, Anthracnose, and Leaf Spot.

Leaf uptake over 24 hours

(Application made to foliage; no irrigation)



Preventive anti-sporulant activity

Heritage Maxx delivers control at every stage of a pathogen's life cycle. This highly potent spore germination inhibitor prevents many fungal diseases before they occur and is also active after infection. To prevent infections, applications should be made well before visible disease symptoms occur.

Protect your turf from Waitea patch

Waitea patch is a disease that can take hold of your turf during spring, early summer as daytime temperatures increase. However, with the right timing and the right product, you can get rid of Waitea patch and keep your turf healthy all season long.



SYMPTOMS

Waitea patch is an emerging problem on Poa Annua. Infection typically begins as thin yellow rings, ranging from several inches to a foot in diameter (10 cm to 0.3 m). Rings may be circular or irregular in shape, and may become brown over time.

Patches often have a greenish colour behind the yellow ring which tends to be soft and sunken. Symptoms are very similar to those of Yellow patch, and can also be confused with fairy ring and summer patch. Unlike yellow patch however, Waitea patch tends to occur over a broader range of temperatures, and persists into the warmer weather of the summer.

DISEASE CONDITIONS

The disease can first appear in the cooler weather of the spring and persist into the warm temperatures of the summer. Infection has been shown to occur between 10° - 35° C with optimal temperatures of 25° to 30° C. The pathogen is thought to infect the upper roots, crown, stem and leaves of individual plants. It also appears to degrade thatch, which can cause sunken rings on putting greens.

Treat with Heritage Maxx and Banner. It will take more than one application to get control of this disease.



syngenta®



Pre-emergent weed control

Saving you time and money

PENNANT MAGNUM Turf Herbicide delivers effective control of various broadleaf weeds and grasses through an optimised formulation (S-metolachlor). PENNANT MAGNUM has limited residual and does not affect new root development in turf production after harvesting or in sports field or golf course fairway recovery after the winter season.

Key features:

- Optimised S-metolachlor formulation with 35% more herbicidal activity
- Pre-emergent control of various annual grasses – Goosegrass, Nutsedge, Crabgrass, Poa Annua (Winter Grass) – and broadleaf weeds
- Safe to use on recovering turf
- Minimal effect on new root development when growing back Bermudagrass (Cynodon spp) or Kikuyu after harvesting and during recovery of sports fields after the winter season
- Perfect rotation partner for K1 turf herbicide group

APPLICATION

- ✓ **Apply Pennant Magnum when soil temp reaches 16° Celsius and do a follow up application 4-6 weeks later to prevent annual grasses like Goosegrass and Crabgrass.**
- ✓ **Apply to Kikuyu, Bermuda (Cynodon/Kweek) and Paspalum in March to prevent Poa Annua germinating.**

TALKING TURF

Foliar FEED



**PRODUCING THE ULTIMATE PLAYING SURFACE
ON FAIRWAYS, SPORTS FIELDS OR LAWNS.**

**APPLY MONTHLY TO ANY GREEN GRASS
TO INCREASE PLANT HEALTH & COLOUR!**

Fertilizer Group 1

Reg no: K9545 Act 36 of 1947

N = 309,22 g.kg⁻¹ P = 1,50 g.kg⁻¹ K = 3,29 g.kg⁻¹
S = 52,61 g.kg⁻¹ Mg = 2,01 g.kg⁻¹ Fe = 61,99 g.kg⁻¹
Mn = 18,44 g.kg⁻¹ Mo = 0,1 g.kg⁻¹

STORE IN A COOL DRY PLACE

APPLICATION GUIDELINES:

- Apply 3-12,5 kg/ha in 300-600 litres water per ha.
- Do not water in.
- Apply the day after mowing for best results.
- Can be tank mixed with Primo Maxx.
- Sit back & enjoy this easy maintenance programme!

TRIED & TESTED ON WARM & COOL SEASON GRASSES SINCE 1999

**SALES AND DISTRIBUTION:
MARKETING & TECHNICAL
SUPPORT:**

**Lejeune Saunders
Willem Kok
Sue de Zwart**

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082 462 9866

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sue@talkingturf.co.za

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**BREAKTHROUGH
BIO-DEGRADABLE
EFFECTIVE WATER
TREATMENT
TECHNOLOGY
NOW IN SA!**

HydroCide

Water Treatment



**A breakthrough in the treatment of
*Algae, Ecoli, Spores, Fungi and Bacteria.***



Algae, Ecoli, Bilharzia larvae control in dams, streams & reservoirs:

Surface spray 25 % of the dam at a time.
Spray at a dilution of 50:50 HydroCide to water, for example:
5 litres HydroCide & 5 litres water when algae present.



Improved fish health in dams & streams:

Surface spray dams at a dilution of 1:400 HydroCide to water:
‡ 12,5 ml HydroCide in 5 litres water
- 50 ml HydroCide in 20 litres water



Irrigation pipe line maintenance, Hydroponics, dams & streams:

Inject into the system at a dilution of 1:60 000 litres i.e. 1,65 litres/ha
per 100 000 litres or 16,5 litres per 1 million litres water.



Reservoir:

‡ metres x 1,5 metres deep = 28 274 litres water – add 470 ml HydroCide
‡ when algae is present or on a monthly basis.



Swimming pool:

- **School pool:** 25 metres x 10 metres x 1,5 metres deep = 375 000 litres –
5 litres per application – apply per month in the skimmer box of the pool.
- **Home pool:** 8 metres x 4 metres x 1 - 1,5 metres deep = 32 000 litres –
apply 500 ml per month in the skimmer box of the pool.

EUROPEAN TESTED & NRCS REGISTERED!

HydroCide is a breakthrough in the treatment of algae, spores, fungi and bacteria. The product provides a unique solution in the treatment of biologically contaminated water in ecological sensitive areas. It is registered with the NRCS as detergented disinfectant solutions of less than 0.5% have the following advantages:

- Effectively controls algae, spores, fungi and bacteria
- PH Neutral
- Non-irritant
- Non-corrosive
- Bio-degradable
- Good Wetting Effect.

Shock Treatment:

Pre-dilute 20L of HydroCide 1:10 with water and pour solution slowly into a flowing stream. Ensure there are no fish within 30m of where the water is dosed. The treatment should be made on a weekly basis for 2 weeks, every 2nd week for 2 treatments & then monthly until the water is clear. Once the water looks good – change to the maintenance treatment. Please contact us prior to doing any shock treatment in an area with a high fish population – although HydroCide is beneficial to the health of the fish the treatment is important.

Maintenance Treatment:

Apply HydroCide at 1:400 dilution with water. Spray it onto the water surface using a knapsack sprayer. Do not apply in windy conditions where drift could damage turf. If there is a blanket of algae when this treatment is being made do not treat more than 50% of the surface area per week.

