Syngenta Research

Syngenta invests over $1.4bn per year into innovative research and development. Based in Switzerland, we have global research facilities, including pioneering turf and landscape R&D centres in Europe and America that have been instrumental in developing new solutions globally.

R&D is further supported by rigorous testing and evaluation by independent research, agronomists and a comprehensive trials programme. Our products are all manufactured to an exceptionally high standard, for ease of use and assuring consistent results. All Syngenta turf and landscape products are developed and formulated specifically for their safety and efficacy.

Contents

HERBICIDE
- Barricade 04
- Monument 05
- Pennant Magnum 06
- Tenacity 08

FUNGICIDE
- Banner Maxx 12
- Headway 13
- Heritage Maxx 15
- Medallion TL 17
- Subdue Maxx 19

INSECTICIDE
- Acelpryn 22
- Meridian 24
- Scimitar CS 25

NEMATICIDE
- Divanem 28

GROWTH REGULATOR
- Primo Maxx 32
- Bonzi 36

WETTING AGENT
- Qualibra 42

APPLICATION
- XC Nozzles 46

PIGMENT
- Ryder 50
WEEDS ARE UNSIGHTLY, CROWD OUT MORE DESIRABLE PLANTS AND COMPETE FOR SOIL NUTRIENTS AND WATER. THEY CAN ALSO BE HOME TO, AND SPREAD, PESTS AND DISEASES.
Controlling Poa for turf rejuvenation

Barricade is the selective grass-weed herbicide of choice for pre-emergence Annual bluegrass (Poa annua) control in selected turf surfaces. The Barricade programme can help to enhance success with over sowing of turf surfaces. Barricade controls susceptible weeds by preventing growth and development of newly germinated weed seeds.

Barricade enables:
- Selective control of Poa annua and other annual grass weeds
- Flexible control programmes

User experience in the US also highlights Barricade provides useful control of more than 30 grassy and broadleaf weeds including Crabgrass, Spurge, Chickweed, Oxalis, Goosegrass and more than 2 dozen other weeds are controlled when Barricade is applied before weeds emerge.

University research has demonstrated the sensitivity of Poa annua to Barricade at application rates as low as 0.56 kg/ha when applied prior to germination of target weed grasses in non-overseeded turf. Generally, higher rates widen the window of application timing giving acceptable control. The water insolvability and longevity of Barricade make applications prior to perennial Ryegrass overseeding feasible to control Poa annua without reducing Ryegrass establishment.

Overseeding established turfgrass

Barricade is uniquely suited to aid successful overseeding of established turfgrass as it has the lowest water solubility of any pre-emergent turf herbicide. The herbicide barrier it creates remains close to the surface where trials and user experience shows the small Annual bluegrass seeds will normally germinate. Perennial Ryegrass seed, however, with a large and aggressive growth rate, can grow through this barrier.

Higher seeding rates are typically used to ensure adequate population density, as weak seedlings may not have enough energy to grow through the herbicide barrier. The key is having the right rate of Barricade present to inhibit the Poa, but not the desired sown grass species.

A number of overseeding trials were conducted in major markets to study the rate and timing of Barricade for Poa annua control.

Poa annua control programme

Barricade can be applied six to eight weeks prior to overseeding. Maximum rate of application is 1.15 kg/ha. Barricade 65WG may be applied more than once over the course of the season to extend residual effects, as long as the total amount applied does not exceed the maximum annual application rate for specific turf species. All applications must be prior to weed seed germination.

Best results will be achieved with supplementary irrigation following Barricade application. Apply at least 12 mm (½ inch) of water within 14 days of application and before weed seeds germinate.

No special overseeding practices are required, other than using a minimum seeding rate of 330 kg/ha and maintaining a moist seedbed to enhance seedling growth. More frequent irrigation regimes may be required to optimize Ryegrass rooting.

The objective of these rates and timings of Barricade is to provide 70% or better control of Poa annua and aid the overseeding of Ryegrass in established turf grass. Primax Max should also be used with overseeding programmes for stronger establishment of new seedlings and enhanced root development (see page five for further details).

When used for the pre-emergence control of annual weed grasses in turf surfaces Barricade will also control selected broad-leaved weeds, including Chickweed, Pigweed and Witch grass.

- **Barricade 65WG**
  - Dose rates: 0.56–2.5 kg/ha
  - Pack size: 250 g
  - Water volume: 185 l/ha
  - Active ingredient: Prodiamine
  - Rates of Al: 660 g/kg
  - Target weeds: Annual bluegrass (Poa annua), Barnyard grass, Crabgrass, Witch grass, Johnson grass, Chickweed, Pigweed
  - Activity: Pre-emergence control
  - Application technique: Boom sprayer

Refer to the registered label for full details and instructions for use.

Selective weed control in established turf

Monument is a selective herbicide for the control of key broad-leaved weeds and grass weeds in established turf.

**Monument can help maintain fine turf surfaces by:**
- **Control of broad-leaved weeds**
- **Effective suppression of grass weed growth, including crabgrass and tuftedgrass**
- **Removing winter weeds in dormant turf**

The active ingredient in Monument 75WG, Trifloxysulfuron-sodium is an acetolactate synthase (ALS) inhibitor herbicide that has been developed by Syngenta for post-emergence weed control in bermudagrass and zoysiagrass turf. Monument 75WG provides control of major broad-leaved and grass weeds, including purple and yellow nutsedge, kyllings, oxalis, Poa annua, broadleaf signalgrass, dandelion, white clover, seedling Virginia buttonweed, and henbit at very low use rates. Monument will also suppress growth of Bahiagrass, Dallegrass, Torpedograss, and Crabgrass.

**Behavior in soil**

The long-term residual efficacy of Monument is strongly affected by soil type, pH and moisture. Dry and cool conditions slow down the natural degradation of the active ingredient (Al) and considerably extend the persistence of herbicidal activity.

In neutral to alkaline soils encountered in most golf course situations, the degradation of the active ingredient is relatively slow, with trials demonstrating good levels of 50% or retention (DT50) three weeks after application. In acidic soils of pH 5, however, enhanced degradation may give reduced levels of persistent activity. Due to the pH dependency of adsorption, the mobility of Trifloxysulfuron-sodium ranges from highly mobile to practically immobile in different soil types.

**Monument programmes**

Monument is highly effective at low use rates. In practice application rates range from 24–37 g/ha, depending on target weed species growth and prevailing weather conditions. A repeat application after four to six weeks may be necessary for control of some weed species.

- **Monument 75WG**
  - Dose rates: 24–37 g/ha
  - Pack size: 4x10x5x5gm pack
  - Active ingredient: Trifloxysulfuron-sodium
  - Rates of Al: 750 g/kg
  - Target weeds: Yellow Nutsedge, Spurge, Poa annua, Bahia grass, Crabgrass
  - Activity: Post-emergence control
  - Application technique: Boom sprayer

Refer to the registered label for full details and instructions for use.

Monument herbicide can also be used in dormant, non-overseeded turf for control of winter weeds, such as Poa annua, clover, and henbit, typically at use rates of 23 g/ha.
Pennant Magnum Turf Herbicide delivers effective control of various broadleaf weeds and grasses through an optimised formulation (of 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.

What Pennant Magnum offers you:

- Optimised S-metolachlor formulation with 35% more herbicidal activity
- Pre-emergent control of various annual grasses and broadleaf weeds
- Safe to use on recovering turf
- Minimal effect on new root development when growing back Bermudagrass (Cynodon spp) after harvesting and during recovery of sports fields after the winter season

Pennant Magnum can be used on most established warm season turf species:

**Warm Season Turf Grasses**
- Bermudagrass
- Zoysiagrass
- Seashore paspalum

Pennant Magnum can deliver up to 8 weeks of residual control when applied prior to weed emergence. High safety to newly developing turf grass roots give flexibility during the high risk periods of turf establishment. Irrigate for activation of Pennant Magnum, if rainfall has not occurred within seven days of application.

**Flexible pre-emergent weed control in turf production, golf courses and sports fields**

Pennant Magnum can be applied to the cut face straight after harvesting to ensure that regrowth for the first six weeks is without the competition of weeds.