Product Description:

HydroCide Water Treatment is available in 5 litre and 20 litre packs.

EUROPEAN TESTED:

EN1276 Anti Bacterial

EN1650 Anti-Fungal

NRCS REGISTERED.

Safety:

Eyes: Wear goggles when diluting concentrate. Avoid eye contact. In case of contact, flush with water for 5 minutes. Seek medical attention.

Skin: Wear gloves when handling the 20% concentrate. Wash with water. Concentrate may stain skin brown for 3-4 days.

Ingestion: DO NOT INDUCE VOMITING! Give plenty of water to drink.

Inhalation: Remove to fresh air.

NOTE: DO NOT MIX WITH ANY OTHER CHEMICALS, unless indicated by the Manufacturer. Do not mix with ammonia, and straight twin chain QAC compounds. There are no heavy metals or Benzene structures in HydroCide. DO NOT STORE IN DIRECT SUNLIGHT and store away from children and uninformed people.

Refer to HydroCide MSDS for further information.

Product Specification:

% Stabilised Biocide: 20 – 21.00%

pH Range: 5.00 – 7.50

Appearance: CLEAR/YELLOWISH LIQUID

Solubility: 100% IN WATER

In-compatibility: Certain Amides, Benzene, cyclic structures and single straight chain quaternary ammonium compounds (QAC).

Compatible: Non-ionic, anionic, cationic and amphoteric surfactants and detergents. Alcohols, glycols and many more other non nitrogen containing compounds.

Eco Toxicity: All the ingredients of HydroCide are biodegradable.

Toxicity:

Solutions of less than 0.5% active non skin irritant.

Solutions of less than 0.3% active not orally toxic.

Solutions of less than 0.2% active non volatile.



For further information contact sales@talkingturf.co.za

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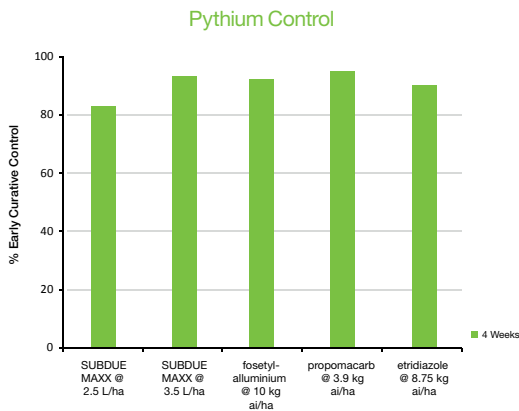
The Pythium Specialist



SUBDUE MAXX is one of the best preventative and early curative systemic fungicides for effective control of Pythium in your greens.

What SUBDUE MAXX offers you:

- A highly effective, economical solution for Pythium in all turf species
- Protection of germinating seedlings during overseeding with high turf safety
- The combination of fast absorption and even systemic movement as well as contact action in soil, resulting in full plant protection
- MAXX technology allows for excellent tank mix compatibility with other fungicides and foliar fertilisers
- Low odour, non-staining formulation



Fast stopping power combined with long lasting control

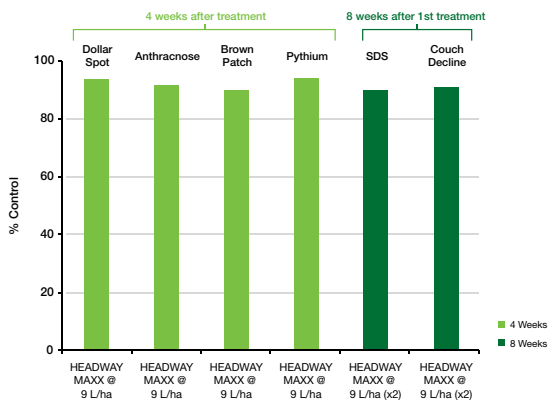
 **Headway[®]Maxx**
Turf fungicide

 syngenta[®]

HEADWAY MAXX Turf Fungicide combines two actives – one providing strength and longevity and the other speed and early curative action. Once absorbed by the leaf, it moves up through the plant and is redistributed to protect new leaf growth. In addition, it's also absorbed through the roots making it effective against root diseases like Pythium, Take-all Patch and Couchgrass Decline.

What HEADWAY MAXX offers you:

- Control and prevention of a broad spectrum of turf diseases including Dollar Spot, Pythium, Anthracnose, Brown Patch and the ERI complex (Couchgrass Decline and Take-all Patch)
- The option to tank mix with DAPONIL WEATHER STIK or MEDALLION Turf Fungicide to get the combination of systemic and contact action for high risk periods
- MAXX technology that ensures excellent tank mix compatibility with other fungicides, foliar fertilisers and PRIMO MAXX
- A low odour, non-staining formulation



Instrata

Triple
modes
of action



syngenta.

INSTRATA Turf Fungicide combines three active ingredients in one powerful package. The first provides rapid systemic action for quick control of fungi already within internal tissues, the second moves in a translaminar manner to treat any fungi actively moving through the epidermis, the third is the industry benchmark contact that creates a robust protective layer on the leaf surface. With this product all the options are covered.

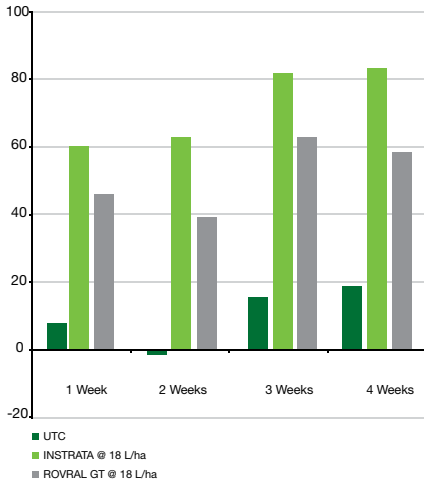
- The combination of three active ingredients - Chlorothalonil, Propiconazole and Fludioxonil - with their multiple modes of action, enables Instrata to control numerous diseases.
- Uses multiple modes of action to help guard against disease resistance
- Systemic and contact activity helps control a broad-spectrum of other turf diseases, including anthracnose, dollar spot, brown patch and summer patch
- Three separate active ingredients help promote efficiency and resistance management
- Can outperform many conventional products as well as two- and three-way tank mixes



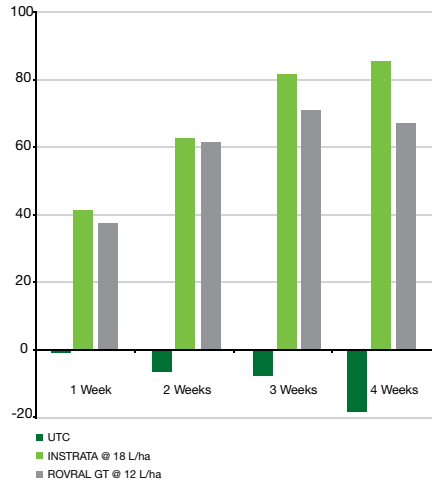
Key Features:

- A crown and foliar disease specialist controlling Anthracnose, Brown Patch, Dollar Spot, Helminthosporium disease and Winter Fusarium
- Triple modes of action – one systemic triazole in combination with two contact fungicides each with different modes of action
- Rapid systemic movement combined with contact action that stops spore germination fast and prevents the spread of disease
- Superb resistance management tool that has a fit at any time, in any season
- Trusted Weather Stik Technology is a core component of the formulation
- Up to 28 days coverage from a single application

Curative Control of Anthracnose



Curative Control of Dollar Spot



INSTRATA is an excellent choice for use in a preventative program or curatively after first symptoms are evident. The quick systemic action of the propiconazole component will deliver a rapid clean out of internal transport tissues which is especially important in curative situations. The chlorothalonil and fludioxylin components together attack germinating spores and developing fungal mycelium to rapidly clean and protect external surfaces. INSTRATA should be applied at 9 L/ha and will deliver a solid 28 days of coverage.

Save Time and Money from Tee to Green

In cash strapped times regulating turf growth with Primo Maxx gives you the chance to manage your turf and your time more effectively.

Improve your turf quality with Primo Maxx programmes, tailored from tee to green. Proven to promote healthier plants to keep your turf looking great and playing well. Cut your costs and not your quality with Primo Maxx.



 **Primo Maxx**[®]

syngenta.

Primo Maxx



Key Features:

- Reduced time and money spent on mowing
- Reduced carbon emissions
- Increase cutting height
- Reduces Poa seed heads
- Improves uptake of water and nutrients
- Improved root structure produces exceptional turf quality and health
- Enhancing the playing experience



PRIMO MAXX® FOR GREENS

- ✓ Higher quality playing surface as improved density
- ✓ Better wear tolerance
- ✓ Faster cutting and less clippings to box off
- ✓ Improved sward condition in the shade
- ✓ Improved rooting = improved stress tolerance
- ✓ More consistent greens speed throughout the day



PRIMO MAXX® FOR FAIRWAYS

- ✓ Plant health – improved rooting, tillering thus a healthier plant
- ✓ Deeper roots – quicker recovery from heat stress & improved water usage
- ✓ Improved wear tolerance and less divots as improved turf density & rooting
- ✓ Improved striping which lasts longer
- ✓ Quicker recovery from stress
- ✓ Reduced carbon footprint

Primo Maxx

Primo Maxx increases the density of turf, creating a better playing surface. Reducing the hours spent mowing, releases time and money for more productive management around the course.

Fairways looking good

Primo Maxx increases the density of fairway turf, creating a better playing surface on which balls sit higher and cleaner. The result is a more rewarding experience for players, reduced risk of divot damage and faster play.



Cut costs and carbon emissions

Calculations by international researchers at Cranfield University in the UK have shown Primo Maxx programs can effectively halve the carbon footprint on a typical 18-hole golf course, potentially reducing emissions from 3570 kg per year to 1862 kg. At the same time, the cost of maintenance would be cut from an average R200,000 to R150,000 – a saving of around 25% per year.

Turf managers always report that Primo Maxx gives greater flexibility to manage the mowing during difficult weather conditions and causes the least inconvenience to players.



Increase cutting height

In practice, managers of fine turf surfaces, have found the denser sward of Primo Maxx treated turf enables cutting height to be raised by 1 mm to 2 mm, whilst retaining equally fast and more consistent ball roll. Raising the cutting height significantly reduces the stress on plants and can help to contribute to a healthier sward.

Q&A with Sue de Zwart



Why does Primo Maxx work well in the rainy season?

Primo Maxx reduces the clippings to 50 % after the first application. This makes turf far more manageable during wet periods.

What is the optimum application timing?

I have found this to be 28 days on all areas other than greens. It works well to lightly verticut a few days before applying the product.

How does Primo work?

It works as a reservoir effect in the plant. Bear this in mind when you are verticutting & mowing. There is no point in verticutting after your Primo application as you will lose the bulk of the product.

Why use Primo Maxx?

I would suggest you run a trial & you will answer this question yourself. The far superior turf quality is evident after the 3rd application.

You will see a clear line between the treated & untreated area. The turf is denser and greener. The mowing of fairways is reduced from 7 days a week to 4 days a week.

How do I determine an application rate?

A good starting point for greens is 200 ml/ha/week. You can spray 400 ml/ha Every 14 days is this is easier.

Fairways start at 1 litre/ha/28 days. In the Southern Cape we have found 1,5 litres/ha every 28 days to be ideal.

In Mpumalanga 2 litres/ha/28 days is ideal. The lower the rate the less the impact on the overall turf quality.

Semi Rough - start at 500 ml/ha/28 days and you can work this up. Remember your uptake is far greater in higher turf.

Rye grass at 24 mm - we have found 750 ml/ha to be a good rate on this.

Why are you so passionate about Primo Maxx?

I have worked with Primo since my time at Pebble Beach in 1996 and I have really grown to understand & love the product.

It would be the last product I would cut out my budget after seeing the unbelievable turf quality this product allows to produce.

Photo's with questions can be emailed to sue@talkingturf.co.za

She will gladly answer any questions you might have.

Primo Maxx Programme

Making your job stress free with less effort, reduced clippings and decreased costs. Producing superb turf quality.

GREENS – “Speed in jug!”

All rates are per hectare

AREA:	TURF	RATE	FREQUENCY
Greens	BENT & POA	150-200ml	Every 7-10 days
	BERMUDA & PASPALUM	400ml	Every 10-14 days
	ULTRA DWARF BERMUDA	140-220ml	Every 10-14 days

FAIRWAYS/ INTERMEDIATE: 8-25 mm

Warm Season Turf			
AREA:	TURF	RATE	FREQUENCY
Fairways, Tees, Intermediate	Bermuda, Kikuyu & Paspalum	1 Litre – 1,5Litres	Sept, October
		1,5Litres – 2Litres	Nov, Dec, Jan, Feb
		1 Litre – 1,5Litres	March, April
Spray every 28 days.			

Cool Season Turf			
AREA:	TURF	RATE	FREQUENCY
Fairways, Tees, Intermediate		500ml – 1Litre	Every 14 days

SEMI ROUGH 25-40 mm

Warm Season Turf			
AREA:	TURF	RATE	FREQUENCY
Semi Rough	Bermuda, Kikuyu & Paspalum	500ml – 750ml	Sept, October
		750ml – 1Litre	Nov, Dec, Jan, Feb
		500ml – 750ml	March, April
Spray every 28 days.			