<table>
<thead>
<tr>
<th>Target Weeds</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm Season Grasses (Bermudagrass, Centipedegrass, St. Augustinegrass, Bahiagrass and Zoysiagrass) including Commercial St. Augustine grass Sod Production</td>
<td>1.5–2.2 l/ha</td>
</tr>
</tbody>
</table>

**Active Ingredient**

Pennant Magnum contains 914 g/L S-metolachlor, a member of the acetamide group of herbicides

**Pennant Magnum**

- **Dose rates**: 1–2 l/ha x 2 applications 4 to 6 weeks apart
- **Pack size**: 1l
- **Active Ingredient**: S-metolachlor
- **Rates of Al**: 914 g/L
- **Target weeds**: Goosegrass, Yellow Nutsedge, Crabgrass, Chewgrass, Burclover
- **Activity**: Pre-emergence
- **Application technique**: Boom sprayer, knapsack sprayer

Refer to the registered label for full details. Not for use on greens, tees and aprons.
Tenacity herbicide gives you the option to treat cool-season turfgrass at seeding, to prohibit weeds from germinating, and give new grass a chance to flourish.

But it doesn’t stop there. Tenacity also offers pre- and post-emergence control of 46 broadleaf and grassy weeds—including actively growing crabgrass, goosegrass, nimblewill and bentgrass.

Tenacity is a systemic pre-emergence and post-emergence herbicide for the selective control and residual control of weeds in turfgrasses. When applied pre-emergence, weeds absorb Tenacity during emergence from the soil.

**Seeding applications**
Unlike most herbicides, Tenacity can be applied anytime you are seeding, including:

- Bare ground seeding or selective renovations
- Overseeding of established turf
- Fall, spring, or anytime you choose to seed

**Excellent crabgrass control two weeks after seeding of perennial ryegrass**
Ohio State University, July 2007.

**Effective pre- and post-emergent control of tough weeds**
Tenacity can control several weeds like:

- Crabgrass
- Clover
- Goosegrass
- Yellow nutedge
- Oxalis

When applied at or prior to seeding of ryegrass, Tenacity will reduce weed competition as new grass begins to emerge. This helps ensure that your customers get the uniform lawn that they desire.

When used post-emergence, susceptible weeds absorb Tenacity through foliar contact and soil absorption. Foliage of treated weeds cease growth after application, then turn white (loss of chlorophyll) and death may take up to three weeks. A repeat application is required after two to three weeks for improved post-emergence weed control. A non-ionic surfactant should be added in post-emergence applications.

**Controls crabgrass whenever you need it**

- **Pre-emergence crabgrass control applied at seeding of perennial ryegrass**
  - On the left, the test plot is untreated. As you can see from the photo on the right, Tenacity at 350 g/ha (0.4 l/ha) controlled most weeds.
  - To remove crabgrass apply three applications at the 5-oz (0.4 l/ha) rate on a three-week interval. This selectivity makes Tenacity a preferable option to resodding.

- **Evidence of effectiveness**
  - By affecting key plant cycles of chlorophyll production and photosynthesis, Tenacity is able to kill undesirable weeds and grasses. This results in a visual bleaching of these weeds and grasses prior to necrosis.
  - Occasionally, white tips can be seen on desirable grasses following treatment. This is a temporary symptom, as the tips will be removed at the next mowing. For best post-emergence control apply to less than 4 tiller crabgrass and goosegrass.

- **Tenacity doesn’t just control emerged crabgrass, but the residual activity helps prevent additional crabgrass from emerging. This provides a wide application window.**

- **Tenacity is the only herbicide available that offers control of crabgrass and goosegrass both pre- and post-emergence up to the fourth tiller.**

**Evidence of effectiveness**

- By affecting key plant cycles of chlorophyll production and photosynthesis, Tenacity is able to kill undesirable weeds and grasses. This results in a visual bleaching of these weeds and grasses prior to necrosis.

- Occasionally, white tips can be seen on desirable grasses following treatment. This is a temporary symptom, as the tips will be removed at the next mowing. For best post-emergence control apply to less than 4 tiller crabgrass and goosegrass.

- Tenacity may cause temporary whitening of turfgrass foliage. In general, symptoms appear five to seven days after application and last for several weeks. A repeat application to the same site causes less whitening of the plant tissue.

- Tenacity is an effective herbicide for weed control prior to or during seeding of certain turfgrasses during turf renovation. If used preemergence in established turf, tank mixtures with preemergence herbicides such as Barricade 65WG Herbicide are recommended for longer residual and broad spectrum weed control.

**Rate of use**

- Pre-emergent application: 280-560 ml/ha
- New seeding: 350-560 ml/ha
- Post-emergent treatment: 280-560 ml/ha
- Dormant Bermuda Grass application only: 350 ml/ha
- Spot treatment: 535 ml/ha

- Volume of water: 300-400 l/ha
THE CLIMATIC CONDITIONS OF HIGH TEMPERATURES AND HIGH HUMIDITY ARE ESPECIALLY SUITABLE TO ALLOW THE GROWTH OF MANY PATHOGENIC FUNGI.
Banner Maxx is an excellent turf fungicide offering fast, highly effective control of a broad spectrum of turf diseases.

- Fast uptake and systemic movement – gets to work quickly and protects turf as it grows
- Excellent control of Dollar Spot, Brown Patch, Anthracnose, Red Thread, Pink Patch, Summer Patch, Necrotic Ring Spot, Leaf spot, Gray Leaf spot, Fusarium Patch
- Preventative, curative and eradicant activity
- Approved for application through boom and knapsack sprayers

Banner Maxx is quickly taken up by turf plants, providing fast protection from disease attack and avoiding disruption in mowing schedules. Movement up into new leaf growth ensures leaves are protected from new fungal attack. Best results are achieved from Banner Maxx application when the disease is in the early stage of development, before visible damage to the turf occurs.

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

- Preventative
  Prevents visible disease damage occurring
- Curative
  Controls disease when it has entered the leaf, but before symptoms can be seen
- Eradicant
  Limits disease spread and aids recovery of new leaf

Banner Maxx utilises the unique Syngenta Maxx formulation – specifically designed for turf products to optimise product uptake and performance, whilst assuring exceptional turf safety. Maxx formulated products are easy to use, clean and fully approved as safe for operators, sports turf users and the environment.

How does it work?
Banner Maxx is a demethylation inhibitor (DMI) fungicide. The active ingredient targets fungal pathogens inside the plant. It works by inhibition of C-14 demethylation during ergosterol synthesis. In preventing the biosynthesis of sterols, essential for cell membrane form and function, development of disease is effectively halted.

Where can Banner Maxx be used?
Banner Maxx is approved for disease control on all managed amenity turf surfaces.

<table>
<thead>
<tr>
<th>Banner Maxx</th>
<th>Dose rates</th>
<th>3.2–6.4 l/ha or 3.2–12.8 l/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pack size</td>
<td>5l</td>
<td></td>
</tr>
<tr>
<td>Water volume</td>
<td>400–1000 l/ha</td>
<td></td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Propiconazole</td>
<td></td>
</tr>
<tr>
<td>Rates of AI</td>
<td>156 g/l</td>
<td></td>
</tr>
<tr>
<td>Turf &amp; ornamental diseases</td>
<td>Dollar spot, Brown patch, Anthracnose, Red thread, Pink patch, Summer patch, Necrotic ring spot, Leaf spot, Gray leaf spot, Fusarium patch</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Systemic</td>
<td></td>
</tr>
<tr>
<td>Application technique</td>
<td>Boom sprayer, Knapsack sprayer</td>
<td></td>
</tr>
</tbody>
</table>

Double action and long-lasting disease protection

Headway is recommended for control of certain pathogens causing foliar, stem and root disease, including leaf and stem blights, leaf spots, patch diseases, mildews, anthracnose, fairy rings, molds and rust in turf grass plants.