Cool Season Turf			
AREA:	TURF	RATE	FREQUENCY
Semi Rough		500ml – 1Litre	Every 14 days

BUNKER FACES, STREAM BANKS & DAM EDGES

AREA:	TURF	RATE	FREQUENCY
Stream Banks & Dam Edges	Bermuda, Kikuyu & Paspalum	500ml – 750ml	Sept, October
		750ml – 1Litre	Nov, Dec, Jan, Feb
		500ml – 750ml	March, April
Spray every 14 days. Stream banks and dam edges. 50mm or higher rough – 500ml/ ha every 28 days			

Meridian



Key Features:

- True broad spectrum control of surface-feeding insects including white grubs and mole crickets
- Highly effective at low rates of application
- Can be applied preventatively or when small white grubs/ juvenile mole crickets are present
- Easy to use formulation

Meridian offers high levels of pest control. The active ingredient, thiamethoxam, is a powerful new-generation neonicotinoid, formulated to provide high water solubility for faster results. Meridian has been shown to be highly effective in controlling the damaging larval stage of juvenile mole crickets and white grubs.

How does it work?

Thiamethoxam works by disrupting nicotinic acetylcholine receptors in the insect's nervous system. Insects stop feeding within an hour of coming into contact with thiamethoxam, preventing further damage to turf. Death of the insect generally occurs within one or two days of ingesting the active ingredient.

Reducing insect pest populations in the soil can minimise risk of secondary damage from birds and other animals rooting for food sources.

The high bio-availability of Meridian ensures a high level of performance. The increased solubility of thiamethoxam increases immediate availability to plants. Longer-term, the intrinsic soil bonding of Meridian facilitates continuous desorption into solution for persistent pest control lasting up to 100 days.

Higher solubility, increased bio-availability and efficiency

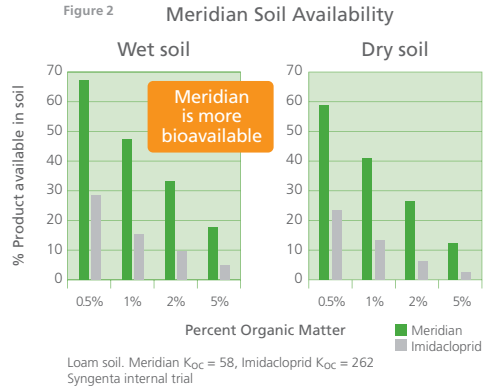
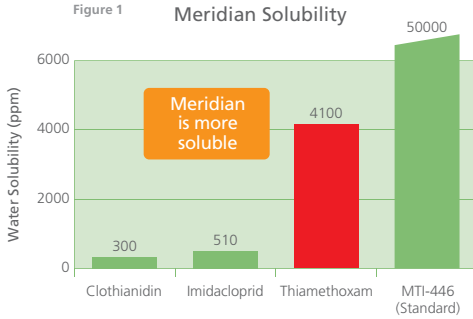


Figure 3 Performance in dry soil

	0-30 days	20-100 days
	Dissolved (majority of active)	Soil bound (majority of active)
Meridian	<p>Higher solubility</p> <p>Increased bio-availability and efficacy</p>	<p>Easier desorption</p> <p>Increased bio-availability and efficacy</p>
imidacloprid	<p>Lower solubility</p> <p>Decreased bio-availability and efficacy</p>	<p>Difficult desorption</p> <p>Decreased bio-availability and efficacy</p>

Season long grub control programme



Dr Rick Brandenburg
Professor of Entomology at
North Carolina State University



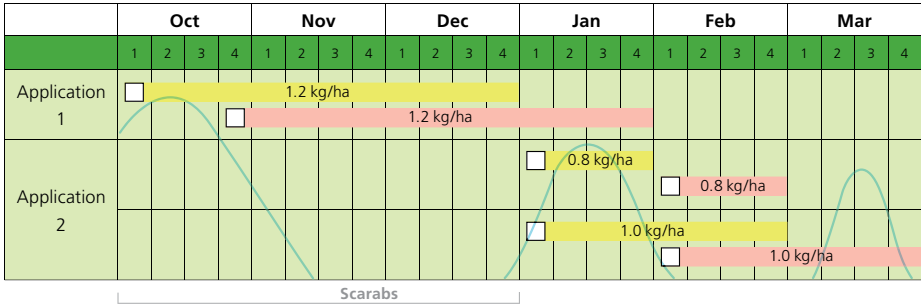
BLACK MAIZE BEETLE

Meridian has excellent efficacy on Black Maize Beetle (1st and 2nd instar only). The best timing for application is thus during or shortly after peak egg laying. The illustration above suggests the optimum time of application to ensure optimal results. Meridian has varied dose rates to accommodate the need for a follow up application when the second and/or third generations of Black Maize Beetle is to be controlled.

Meridian

Application

To target soil pests Meridian should be applied with sufficient water volume to achieve good penetration of thatch into the soil. Select nozzles designed to enhance turf penetration. Irrigate with at least 6mm of water as soon as possible after application.



- Approximate timing for Meridian application
- Approximate Meridian residual expected QLD, NSW, WA
- Approximate Meridian residual expected ACT, VIC, TAS, SA
- Peaks in egg laying activity

KEY INFORMATION

- Apply Meridian after the first rains (Oct, Nov) and follow up 60 days later (Jan, Feb)**
- When you see the adult beetles this is your final warning prior to them laying eggs**
- Meridian increases root depth and mass whilst controlling the insects**



	Meridian [®]
White Grubs	✓
Curative Grub Control	✓
Black Maize Beetle	✓
Mole Crickets	✓ - suppression
Ants	✓
Landscape Insects	
Aphids	✓
Whiteflies	✓
Mealybugs	✓
Leafhoppers	✓
Surface Water advisory	✓
Ground Water advisory	✓
Plant uptake	40% at 24h
Current Formulation(s)	0.33G, 25WG
Watering Requirements for preventive treatments	up to 7 DAT

✗ = not labeled. **DAT** = days after treatment. ✓ = labeled.
 ✓ - suppression = suppression claim only.

Syngenta XC Nozzles



Syngenta XC Nozzles are a breakthrough in turf application technology, to deliver better and more accurate results.

Syngenta Turf XC Nozzle range availability						
Size	Typical water volume (l/ha)	Typical spraying speed (Km/hr)	Recommended use	Best used with	Benefits	
	220-400	5-7	Foliar fungicides; herbicide and growth regulator.	Primo Maxx Heritage Banner Daconil Weatherstik	<ul style="list-style-type: none"> Maintains an even spray Combats spray drift allowing more spray Backwards spray angle enhances coverage even at low water volumes 	
	450-1000	5-7	Fungicides targeted at soil application and wetting agents.	Heritage Meridian		

The rearwards spray angle compensates for the forward movement of the sprayer, delivering better all-round coverage of the turf leaf.