- Double action fungicide with disease control activity from leaf to root
- Approved for control of key foliar and soil-borne turf diseases: Pythium spp., Magnaporthe poae, Gaeumannomyces graminis var. avenae, Fusarium patch, Limonomyses roseipellis.

Headway contains two of the world’s most successful turf fungicide active ingredients, providing disease protection both inside and outside the plant.

- Double action fungicide with disease control activity from leaf to root
- Approved for control of key foliar and soil-borne turf diseases: Pythium spp., Magnaporthe poae, Gaeumannomyces graminis var. avenae, Fusarium patch, Limonomyses roseipellis.

Label approvals for:

- Brown Patch
- Anthracnose
- Leaf Spot

Combining both active ingredients in one pre-formulated product gives:

- Improved performance
- Increased flexibility for greater convenience
- Wider application window – easy to use
- Complementary power of two activities
- Dual modes of action minimise resistance potential
Double action and long-lasting disease protection

Turf protection through the growing season

Headway provides a fast, effective, double action systemic fungicide perfectly suited for use throughout the growing season.

Pack size:

3 l

Rates of use:

Apply Headway at an application rate of between 4.6–9.2 l/ha depending on disease. Check the label for further information.

Low rate of application = faster tank mixing and fewer containers to dispose of
Low water volume = faster spraying

Application timing:

For best results apply Headway as a preventative application when conditions become favourable for disease infection – alternatively, spray at the first signs of disease presence.

Headway is best applied during periods of turf growth, with a minimum spray interval of 14 days between applications. Use no more than two sequential Headway applications, as part of an Integrated Turf Management program.

Application technique:

Headway may be applied by boom, walkover and knapsack sprayers. Use a medium to fine spray pattern, to achieve good coverage and spray retention on the leaf.

Proven Performance

Headway has been extensively tried and tested on high quality turf at the state of the art Syngenta turf research facility, as well as by independent researchers and turf managers at prestigious golf and sports turf facilities.

In Michigan State University fungicide trials, leading US turf researcher, Dr Joe Vargas reports Headway treatments as being "especially efficacious".

Formulation for turf application

The Headway formulation is better for turf and for sprayer operators.

The formulation creates significantly smaller particles, resulting in faster uptake by the leaf and easier movement through the plant:

• Targets disease more effectively
• Continually redistributes active through the leaf to protect new growth
• Systemic movement replenishes fungicide protection after moving

Rapid uptake into the leaf with the majority of the product absorbed within one hour of application reduces the risk of Headway being washed off – ensuring maximum use by the plant and minimal environmental loss.

The Headway formulation is extremely turf safe – with less risk of turf damage or discolouration and reducing stress on plants.

For sprayer operators the Headway formulation ensures:

• Easier mixing
• Virtually no odour
• Clear spray solution for clean leaves
• No clogging of filters
• Simple one-can solution for twin-action disease control

Naturally powerful disease control

Heritage Maxx offers turf managers the broadest labelled spectrum disease control of all turf fungicides.

Heritage Maxx is a systemic strobilurin fungicide, taken up by actively growing plants, foliage, crown and roots.

The active ingredient, azoxystrobin, moves through the xylem system to effectively protect turf as it grows. Heritage Maxx is the only strobilurin turf fungicide taken up by the roots, ensuring very high levels of total product uptake and beneficial effects on soil-borne pathogens.

The active ingredient moves within the plant, continuously spreading into vulnerable new growth and protecting against new disease attack to give long-lasting control.

Heritage Maxx is a great option during periods of active turf growth. The systemic movement distributes the active ingredient throughout the plant, ensuring that not all disease protection is mown off with the first cut after application, as can occur with contact fungicides during periods of fast turf growth.

Five-way turf disease protection

• Targets disease attack before damage is caused
• Gives long lasting protection
• Is a systemic fungicide belonging to the strobilurin group of active ingredients
• Has natural origins
• Root, crown and foliar uptake

The origins of Heritage Maxx lie in the natural fungicides produced by wood-rotting fungi found on the forest floor. Syngenta has harnessed the power of these naturally occurring fungicides to produce a truly broad-spectrum turf fungicide, with an excellent environmental profile.

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

Systemic movement

Heritage Maxx is a systemic strobilurin fungicide, taken up by actively growing plants, foliage, crown and roots. The active ingredient, azoxystrobin, moves through the xylem system to effectively protect turf as it grows. Heritage Maxx is the only strobilurin turf fungicide taken up by the roots, ensuring very high levels of total product uptake and beneficial effects on soil-borne pathogens.

The active ingredient moves within the plant, continuously spreading into vulnerable new growth and protecting against new disease attack to give long-lasting control.

Heritage Maxx is a great option during periods of active turf growth. The systemic movement distributes the active ingredient throughout the plant, ensuring that not all disease protection is mown off with the first cut after application, as can occur with contact fungicides during periods of fast turf growth.

Formulation for turf application

The Headway formulation is better for turf and for sprayer operators.

The formulation creates significantly smaller particles, resulting in faster uptake by the leaf and easier movement through the plant:

• Targets disease more effectively
• Continually redistributes active through the leaf to protect new growth
• Systemic movement replenishes fungicide protection after moving

Rapid uptake into the leaf with the majority of the product absorbed within one hour of application reduces the risk of Headway being washed off – ensuring maximum use by the plant and minimal environmental loss.

The Headway formulation is extremely turf safe – with less risk of Headway being washed off – ensuring maximum use by the plant and minimal environmental loss.

The Headway formulation is better for turf and for sprayer operators.

The formulation creates significantly smaller particles, resulting in faster uptake by the leaf and easier movement through the plant:

• Targets disease more effectively
• Continually redistributes active through the leaf to protect new growth
• Systemic movement replenishes fungicide protection after moving

Rapid uptake into the leaf with the majority of the product absorbed within one hour of application reduces the risk of Headway being washed off – ensuring maximum use by the plant and minimal environmental loss.

The Headway formulation is extremely turf safe – with less risk of turf damage or discolouration and reducing stress on plants.

For sprayer operators the Headway formulation ensures:

• Easier mixing
• Virtually no odour
• Clear spray solution for clean leaves
• No clogging of filters
• Simple one-can solution for twin-action disease control

Naturally powerful disease control

Heritage Maxx offers turf managers the broadest labelled spectrum disease control of all turf fungicides.

Heritage Maxx is a systemic strobilurin fungicide, taken up by actively growing plants, foliage, crown and roots.

The active ingredient, azoxystrobin, moves through the xylem system to effectively protect turf as it grows. Heritage Maxx is the only strobilurin turf fungicide taken up by the roots, ensuring very high levels of total product uptake and beneficial effects on soil-borne pathogens.

The active ingredient moves within the plant, continuously spreading into vulnerable new growth and protecting against new disease attack to give long-lasting control.

Heritage Maxx is a great option during periods of active turf growth. The systemic movement distributes the active ingredient throughout the plant, ensuring that not all disease protection is mown off with the first cut after application, as can occur with contact fungicides during periods of fast turf growth.

Five-way turf disease protection

• Targets disease attack before damage is caused
• Gives long lasting protection
• Is a systemic fungicide belonging to the strobilurin group of active ingredients
• Has natural origins
• Root, crown and foliar uptake

The origins of Heritage Maxx lie in the natural fungicides produced by wood-rotting fungi found on the forest floor. Syngenta has harnessed the power of these naturally occurring fungicides to produce a truly broad-spectrum turf fungicide, with an excellent environmental profile.

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

Systemic movement

Heritage Maxx is a systemic strobilurin fungicide, taken up by actively growing plants, foliage, crown and roots. The active ingredient, azoxystrobin, moves through the xylem system to effectively protect turf as it grows. Heritage Maxx is the only strobilurin turf fungicide taken up by the roots, ensuring very high levels of total product uptake and beneficial effects on soil-borne pathogens.

The active ingredient moves within the plant, continuously spreading into vulnerable new growth and protecting against new disease attack to give long-lasting control.

Heritage Maxx is a great option during periods of active turf growth. The systemic movement distributes the active ingredient throughout the plant, ensuring that not all disease protection is mown off with the first cut after application, as can occur with contact fungicides during periods of fast turf growth.
Naturally powerful disease control

Translaminar movement
In addition to xylem systemicity, the translaminar movement of Heritage Maxx moves the active ingredient from the point of application through the leaf structure, to provide even distribution throughout the leaf. The active ingredient does not accumulate at leaf tips or margins.

How does it work?
Heritage Maxx contains azoxystrobin and is the only truly xylem systemic strobilurin fungicide. This active ingredient is a Quinone Outside Inhibitor (QOI) and works by preventing electron transfer in the mitochondria, meaning the pathogen has insufficient energy for aerobic respiration thus growth.

Proven results
Heritage Maxx is one of the most widely used turf fungicides around the world.

<table>
<thead>
<tr>
<th>% disease</th>
<th>Brown Patch</th>
<th>Unsprayed</th>
<th>Heritage Maxx</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 July</td>
<td>9.6%</td>
<td>2.8%</td>
<td>2.8%</td>
<td>2.8%</td>
</tr>
<tr>
<td>27 July</td>
<td>8.6%</td>
<td>1.8%</td>
<td>1.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>5 August</td>
<td>9.6%</td>
<td>2.8%</td>
<td>2.8%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% disease</th>
<th>Gray Leaf Spot</th>
<th>Unsprayed</th>
<th>Heritage Maxx</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 July</td>
<td>19%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>16 July</td>
<td>17%</td>
<td>4.2%</td>
<td>4.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>14 July</td>
<td>15%</td>
<td>3.9%</td>
<td>3.9%</td>
<td>3.9%</td>
</tr>
</tbody>
</table>

Core Recommendations
- Application rate: 3.0 l/ha
- Maximum four applications per year

Where to use
All managed turf and amenity grassland, including all areas of the golf courses and sports fields.

Water volume
300-500 l/ha

Application technique
All types of spray equipment

Get the best from Medallion TL Contact+ protection

Medallion TL application top tips
Medallion TL may be applied through all types of commonly used turf spray equipment including tractor mounted/trailed, self-propelled and knapsack sprayers. Medallion TL is recommended to be applied in 300-500 litres water/ha. For optimum results use the drift reducing Syngenta XC Turf Nozzles to ensure even spray coverage and enhance all round coverage and spray retention on the leaf – delivering product more effectively into the target zone.

Syngenta XC Nozzle benefits
- Maintains an even spray on undulating ground
- Reduce risk of spray drift
- Enhances all-round leaf coverage
- Enable lower water volumes

In Brief
Medallion TL is the exciting fast acting Contact+ turf fungicide from Syngenta. Proven to give exceptional longer lasting protection from several diseases (antrachnose, brown patch, leaf blight and fusarium).

Core Recommendations
- Application rate: 3.0 l/ha
- Maximum four applications per year

Where to use
All managed turf and amenity grassland, including all areas of the golf courses and sports fields.

Water volume
300-500 l/ha

Application technique
All types of spray equipment
Targeting turf disease

Medallion TL is a broad-spectrum turf fungicide with long-lasting protective and Contact+ properties. The Contact+ activity of Medallion TL works on the leaf, in the thatch and at the soil surface, to effectively protect turf and reduce pathogen populations to lower risk of disease outbreak. Preventive fungicide applications are especially important during periods of slow or zero growth when any damage to surface quality will be slow to repair.

Preventative fungicide applications are especially important to prevent the development of disease. Apply fungicide programmes preventatively during periods of disease risk to maintain surface quality. Medallion TL was bio-inspired by a naturally occurring antifungal compound of soil bacteria. It will control selected turf disease pathogens, but leave soil microbes with different membrane protein structures unaffected.

Get the best from Medallion TL Contact+ protection

Trials have shown that Medallion TL rapidly bonds onto the leaf wax layer – making it rainfast within one hour.

Fusarium Patch

Anthracnose

Rainfast within one hour

Trials have shown that Medallion TL rapidly bonds onto the leaf wax layer – making it rainfast within one hour.

Key Tips

Use appropriate Integrated Turf Management (ITM) techniques where practical to maintain stress-free plant health and reduce disease risk.

Remain vigilant for changing weather conditions conducive to turf disease. Use the free website www.greencast.ae for disease and weather forecasts.

Apply fungicide programmes preventatively during periods of disease risk to maintain surface quality.

Medallion TL was bio-inspired by a naturally occurring antifungal compound of soil bacteria. It will control selected turf disease pathogens, but leave soil microbes with different membrane protein structures unaffected.

Protective Shield

Medallion TL creates a protective shield on the leaf surface.

Tackling disease pathogens in the thatch knocks down spore numbers and reduces disease pressure – enhancing the duration of protection delivered.

Rainfast within one hour

Trials have shown that Medallion TL rapidly bonds onto the leaf wax layer – making it rainfast within one hour.

Get the best from Medallion TL Contact+ protection

Trials have shown that Medallion TL rapidly bonds onto the leaf wax layer – making it rainfast within one hour.

The industry standard for Pythium protection

Pythium is one of the most damaging turf diseases affecting surface quality. Once Pythium infects a plant the affected tiller usually dies, leading to gaps in the sward that spoil surface trueness and allow weed ingress.

Subdue Maxx offers:

- Exceptional protection against Pythium
- Residual control
- Leaf and root uptake
- Systemic and contact activity

Subdue Maxx has set a worldwide industry standard in protection against Pythium infection, as well as a range of associated turf diseases including damping off and Yellow tuft (Downy mildew). Exceptional levels of performance and long residual activity for up to 21 days make Subdue Maxx an integral part of disease management programmes wherever Pythium is an issue.

How does Subdue Maxx work?

Subdue Maxx belongs to the phenylamide group of fungicides. It stops disease growth and prevents the development of disease within the plant.

As a systemic fungicide, Subdue Maxx enters the plant in two ways:

1. Absorbed into the leaves and stems, after which it cannot be washed off by rain
2. Absorbed by the roots and translocated throughout the plant.

Subdue Maxx also provides contact activity. Some active ingredient remains on the surface of the soil and is absorbed onto the soil particles and organic matter, where it controls pathogens on contact.

Subdue Maxx is highly soluble and will penetrate into the soil to provide good root protection. It can be used on all major turfgrass species, with exceptional turf safety. For resistance management in Pythium control, Subdue Maxx can be alternated with Heritage Maxx.

Subdue Maxx utilises the unique Syngenta Maxx formulation – specifically designed for turf products to optimise product uptake and performance, whilst assuring exceptional turf safety. Maxx formulated products are easy to use, clean and fully approved as safe for operators, sports turf users and the environment.

Preventive protection for better quality turf

Subdue Maxx will provide optimal disease control if applied preventively. It penetrates the plant while a portion stays on the outside of the plant to stop spore germination and thereby prevent disease.

Subdue Maxx

Dose rates 1.6-3.2 l/ha
Pack size 1 l
Water volume 400-2000 l/ha
Active Ingredient Metalaxyl-M
Rates of AI 22.0%, 240 g/l
Turf diseases Pythium infects, Pythium damping off, Yellow tuft (Downy mildew)
Activity Systemic, Contact
Application technique Boom spray, Knapsack spray

Application timing

The first seasonal application of Subdue Maxx should be made when conditions are becoming optimal for Pythium development: temperatures ranging from a low of 20°C to a high temperature of 30°C and approximately 90% relative humidity. Up to three applications of Subdue Maxx can be made per season.

Curative measures for Pythium

If applied as an early curative when Pythium is first noticed in hot spots, or in indicator locations such as low, wet areas, Subdue Maxx will prevent the spread of mycelial growth to healthy plant tissues. Since Subdue Maxx has activity on and within the plant, it is able to stop disease from further germination and will control what is already there.

If Pythium is noted on the hot spots, it is advisable to treat these areas with a quick knockdown product and then apply Subdue Maxx for long-term protection.

Disease control programmes reliant on less effective products, such as phosphates, frequently experience higher incidences of more damaging Pythium attacks. In these situations use an effective knockdown product, followed by Subdue Maxx application for long term protection.