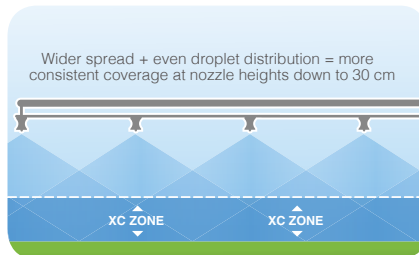
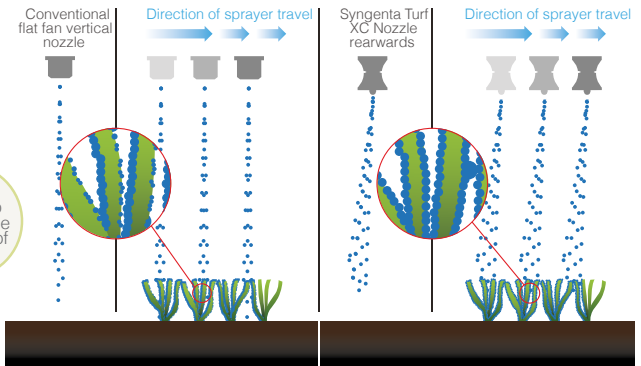


Ridge on nozzle tip should face direction of travel

Angled spray

Fit Syngenta Turf XC Nozzles so that the angled spray pattern faces rearwards. Insert nozzles into the bayonet with the Syngenta logo and moulded arrow on the nozzle to the front (facing direction of travel).

Syngenta Turf XC Nozzles fit ISO standard bayonet caps on most sprayers. Hardi sprayers will require bayonet adapters. These are available from the GreenCast website.



Even coverage
Syngenta Turf Nozzles have been specifically designed to cope with and maintain even coverage when spraying undulating ground.

Nozzles

Foliar nozzle application chart



Nozzle	Pressure (bar)	Flow rate per nozzle (l/min)	Application rate l/ha at respective forward speed (km/hr)					
			3	4	5	6	7	8
04	1	0.924	370	277	222	185	158	139
	1.5	1.131	453	339	272	226	194	170
	2	1.306	523	392	314	261	224	196
	2.5	1.461	584	438	351	292	250	219
	3	1.60	640	480	384	320	274	240
	3.5	1.728	691	518	415	346	296	259
	4	1.848	739	554	443	370	317	277

Other Syngenta Turf XC Nozzle sizes available: **025** - Foliar fungicide, herbicide and growth regulator applications at faster speeds. **08** - soil-acting fungicide and wetting agent applications.

■ Optimum range

Soil nozzle application chart

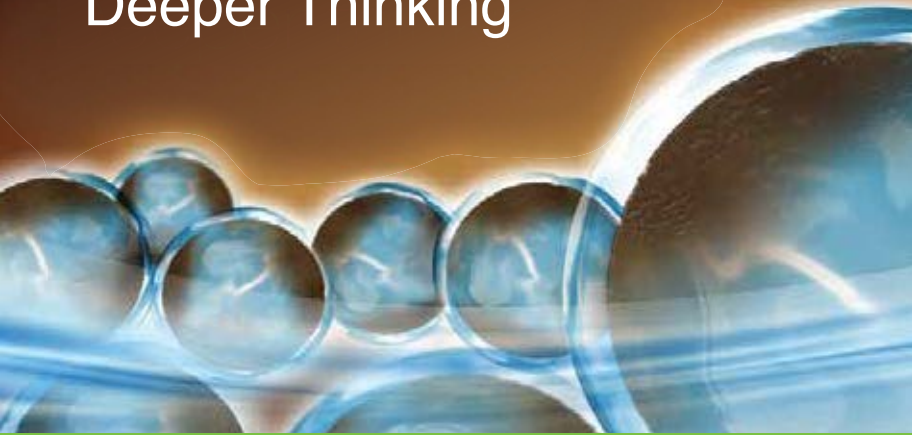


Nozzle	Pressure (bar)	Flow rate per nozzle (l/min)	Application rate l/ha at respective forward speed (km/hr)					
			3	4	5	6	7	8
08	1	1.848	739	554	443	370	317	277
	1.5	2.263	905	679	543	453	388	339
	2	2.163	1045	784	627	523	448	392
	2.5	2.921	1168	876	701	584	501	438
	3	3.20	1280	960	768	640	590	480
	3.5	3.456	1383	1037	830	691	638	518
	4	3.695	1478	1109	887	739	682	554

Other Syngenta Turf XC Nozzle sizes available: **04** - Foliar fungicide, herbicide and growth regulator applications at faster speeds. **025** - Foliar fungicide, herbicide and growth regulator applications at slower speeds.

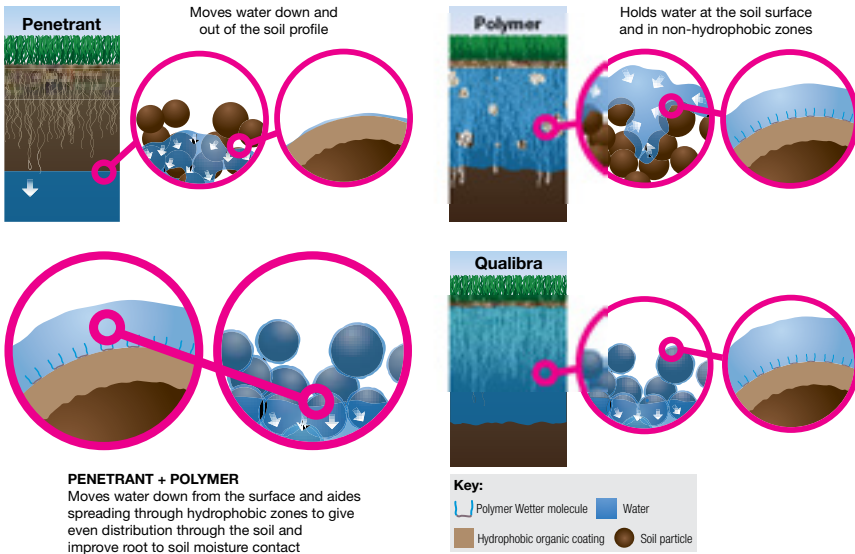
■ Optimum range

Deeper Thinking



Qualibra combines a unique and dynamic penetrant to move moisture, with a powerful polymer to hold moisture.

With Qualibra, water quickly moves away from the surface, and then is held more evenly and to greater depth within the rootzone for better utilisation by the turf plant.