Where only a little disease is evident it is usual to differentiate Brown Patch mycelia from Pythium mycelia in the early stages. In these situations consider applying a tank-mix combination of Subdue Maxx and Heritage Maxx for control of both diseases.
HIGH TEMPERATURE AND HUMIDITY ENCOURAGES RAPID GROWTH AND DEVELOPMENT IN INSECT PESTS. THIS CAN LEAD TO MULTIPLE GENERATIONS IN A SEASON AND SUSTAINED PEST ATTACK.
INSECTICIDE

Acephryn Turf Insecticide provides unmatched, season long grub and caterpillar control. The benefits are protection for your turf against key insect pests as well as peace of mind that you are looking after yourself, your staff and people enjoying the greenspace.

What Acelepryn offers you:

- Up to 6 months protection at the higher application rate
- Controls a wide range of turf pests such as Army worms, White grubs, Billbugs, European crane fly, Sod webworm

Excellent White Grub Control with Acelepryn

Acephryn is very active against 1st and 2nd instar larvae of the most destructive turf infesting grub species. Acelepryn provides excellent grub control at peak adult flight. This timing can be monitored by the increasing activity of adult beetles, usually during spring and early summer. Acelepryn will provide excellent curative caterpillar control in turfgrass and should be applied when pests/damage is observed.

Accuracy and performance

To achieve great results, accurate application is important

<table>
<thead>
<tr>
<th>Target</th>
<th>Pest</th>
<th>Application Rate</th>
<th>Syngenta Nozzle</th>
<th>Water Volume</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foliar</td>
<td>Turf caterpillars, Armyworm, Cutworm, Sod webworm</td>
<td>0.15 - 0.3 l/ha</td>
<td>XC 04 or XC 025</td>
<td>200 - 500 l/ha</td>
<td>2 to 4 bar</td>
</tr>
<tr>
<td>Roots</td>
<td>Stem weevil, Hunting billbug</td>
<td>0.6 - 1.5 l/ha</td>
<td>XC 08</td>
<td>600 - 1000 l/ha</td>
<td>2 to 4 bar</td>
</tr>
<tr>
<td>Roots</td>
<td>White grubs, Billbug larvae</td>
<td>0.6 - 1.2 l/ha</td>
<td>XC 08</td>
<td>600 - 1000 l/ha</td>
<td>2 to 4 bar</td>
</tr>
</tbody>
</table>

Refer to the registered label for full details and instructions for use

Active Ingredient

ACELEPRYN contains 200 g/L chlorantraniliprole, a member of the anthranilic diamide insecticides

| GROUP | 28 | INSECTICIDE |
Meridian insecticide offers more effective control of key soil pests

The active ingredient in Meridian, Thiamethoxam, is a powerful new-generation neonicotinoid, formulated to provide higher water solubility for faster results, along with significant practical benefits in use.

Meridian has been shown to be highly effective in controlling Ants (Fire Ants), Beetle, Bugs, Thrips, Whitefly, and Grass Hoppers.

**Key benefits of Meridian include:**
- Controls grubs and other soil pests
- Highly effective at low rates of application
- Can be applied preventively or when small white grubs/juvenile mole crickets are present
- Easy to use formulation

Meridian offers high levels of pest control from low rates of use and reduced environmental loading. High water solubility – at least eight times greater than other soil acting insecticides – gives even distribution in the soil and contributes to rapid and efficient insect control.

**How does Meridian work?**

Meridian works in a different way and with an alternative mode of action to all existing organophosphates, carbamates and pyrethroid insecticides. 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, thereby preventing further damage to the turf. Death of the insect generally occurs within one or two days of ingestion of the active ingredient.

**Meridian can be used:**

- **Preventively**
  - Before damage from soil pest activity or egg hatch of larval pests
  - Application can be timed to fit in with turf maintenance programmes
  - Long-lasting effects give effective control through periods of soil pest egg hatch

- **Curatively**
  - Rapid action quickly stops further turf damage from larval feeding
  - Curative application of Meridian following initial larval activity can provide effective protection against subsequent egg hatch

**Application advice**

To target soil pests Meridian should be applied with sufficient water volume to achieve good penetration of thatch and into the soil. Select nozzles designed to enhance turf penetration. Aeration, thatch removal or spiking turf surfaces may aide treatment penetration. The inclusion of a wetting agent or surface surfactant in tank mix with Meridian may enhance soil penetration, especially in conditions where dry patch has been noted. Check tank-mix compatibility with your agronomic prior to treatment. Irrigate with at least 6mm of water as soon as is possible after application.

**Meridian 25WG**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose rates</td>
<td>250 g/ha</td>
</tr>
<tr>
<td>Pack size</td>
<td>25 g, 500 g, 1 kg</td>
</tr>
<tr>
<td>Water volume</td>
<td>Min 400 l/ha</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Thiamethoxam</td>
</tr>
<tr>
<td>Rates of AI</td>
<td>250 g/kg</td>
</tr>
<tr>
<td>Target pests</td>
<td>Ants</td>
</tr>
<tr>
<td>Application technique</td>
<td>Boom sprayer</td>
</tr>
</tbody>
</table>

Refer to the registered label for full details and instructions for use

---

Fast, effective pest control, delivered by micro-encapsulate formulation

Scimitar CS utilizes one of the world’s most potent and cost-effective synthetic pyrethroid insecticides for the control of turf pests. The outstanding insecticide is delivered by an exceptional Syngenta formulation, that gives activity on a broad spectrum of pests both by contact and by ingestion.

**The Scimitar advantage**

Scimitar CS is a pyrethroid insecticide in a unique water-based, microencapsulated formulation able to deliver:

- Broad-spectrum insect control
- Quick results
- Long-term activity
- Low use rates
- Minimal environmental impact
- No odour

**Superior control in minutes**

The high-performance insecticide controls a variety of turf, landscape, and ornamental pests quickly with lasting results to maintain plant health and damage free condition.

**How does Scimitar work?**

The active ingredient in Scimitar CS, lambda-cyhalothrin, rapidly penetrates the insect pest’s cuticle and causes disruption of the nervous system by interfering with sodium channels – leading to a rapid knock-down of the pest. The damaging feeding activity of pests stops within minutes, followed by paralysis and death.

Furthermore, anti-feeding and repellency effects extend protection of turf and ornamental plants, which includes the prevention of potential virus transmission by insects carrying disease. The micro-encapsule formulation of Scimitar CS, developed by Syngenta, optimises targeting of insect pests and ensures rapid results.

Scimitar CS is compatible with most other insecticides and fungicides and can be used in curative or preventative control situations, providing good residual protection under a wide variety of conditions.

**Residual control at low rates**

Scimitar is highly active even at low rates. The flexibility of recommended application rates enables cost effective, quick, residual control, along with opportunities for treating light infestations or maintenance pest control. The microencapsulated water-based formulation delivers extended protection and exceptional plant safety.

**Summary**

Scimitar CS is a pyrethroid insecticide in a unique water-based, microencapsulated formulation able to deliver effective control of turf pests. The high-performance insecticide controls a variety of turf, landscape, and ornamental pests quickly with lasting results to maintain plant health and damage free condition.

**Easy on the environment**

When applied as directed, Scimitar CS poses little threat to non-target organisms. As with any pyrethroid insecticide, care should be taken to avoid contact with beneficial insects.

The active ingredient in Scimitar CS breaks down to natural products in the environment, with no lasting effects.

Syngenta insecticides based on Scimitar technology are approved by major regulatory authorities and sold worldwide.

**Scimitar CS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose rates</td>
<td>0.8–3.2 l/ha</td>
</tr>
<tr>
<td>Pack size</td>
<td>1 l</td>
</tr>
<tr>
<td>Water volume</td>
<td>800–1200 l/ha</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Lambda-cyhalothrin</td>
</tr>
<tr>
<td>Rates of AI</td>
<td>100 g/l (9.7 % w/w)</td>
</tr>
<tr>
<td>Target pests</td>
<td>Ants (Fire Ants), Army ants, Cutworms, Earwigs, Fleas, Mites, Grass Hopper, Mosquito</td>
</tr>
<tr>
<td>Activity</td>
<td>Contact and ingestion</td>
</tr>
<tr>
<td>Application technique</td>
<td>Boom sprayer</td>
</tr>
</tbody>
</table>

Refer to the registered label for full details and instructions for use
Feeding by nematodes may destroy plant roots, curtailing the uptake of minerals and water from the soil. The feeding wounds produced by nematodes are used by some fungi to gain entry, causing root-decay diseases.
Divanem nematicide delivers excellent turf quality through proven, broad-spectrum control on golf course tees, greens and fairways, and is safe for use on all turfgrass species. The innovative formulation is designed to move quickly into the soil to protect roots where nematodes are most active, which provides drought tolerance and quicker recovery from stress.

Proven Performance
Powered by the trusted active ingredient abamectin, Divanem is an enhanced formulation that delivers broad-spectrum nematode control, including the three most damaging species—sting, root-knot and lance. Divanem provides durable, stress-tolerant turf, enhances root growth and stays where you need it most.

Application Recommendations
Turf should be wet prior to application, and a wetting agent or soil surfactant should be tank-mixed with Divanem. For best results, applications should be made during mornings when light levels are low and dew is present. If no dew is present, a short irrigation cycle should be run to moisten turf prior to application.

Watering In

<table>
<thead>
<tr>
<th>Watering In</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Watering In</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 1</td>
<td>Irrigate with 6.35 mm of water within one hour after application.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option 2</td>
<td>Irrigate with 0.125 inches of water within one hour after application and another 0.125 inches of water within 24 hours.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Divanem helps turf recover quickly from aerification stress

Divanem moves into the soil where nematodes are most active, providing enhanced drought tolerance compared to untreated turf. Nematode-damaged roots not only absorb less water but are also more susceptible to disease. When combined with Heritage Maxx fungicide, Divanem can further improve turf quality, density and quality, while providing enhanced biotic and abiotic stress tolerance.

For additional information and trial data, please visit www.greencast.ae

ABA 0.0 gai/ha ABA 9.4 gai/ha ABA 18.8 gai/ha ABA 37.5 gai/ha ABA 75.0 gai/ha

Quicker Recovery from Stress
Divanem protects roots from nematode damage so root system quality and mass can increase drastically. Deeper, more dense roots allow for healthier, stronger turf that maintains the highest quality above and below ground, allowing quicker recovery from stress, including aerification.

Enhanced Drought Tolerance
Divanem moves into the soil where nematodes are most active, providing enhanced drought tolerance compared to untreated turf. Nematode-damaged roots not only absorb less water but are also more susceptible to disease. When combined with Heritage Maxx fungicide, Divanem can further improve turf quality, density and quality, while providing enhanced biotic and abiotic stress tolerance.

For additional information and trial data, please visit www.greencast.ae

ABA 0.0 gai/ha ABA 9.4 gai/ha ABA 18.8 gai/ha ABA 37.5 gai/ha ABA 75.0 gai/ha

Quicker Recovery from Stress
Divanem protects roots from nematode damage so root system quality and mass can increase drastically. Deeper, more dense roots allow for healthier, stronger turf that maintains the highest quality above and below ground, allowing quicker recovery from stress, including aerification.

Enhanced Drought Tolerance
Divanem moves into the soil where nematodes are most active, providing enhanced drought tolerance compared to untreated turf. Nematode-damaged roots not only absorb less water but are also more susceptible to disease. When combined with Heritage Maxx fungicide, Divanem can further improve turf quality, density and quality, while providing enhanced biotic and abiotic stress tolerance.

For additional information and trial data, please visit www.greencast.ae
THE WORLD’S LEADING PLANT GROWTH REGULATORS. THE DRIVING FORCE FOR IMPROVED PLAYABILITY, QUALITY AND CONSISTENCY IN TURF AND ENHANCING THE APPEARANCE OF ORNAMENTAL SHRUBS.
Primo Maxx is a highly effective turf growth regulator. It works by blocking the production of gibberellic acid within the plant, which effectively limits cell elongation and vertical growth. The effect is to shorten the distance between the shoot nodes, resulting in a more compact growth habit. Whilst vertical growth is slowed, energy in the plant is diverted to boost both root and lateral foliar growth – creating, stronger, healthier, denser and more consistent turf, which requires less mowing.

Furthermore, Primo Maxx programmes will enhance turf quality and season-long playability of all turf surfaces.

**Mowing reduction**

Primo Maxx will usually slow vertical grass growth within three to five days of initial application. With slower leaf growth, playing surface speed and quality will remain consistent for longer, enabling the frequency of mowing to be reduced, by allowing mowing and rolling to be alternated on a day to day basis, for example. Mowing is faster where there are fewer clippings to box off or, where mulching mowers are used.

On fairways and first-cut rough or sports playing surfaces, turf mowing intervals may be extended as the cumulative benefits of the Primo Maxx programme take full effect:

- **Up to 50% less mowing over the season**
- **Significant increase in mowing speed**
- **Reduced costs and wear and tear on equipment**
- **Reduced volume of clippings for composting or disposal**

Slower grass growth will provide greater flexibility in cutting intervals, aide the use of mulching mowers and mitigate the effects of disruptions to the cutting schedule. Primo Maxx treated turf also retains visually appealing cutting patterns for longer.

**Coping with stress**

Research trials and turf managers’ experience on golf courses and sport pitches globally have consistently demonstrated the ability of a Primo Maxx programme to help turf withstand the effects of stress more effectively, and to recover faster.

Under drought conditions Primo Maxx has been shown to increase leaf chlorophyll content by up to 65%, maintaining visual appearance and playing quality for longer.

Research has shown that Primo Maxx applications increase the level of bioactive cytokinins within the plant – improving the tolerance of turf to heat and drought induced stress.

*Source – Rutgers University, USA*

**More efficient use of water**

Research at Rutgers University, USA, has shown that Primo Maxx improves the turf plant’s water use efficiency by reducing respiration rates and stomatal evapotranspiration. In trials under drought conditions, Primo Maxx enhanced the photochemical efficiency of turf by over 75%, compared to untreated turf. The relative water content of the grass leaves remained a healthy 20% higher than untreated 23 days after treatment.

Healthier plants, with deeper rooting, are also better able to seek out available soil moisture and nutrients, as well as recovering faster from drought effects or traffic and wear stress from heavy play.

**Nutrient input and tank mixing**

Maintaining adequate nutrition for healthy turf growth is essential to get the best results from Primo Maxx. In most situations a tank mix with an appropriate good quality liquid fertiliser is recommended with each application.

Primo Maxx is compatible with all Syngenta turf fungicides and most liquid fertilisers and nutrients. For all other tank mixes consult your technical advisor prior to application.

**Overseeding and reseeding**

An application of Primo Maxx can enhance the establishment of cool-season turfgrasses. Regulating growth of the existing stand before overseeding will reduce its competitiveness and allow the rapid establishment of newly germinated seedlings.

Application of Primo Maxx, along with cultural practices that help ensure new seedling vigor and growth, will also result in fewer clippings and less maintenance traffic on new seedings.

Primo Maxx is foliar absorbed, with no affect on seed germination or seedling growth.

Apply Primo Maxx one to five days before seeding, prior to verticutting, spiking, or other operations as part of the overseeding renovations.

Primo Maxx applications on reseeded turf will enhance rooting, establishment of young plants and encourage a dense growth habit. The Primo Maxx programme can commence when the new seedings reach 80–90% ground cover or the second leaf stage, with the initial application at 0.4 l/ha, before increasing to full required rates with subsequent applications.

The world’s leading plant growth regulator (PGR) for turf

Primo Maxx is the world’s leading plant growth regulator (PGR) for turf. It is highly effective at reducing the distance between the shoot nodes, resulting in a more compact growth habit. Primo Maxx programmes will enhance turf quality and season-long playability of all turf surfaces.