Qualibra Wetting Agent



Qualibra is an exciting new development in wetting agent technology:

- Quick water movement away from the soil surface
- Better moisture retention deep and evenly in the root zone

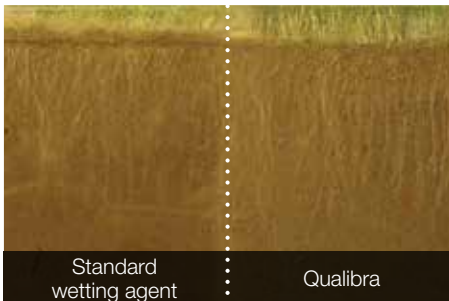
Qualibra can help to:

- Maintain plant health and playing surface quality
- Prevent damaging dry patch developing
- Make better use of irrigation resources
- Reduce effects of drought
- Retain healthy root mass

What makes Qualibra more effective?

Qualibra combines a unique and dynamic penetrant to move moisture, with a powerful polymer to hold moisture. Most current wetting agents are either just a penetrant type – with small molecules designed to move water away from the surface quickly, but not hold it – or large molecule block co-polymers, which hold water effectively but are not so effective at moving and distributing it through the root zone.

Qualibra has been designed with the ability to quickly move water away from the surface – to retain firm playing surfaces – then hold moisture deeper and more evenly in the root zone to prevent dry patch forming and invigorate root and plant health.



Qualibra rooting for quality

Qualibra has been shown to encourage greater root mass, deeper roots and better root retention. Healthier root retention helps turf:

- Make better use of water resources – rain and irrigation
- Utilise available nutrients more effectively
- Recover faster from periods of stress
- Stronger plants maintain better playing surface quality throughout the season

RYDER - Making light work

- Great lasting colour – that can be tailored to your turf demands.
- Protection from harmful UV radiation and high light intensities.
- Rainfast in 1 hour.

WITH RYDER, BEAUTY IS MORE THAN SKIN DEEP

RYDER is the new turf pigment technology that protects turf from harmful UV rays, excessive light and provides natural looking green colour.

Light stress

Turf is highly vulnerable to light stress and hence photoinhibition. This is when light intensity is way beyond the plants ability to regulate its energy with its normal photosynthetic pathways. On a bright sunny day, light intensity can be 4x greater than the plant saturation point (the point where additional light ceases to increase the photosynthetic rate any further).

The susceptibility of turf to light stress is severely intensified when under stress. This can be heat stress, drought stress or cold stress.

Dye difference

RYDER is a high-concentration turf-specific pigment. Unlike existing water soluble turf dyes, RYDER is a formulated pigment that, once dry on the leaf, it is not washed off by rain or irrigation and is stable in light. It stays in place for longer that retains its colour and effects.

Application aid

The instant colour provided by RYDER can act as a spray pattern indicator in itself, especially at higher rates or on turf inherently paler at the time of application.



syngenta®

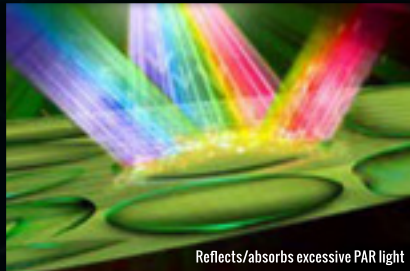
How does RYDER work?

RYDER absorbs and reflects not only damaging UV light but also will help protect against excessive light during the summer periods of overwinter cold stress.

RYDER helps protect against harmful UV light and excessive light



Reflects/absorbs UV-light



Reflects/absorbs excessive PAR light



Application advice

Use a water volume of 250-500 litres per hectare.

Greens and turf maintained at under 12mm

Apply at a rate of 0.75 to 1.5 l/ha

Turf maintained above 12mm

Apply at a rate of 1.0 to 2.0 l/ha

For superior coverage apply 0.5 - 1.0 l/ha in each of two directions.

Use higher rates for a deeper green colour, higher heights of cut and greater protection against light stress.

RYDER can be used at any time of the year but plan programmes when stressful periods are expected.

RYDER - Pigment applications on bermuda

Ryder pigment can be used many times during the year. At times, just to add some color after vertical mowing and topdressing. This will help keep your greens lean and not looking "lush"!

Ryder will work better when applied to green turf, just before going dormant. You can spray it on dormant turf, but the results will not be as good and a higher rate may be required.

Apply Ryder twice prior to dormancy - 3-4 weeks apart. First as they go dormant and second to help break the dormancy. The green color absorbs more heat and can speed up recovery by 2-3 weeks in sunny weather.

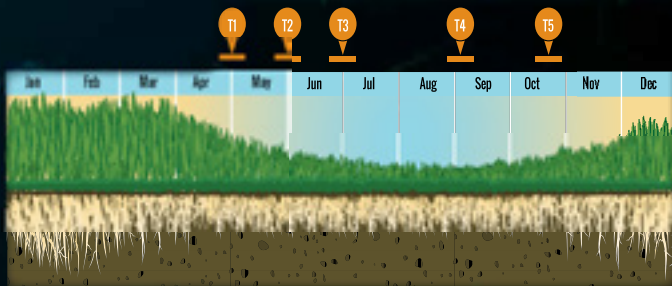
For areas that do not get as cold, spray Ryder every couple of weeks to keep the green during periods of light frost and cooler temperatures.

T1 and T2 at 2 litres/ha.

T3 at 1l/ha as you will have built colour.

T3 is after last mowing and spray in two directions (second spray at 90° to first spray) to improve coverage.

T4 and potentially T5 can increase spring recovery and break of dormancy. 1-2 litres/ha based on the colour you have.



Build the right plan.
Grow your best turf.

**ARGONOMIC
PROGRAMS**
FROM
THE **GROUND
UP**

syngenta.

Syngenta Turf Products Portfolio Summary

With Syngenta, you have optimized formulations, strong technical field support, continual product research, industry support, and cutting-edge programmes to help you produce the ultimate playing surface.

Pigment technology



- Great lasting colour – that can be tailored to your turf demands.
- Protection from harmful UV radiation and high light intensities.
- Rainfast in 1 hour.

Fungicides



- BANNER is the perfect choice for the control of *Anthraco*se, *Brown patch*, *Dollar spot*, *Grey leaf spot*, *Large patch*, *Leaf spot*, *Microdochium patch*, *Necrotic ring spot*, *Powdery mildew*, *Red thread*, *Rust*, *Spring dead spot*, *Summer patch*, *Take-all patch* and *Waitea patch*.
- An **early curative option** as a result of the combination of fast absorption into the leaf and fast and even systemic movement.
- Long lasting results.
- Low odour, non-staining formulation.