**The Maxx formulation advantage**

The unique Syngenta Maxx formulation has been specifically designed for turf applications. The advantages of the Maxx formulation include:

- **Outstanding turf safety**
- **Increased and enhanced product uptake**
- **Very stable in the sprayer tank**
- **An easy to use liquid formulation**
- **Compatible and easily mixable with other products**

**Manufactured exclusively by Syngenta, the precision manufactured sub-micron particles of active ingredient in the Maxx formulation ensure fast uptake and quick effects.**

*The fine particle formulation is very turf-safe and causes minimal stress to the plant as the active gets into the leaf and starts to work.*
Primo Maxx for golf
Primo Maxx is approved for use on all areas of golf courses. Its use will enhance turf quality and reduce management costs.

Benefits of Primo Maxx programmes include:
- Higher quality playing surface
- More consistent ball roll throughout the day
- Better wear tolerance
- Faster cutting and less clogging to box off
- Improved sward condition in shade
- Healthier turf = improved stress tolerance

Greens & Tees
- Higher quality playing surface
- More consistent ball roll throughout the day
- Better wear tolerance
- Faster cutting and less clogging to box off
- Improved sward condition in shade
- Healthier turf = improved stress tolerance
- Reduced mowing frequency
- Lower maintenance costs
- Superior ball lie
- Better drought resistance
- Quicker recovery from stress
- Improved wear tolerance
- Reduced risk of scalping when mowing
- Cut costs and carbon footprint of turf management

Application Rates
Primo Maxx application rates should be tailored to turf growing conditions and grass species present. During periods of intense growth, Primo Maxx rates should be increased up to the maximum permitted rate for specific grass species, in order to optimize growth regulator performance. Application rates may be lower when conditions are less favourable to turf growth.

Cutting height
In practice, managers of fine turf surfaces, have found the dense sward of Primo Maxx treated turf enables cutting height to be raised by 1 mm, whilst retaining equally fast, and more consistent ball roll. Raising the cutting height will reduce stress on plants and can help to contribute to a healthier sward. Experience has shown this can mitigate the effects of some stress induced diseases, such as Anthracnose, and play a significant role in Integrated Turf Management programmes.

Cut golf course costs and carbon emissions
Calculations by international researchers at Cranfield University in the UK have shown Primo Maxx programmes could effectively halve the carbon footprint on a typical 18-hole golf course, potentially reducing emissions from 3570 kg per year to 1862 kg. Along with the improvements in turf quality and playing surface consistency, the report calculates the cost of maintenance would be cut from an average of over US$65,000 to less than US$48,000 - a saving of around 15% per year.

Primo Maxx for football and rugby pitches
Primo Maxx is approved for use on sports pitches including soccer and rugby stadium pitches and training grounds. Its use will enhance turf quality and reduce management costs.

Benefits of Primo Maxx programmes include:
- Higher quality playing surface
- More successful overseeding and renovation
- Less clogging to box off
- Lower maintenance costs
- Healthier turf = improved stress tolerance
- Cut costs and carbon footprint of turf management
- Better shade tolerance

Field marking retained
Trials have shown that the inclusion of Primo Maxx to suppress turf growth will retain the durability and viability of the markings for longer. Line marking in conjunction with Primo Maxx has been shown to reduce the requirement for line marking paint over the course of the season, providing significant cost and time savings for clubs at all levels.

Furthermore, Primo Maxx retains healthy grass cover beneath the line marking paint, thus avoiding the need for reseeding at the end of the season and minimising weed ingress into the sward typically experienced when turf is killed with herbicide applications during line marking.

Pitch renovation
Trials and the experience of groundsman has shown Primo Maxx can significantly improve results of overseeding programmes within pitch renovation, by reducing competition from existing turf and encouraging establishment of deeper rooted seedings. The result is to get pitches back in play faster and in better condition for the playing season.

Concert preparation
Primo Maxx has been successfully used, at sports grounds around the world as part of a programme to strengthen turf and aid recovery in stadiums used for the staging of concerts. Applying Primo Maxx prior to the pitch being covered helps grass plants to survive being covered for up to ten days, and to recover faster when the covers are lifted.

Line marking technique
- 1.6–2.4 l/ha (22–33 fl. oz/acre)
- 0.8 l/ha
- 0.5 l/ha
- 0.3 l/ha

Line marking frequency
- 10mm – 18mm
- Every 2 weeks

A tank mix of Primo Maxx with an appropriate good quality liquid fertiliser is recommended in most situations. The first application should be at half rate and commence BEFORE stress occurs.

Refer to the registered label for full details and instructions for use.
Enhancing the appearance of ornamental shrubs

How does Bonzi work?

1. Growth between the nodes is shortened in treated plants with slower growth of lateral shoots and shorter leaves.

2. Bonzi temporarily blocks the plants production of the growth hormone gibberellic acid. This reduces the rate of vertical and lateral growth and results in a compact and dense canopy.

Bonzi – Growth regulation of shrubs with added health benefits

Bonzi contains the active ingredient paclobutrazol. Paclobutrazol is a systemic growth regulator which acts by reducing gibberellic acid production – the plant hormone responsible for cell elongation (upward growth). Shrub vigor is therefore controlled by reducing internodal lengths of new shoots and earlier formation of terminal buds.

The application of Bonzi also increases the production of chlorophyll and the plant hormone abscisic acid. Both are beneficial for tree growth and health – increased chlorophyll results in increased photosynthetic efficiency while elevated level of abscisic acid helps improve water use efficiency.

Bonzi – Early gibberellic acid blocker

Hedges – Pruning frequency cut by 40%

<table>
<thead>
<tr>
<th>Time (months)</th>
<th>Conventional cutting regime</th>
<th>Bonzi programmeme</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Cut</td>
<td>Cut</td>
</tr>
<tr>
<td>3</td>
<td>Cut</td>
<td>Cut</td>
</tr>
<tr>
<td>6</td>
<td>Cut</td>
<td>Cut</td>
</tr>
<tr>
<td>9</td>
<td>Cut</td>
<td>Cut</td>
</tr>
<tr>
<td>10</td>
<td>Cut</td>
<td>Cut</td>
</tr>
<tr>
<td>Total number of cuts</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>
Enhancing the appearance of ornamental shrubs

Bonzi – Easy to apply
Growth regulation of Bougainvillea with Bonzi

Water shoots observed 30DAA

Control – Water shoots observed

<table>
<thead>
<tr>
<th>Rate ppm</th>
<th>Spray Tank Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - 200 ppm</td>
<td>26 - 52 ml in 1 l</td>
</tr>
</tbody>
</table>

Refer to the registered label for full details and instructions for use

Bonzi key benefits
• Reducing pruning frequency of ornamental shrubs
• Enhances the appearance of ornamental shrubs
• Increases the chlorophyll content of leaves – greener colour
• Improves disease and drought tolerance

Bonzi

<table>
<thead>
<tr>
<th>Rate of application</th>
<th>100–200 ppm for foliar application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pack size</td>
<td>1 l</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Paclobutrazole</td>
</tr>
<tr>
<td>Rates of AI</td>
<td>4000 ppm</td>
</tr>
<tr>
<td>Target weeds</td>
<td>Ornamental shrubs</td>
</tr>
<tr>
<td>Activity</td>
<td>Foliar and Root Uptake</td>
</tr>
<tr>
<td>Activity</td>
<td>Systemic, Contact</td>
</tr>
<tr>
<td>Application technique</td>
<td>Knapsack sprayer</td>
</tr>
</tbody>
</table>

Water shoots observed 30DAA

Treated

30 DAA

Water shoots observed 30DAA

Treated

60 DAA
DEEPER THINKING. INNOVATIVE WETTING AND WATER CONSERVATION TECHNOLOGY THAT MOVES WATER FROM THE SURFACE AND HOLDS IT DEEPER AND MORE EVENLY IN THE ROOT ZONE.
Deeper Thinking
Qualibra is an exciting new concept in wetting agent technology. With Qualibra, water quickly moves away from the surface, and then is held more evenly and to greater depth within the root zone for better utilisation by turf plants.