- DACONIL WEATHERSTIK is an excellent choice as the basis of **a preventative programme**.
- Broad spectrum control of major turf diseases including *Anthraco*se, *Brown Patch*, *Dollar spot*, *Grey leaf spot*, *Microdochium patch*, *red thread*, *rust* and *algae*.
- A fungicide that **sticks and stays under tough mowing and irrigation practices**.
- Compatible with all Syngenta fungicides to achieve systemic and contact action. Can also be tank mixed with Primo Maxx.
- High quality suspension concentrate formulation with low odour and non-staining properties.
- DACONIL WEATHERSTIK is rainfast 15 min after the spray deposit has dried.
- Provides residual control for 14-21 days.



- Greens and fairway fungicide with dual modes of action.
- Control and prevention of a broad spectrum of turf diseases including: *Anthraco*se, *Brown Patch*, *Dollar Spot*, *Fairy ring*, *Grey leaf spot*, *Large patch*, *Microdochium patch*, *Necrotic ring spot*, *Pythium*, *Red thread*, *Rust*, *Spring dead spot*, *Summer patch*, *Take-all patch* and *Waitea patch*.
- The option to tank mix with DACONIL WEATHERSTIK, BANNER or HERITAGE MAXX Turf Fungicide to get the combination of systemic and contact action for high risk periods.
- MAXX technology that ensures excellent tank mix compatibility with other fungicides, foliar fertilizers and PRIMO MAXX.
- A low odour, non-staining formulation.
- *Apply 2-3 L/ha for cost-effective fairway control.*



- Control and prevention of a broad spectrum of turf diseases including: *Anthraco*se, *Brown Patch*, *Fairy ring*, *Grey leaf spot*, *Large patch*, *Rhizoctonia leaf and sheath spot*, *Necrotic ring spot*, *Powdery mildew*, *Pythium*, *Red thread*, *Rust*, *Summer patch*, *Take-all patch* and *Waitea patch*.
- Consistent systemic protection of new growth for up to 28 days after application – the only strobilurin fungicide that protects the plant as it grows.
- The option to tank mix with DACONIL WEATHERSTIK to get contact action for high risk periods as well as dollar spot control.
- MAXX technology that ensures excellent tank mix compatibility with other fungicides, foliar fertilizers and PRIMO MAXX
- A low odour, non-staining formulation.

Fungicides continued

Instrata[®] Turf fungicide

- A crown and foliar disease specialist controlling *Anthracnose, Brown Patch, Dollar Spot, Grey leaf spot, Rhizoctonia leaf and sheath spot, Leaf spot, Microdochium patch, Red thread, Rust and Summer patch.*
- Triple modes of action- one systemic triazole in combination with two contact fungicides each with different modes of action.
- Rapid systemic movement combined with contact action that stops spore germination fast and prevents the spread of disease.
- **Up to 28 days coverage from a single application.**

Insecticide

Meridian[®] Insecticide

- A water-dispersible systemic granular insecticide with **stomach and contact action** for the broad spectrum control of *juvenile mole crickets and white grubs.*
- **Highly systemic movement** of the active ingredient means **faster control.**
- Meridian **increases root depth and mass** whilst controlling the insects.
- **Wide application window** for the flexible, preventative control.
- Meridian is able to move into the grub zone within **one day** of treatment. (The grub zones considered the top three inches of the soil profile).
- **White grubs that contact or ingest Meridian** are affected and mortality occurs quickly to prevent further turf damage.

Herbicide

Pennant Magnum[®] Herbicide

- Optimised S-metolachlor formulation with 35% more herbicidal activity.
- Pre-emergent control of various annual grasses – Goosegrass, Nutsedge, Crabgrass, Poa Annu – and broadleaf weeds.
- Safe to use on recovering turf.
- Minimal effect on new root development when growing back Bermudagrass (*Cynodon spp*) or Kikuyu after harvesting and during recovery of sports fields after the winter season.
- Perfect rotation partner for K1 turf herbicide group.
- Flower beds: Fusilade can be tank mixed with Pennant Magnum to provide pre and post emergent control in landscapes areas. Fusilade is a non-selective herbicide on turf – do not apply to turf areas.

Subdue Maxx[®] Turf fungicide

- *SUBDUE MAXX is one of the best preventative and early curative systemic fungicides for effective control of **Pythium blight & root rot** in your greens, at an economical cost.*
- The combination of **fast absorption** and even **systemic movement** as well as **contact action in soil**, resulting in **full plant protection.**
- MAXX technology allows for excellent tank mix compatibility with other fungicides and foliar fertilizers
- Effective on **damping off** – apply Subdue Maxx prior to or immediately after *seeding* & do a follow up application 21 days later.
- Low odour, non-staining formulation
- Long lasting residual activity for up to 21 days.

Plant Growth regulator

Primo Maxx[®] Plant growth regulator

- Provides both **turf regulation** and improved **turf quality and playability.**
- Improved **colour** and **root structure** produces **exceptional turf quality and health.**
- Reduces poa seed heads.
- Improves uptake of water and nutrients.
- Pre-stress conditioning protects lawn from heat, drought, disease, and use.
- Reduced time and money spent on mowing.
- **Primo Maxx allows you to produce the ultimate playing surface** thus enhancing the playing experience.

Wetting Agent

Qualibra[®] Wetting agent

- A penetrant and polymer in one unique product.
- Greens: **Firm, fast playing surface** without affecting the plant as it has **moist roots**
- **Fairways: 30 % reduction in water usage.**
- Quick water movement away from the soil surface.
- Qualibra assists to maintain plant health and playing surface quality.
- Prevent damaging dry patch developing.
- Make better use of irrigation resources.
- Reduce effects of drought.
- Retain healthy root mass.

Syngenta Products Application Timing

SYNGENTA APPLICATION TIMING CHART													
DISEASE	TIMING	FAVOURING TEMPERATURE	BANNER	DACOMIL WS	HERITAGE	HERITAGE MAXX	HEADWAY MAXX	INSTATA	SUBDUE MAXX	QUALIBRA	MERIDIAN	PRIMO MAXX	
Anthracnose	Dec - Feb	25 °C and more	Propiconazole										
Brown Patch	Sept - April	30 °C and more during day time. 15 °C and more at night											
Bermuda Grass Decline	Late summer to early winter following periods of overcast, warm-wet weather.												
Crabgrass	Oct	13 °C											
Dew Removal	May - Aug	1/4 - 1/2 rates & LDS											
Dollar Spot	Sept - April	15 °C - 30 °C (high humidity)											
Dry Spots	Sept - April	Localised Dry Spots											
Fading Out	Dec - Feb	25 °C - 35 °C											
Fairy Ring	May - Aug	When soil reaches 12-15 °C											
Goosegrass	Nov - Dec	16 °C											
Grey Leaf Spot	Aug - April	26 °C - 32 °C											
Large Patch	Aug - April	High Humidity											
Leaf/Stem/Stripe Rust	Aug - April	18 °C - 30 °C											
Leaf Spot /Wetling Out	Aug - Oct	4 °C - 26 °C											
Microdochium Patch	Jun - Aug	1° - 15 °C											
Mole Cricket	Sept/Oct/Dec/Jan	Apply Meridian after first rain / follow up 60 Days later.											
Necrotic Ring Spot	Nov - Feb	Thirries up to 27 °C											
Plant Growth Regulator	Jan - Dec	Above 5 °C soil temperature											
Pea Annua	March, April	Treat in Autumn											
Powdery Mildew	Aug - Oct	15 °C - 22 °C											
Pythium Leaf Blight	Nov - April	20 °C and more											
Pythium Root Rot	May - July	0 °C - 10 °C											
Red Thread	Jan - Dec	4 °C - 29 °C											
Rhizoctonia leaf and sheath spot	Dec - Feb	28 °C - 36 °C											
Seedling Damping Off	After seeding	20 °C and more											
Spring Dead Spot	March, April	Treat in autumn											
Summer Patch	Nov - Jan	Soil at 18 °C and air temp 29 °C -day time & 21 °C -at night											
Take all Patch	May - Sept	When soil reaches 4 °C - 15 °C											
Wheat Patch	Sept - April	25 °C - 30 °C											
White Grub	Sept/Oct/Dec/Jan	Apply Meridian after first rain / follow up 60 Days later.											
	BATES/HA		2 t/ha	3.5-5.2 t/ha	560-1120 g/ha	3-5 t/ha	2-3 t/ha	9 t/ha	1.7-3.5 t	10 t	1 kg	1.3 t/ha	150 ml/3 ha

DISEASE MANAGEMENT:

DISEASE	TURF TYPE	PRODUCT	RATE DESCRIPTION	RATE	APP TIMING	HIGH RISK PERIOD
ANTHRACNOSE	GREENS: Poa/Bent (Especially POA)	HERITAGE MAXX	Preventative (not more than 3 sequential apps)	560g/ha every 14 days 1120g/ha every 28 days	Dec, Jan, Feb	Jan - Feb
		BANNER		2-4 litres/ha every 14-28 days		
BROWN PATCH	GREENS: Bent/Bermuda FAIRWAYS: Kikuyu/Bermuda	HERITAGE MAXX	Preventative (not more than 3 sequential apps)	560g/ha every 14 days 1120g/ha every 28 days	Sept to March	
		HERITAGE MAXX	Nov-Feb in humid regions	560g/ha every 14 days 1120g/ha every 28 days		
		BANNER		2-4 litres/ha every 10-21 days		
DOLLAR SPOT	GREENS: All Turf All Turf	BANNER	Tank mix with Daconil	2 litres/ha every 7-14 days if tank mixed with Daconil WS	Sept to March	Nov - Feb
			3 consecutive apps of Banner only	4 litres/ha every 14-28 days		
			Preventative	Apply 3 or more consecutive apps before changing to Daconil WS	Sept to April	
		DACONIL	Curative	3.5 litres/ha every 7-10 days		
				5-6 litres/ha twice in first 7 days when infected & return to preventative programme.		

DISEASE MANAGEMENT:

DISEASE	TURF TYPE	PRODUCT	RATE DESCRIPTION	RATE	APP TIMING	HIGH RISK PERIOD
FAIRY RING	GREENS: Bent/POA Annua	HERITAGE MAXX		1120 g/ha in 1600 litres water/ha	Nov - Feb	
				Apply as soon as symptoms first appear. Add Qualibra for best results. Do a follow up application after 28 days		
GREY LEAF SPOT	GREENS: Bermuda/Paspalum	HERITAGE MAXX	Preventative (Do not apply more than 2 sequential applications)	560 g/ha every 14 days	Dec - Jan	
				1120 g/ha every 28 days		
				560 g/ha every 14 days		
				1120 g/ha every 28 days		
LEAF RUST, STEM RUST, STRIPE RUST	GREENS: Bermuda/Paspalum	HERITAGE MAXX	Preventative (Not more than 3 sequential applications)	560 g/ha every 14 days	Sept - April	
		BANNER	2 - 4 litres/ha every 14-28 days			
LEAF SPOT, (BIPOLARIS SPOT)	GREENS: Bermuda/Paspalum	HERITAGE MAXX	Preventative (Not more than 3 sequential applications)	560 g/ha every 14 days	Aug - Oct	
		BANNER	2 - 4 litres/ha every 14-28 days			
MELTING OUT (DRESCHLERIA)	FAIRWAYS: Kikuyu/Bermuda	HERITAGE MAXX	Preventative (Not more than 3 sequential applications)	560 g/ha every 14 days 1120 g/ha every 28 days	Aug - Oct	

DISEASE	TURF TYPE	PRODUCT	RATE DESCRIPTION	RATE	APP TIMING	HIGH RISK PERIOD
MICRODOCHIUM PATCH (FUSARIUM PATCH) - WG, SC, GAU, E/C	GREENS: Bent/POA Annua	HERITAGE MAXX	Preventative (not more than 3 sequential apps)	560g/ha every 14 days	Aug	July, August
				1120g/ha every 28 days		
POWDERY MILDEW		Banner		2-4 litres/ha every 14-28 days		
PYTHIUM BLIGHT & PYTHIUM ROOT ROT	GREENS: Bent/POA Annua	HERITAGE MAXX	Preventative (Do not apply more than 2 sequential applications)	1120g/ha every 28 days	Nov - Jan	
				1120g/ha every 28 days		
RED THREAD	FAIRWAYS & TEES: Cool Season		Preventative (Do not apply more than 2 sequential applications)	1120g/ha every 28 days	Nov - Jan	
				560g/ha every 14 days		
RED THREAD	FAIRWAYS & TEES: Cool Season		Preventative (not more than 3 sequential apps)	1120g/ha every 28 days	Nov - Jan	
				560g/ha every 14 days		
SUMMER PATCH	FAIRWAYS & TEES: Cool Season		Preventative (not more than 3 sequential apps)	560g/ha every 14 days	Nov - Jan	
				1120g/ha every 28 days		
RED THREAD	GREENS: Bent/POA Annua	HERITAGE MAXX	Preventative (not more than 3 sequential apps)	1120g/ha every 28 days	Sept - Feb	
				560g/ha every 14 days		

Disease Management



Notes

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Please KINDLY send all orders to **sales@talkingturf.co.za**

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Distributed in South Africa by Talking Turf cc. Registration number: 2004/106765/23

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- Rod Burke, Syngenta

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