Qualibra helps today’s turf managers to:
• Maintain plant health and playing surface quality
• Prevent damaging dry patch developing
• Make better use of irrigation resources
• 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 holds moisture deeper and more effectively

Qualibra rooting for quality
Qualibra has been shown to encourage:
• Greater root mass
• Deeper roots
• 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

Current classes of wetting agents

Combining strengths – delivering the best performance of both

Move surface water down:
• Keep the surface firm
• Maintain putting speed
• Achieve a clean cut
• Reduce conditions conducive to disease

Retain soil moisture at depth:
• Increase water availability
• Lower plant stress
• Optimise irrigation
• Increase root mass and depth
• Minimise effects of Dry Patch

Key:
- Polymer Wetter molecule
- Water
- Hydrophobic organic coating
- Soil particle

Application advice:
• Commence applications preventatively from March
• Best performance comes from applications at 2 to 4 week intervals

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 turf managers 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

European Institute of Turfgrass Science (EITS), 2011

Qualibra enhanced root development

Turf plants with stronger rooting systems are best placed to take most advantage of the better retention of soil moisture in the root zone.

Application volume
600 – 1000 l/ha

Irrigation after application
2 – 3 mm
GET XC - GET EVEN! SYNGENTA XC NOZZLES ARE A BREAKTHROUGH IN TURF APPLICATION TECHNOLOGY. BETTER RESULTS FOR IMPROVED TURF QUALITY = GREATER PLAYER SATISFACTION.
Innovative application technology for more accurate results

Syngenta XC Turf Nozzles have been exclusively designed and engineered to counter difficult issues with spraying golf courses and amenity turf – ensuring eXtra Coverage of turf surfaces and improving results of all applications.

### Current issues

<table>
<thead>
<tr>
<th>Current issues</th>
<th>The XC solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slopes and undulations cause uneven spray distribution</td>
<td>An entirely new engineered solution, with a unique orifice, droplet distribution pattern and wide spray angle – assuring uniform coverage even at nozzle heights as low as 30cm above the ground</td>
</tr>
<tr>
<td>Wind causing spray drift</td>
<td>Utilising new air induction technology, the XC Nozzle spray pattern can significantly reduce risk of spray drift and create more available spray days</td>
</tr>
<tr>
<td>Large droplets give uneven leaf coverage</td>
<td>The XC Nozzle creates significantly more droplets per ml than most other air induction or low drift nozzle designs, to enhance leaf coverage</td>
</tr>
<tr>
<td>Uneven spray distribution on the leaf</td>
<td>The XC Nozzle design has carefully calculated rearwards facing spray pattern, to deliver all-round coverage on the turf leaf</td>
</tr>
<tr>
<td>Low sprayer work rates</td>
<td>The XC Nozzle range is specifically designed to enable application at lower water volumes – increasing sprayer work rates and the potential to enhance product efficacy</td>
</tr>
</tbody>
</table>

### Reduce Drift

**Conventional flat fan nozzle**

- Up to 14% of spray volume is in driftable droplet size

**Syngenta Turf XC Nozzle**

- Maintains an even spray
- Combats spray drift allowing more spray
- Backwards spray angle enhances coverage even at low water volumes

Syngenta XC Nozzles use innovative air induction technology – incorporating a cushion of air in every droplet – to reduce risk of drift and improve spray retention on the leaf.

- More droplets per ml than other drift reducing nozzles
- More consistent droplet size
- Less run off when droplet hit the target

Syngenta XC Nozzles produce less than 3% drift susceptible fine droplets, compared to up to 14% dirty droplets from conventional nozzles.

- More product hits the intended target

#### Get Even

In patternation tests, conventional nozzles created up to 25% variability in spray distribution between every nozzle when operating at 30cm. The XC Nozzles have delivered less than 3% variability across the full spray boom width.

**Conventional flat fan nozzle**

- Up to 25% variability with conventional nozzles
- Less than 3% variability with XC Nozzles

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

**The right product, IN THE RIGHT PLACE, at the right time = Better results for improved turf quality = Greater player satisfaction.**

### Syngenta Turf XC Nozzle range availability

<table>
<thead>
<tr>
<th>Size</th>
<th>Typical water volume (l/ha)</th>
<th>Typical spraying speed (Km/hr)</th>
<th>Recommended use</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>025</td>
<td>220-400</td>
<td>3-5</td>
<td>Foliar fungicides; herbicide and growth regulator</td>
<td>Maintains an even spray</td>
</tr>
<tr>
<td>04</td>
<td>220-400</td>
<td>5-7</td>
<td></td>
<td>Combats spray drift allowing more spray</td>
</tr>
<tr>
<td>08</td>
<td>450-1000</td>
<td>5-7</td>
<td>Fungicides targeted at soil application and wetting agents</td>
<td>Backwards spray angle enhances coverage even at low water volumes</td>
</tr>
</tbody>
</table>
MAKING LIGHT WORK. SYNGENTA’S NEW TURF PIGMENT PROVIDES AN INCREDIBLE VISUAL EFFECT WITH A SHADE AND INTENSITY YOU CAN MANAGE. CONSISTENT COLOUR PLUS PROTECTION FROM HARMFUL UV RAYS AND EXCESSIVE LIGHT.
**Making light work**

**Introduction to Ryder Turf Pigment**

Ryder provides an incredible visual effect – producing a deep, desirable green colour – with a shade and intensity you can manage to suit your course and conditions.

And, at the same time, Ryder enables you to manage light - to make it work more efficiently for your turf plants.

Not all energy emitted by the sun is useful for turfgrass growth. In fact, some of this energy can be actually harmful to the plant – effectively causing damaging sunburn to plant cells.

Ryder is a highly concentrated and stable green pigment designed for use on managed turf to improve its appearance and to help protect against UV radiation and high light intensities.

**How does Ryder work?**

Plants produce natural compounds to reflect, scatter and screen from radiation damage, including carotenoids, anthocyanins, flavonoids, and cuticle waxes.

Using the latest generation of pigment technology, at a high 70% concentration, Ryder can effectively mimic plant pigments and deliver protection against harmful UV radiation and high light intensities.

The intensity of colour can be selected through adjustments to application rate, frequency and integrated fertiliser programmes.

### Benefits on warm season turf

- Pigment application can increase canopy temperature and delay dormancy
- Compared to untreated plots, some pigments have been shown to be 10°C warmer
- Less need to overseeding and transitioning
- Aids in recovery from dormancy in the spring and recovery
- Improved turf quality and density

### Ryder helps protect against harmful UV light and excessive light

Ryder helps protect against harmful UV light and excessive light.

**Ryder Programme timing**

Ryder would typically be applied prior to a predicted period of stress but can be applied throughout the year if required used in combination with Primo Maxx II.

- Over the summer, Ryder will help provide protection against high light intensities and UV light and stay looking green where desired.
- Ryder will help delay dormancy, provide winter colour and speed spring recovery.

**Natural defence**

Plants naturally produce more defensive mechanisms in the face of high light intensity. Purpling of leaves can be caused by enhanced anthocyanin production. Anthocyanin is a natural turf pigment.

**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.

**Winter Programme - warm season**

Use Ryder 1.0&1ha

Winter Programme - warm season

Use Ryder 1.0 → 1.0 ha Spray two directions

<table>
<thead>
<tr>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
</table>

**Reflects/absorbs UV-light**
Making light work

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.

For even coverage always apply using Syngenta XC Nozzles, operated at 5.0 cm nozzle tip height and at a water volume of 250 – 500 litres/ha.

Two sprays at half rate, applied in different directions, can achieve better coverage on turf leaves managed at higher heights of cut.

Application rates

- Apply in a programme before stress / dormancy begins between 0.75–2.0 l/ha
- Ensure good coverage is achieved
- XC 04 Foliar nozzles
- 400-500 l/ha
- Spraying in two directions will improve coverage
- Mow prior to application
- Use higher rates:
  - for higher high of cuts
  - for deeper colour

“...I used the new Syngenta turf pigment Ryder on the Albatros course and was really impressed. Great name but even better result!”

Alejandro Reyes
Golf Courses and Real Estate Manager at Le Golf National, Paris, France

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.