



 **PrimoMaxx**[®]
Plant growth regulator

syngenta[®]

What is Primo Maxx®?

Primo Maxx® is a highly effective turf growth regulator. It works by blocking the production of gibberellic acid within the plant leaf, which effectively limits cell elongation and vertical growth. The result is to shorten the distance between the shoot nodes, leading to more compact growth.

Whilst the vertical growth is slowed, energy in the plant is diverted to boost both root and lateral growth—creating more consistent stronger, healthier and denser turf which requires less mowing.

Coping with stress

UK cool season grass species struggle to cope when temperatures rise and soil water reserves fall. Studies have shown that temperatures above 18°C inhibit root growth and, above 24°C, reduce photosynthetic rates and decrease the chlorophyll content of cool season turf grasses, such as Bents, Fescues, Ryegrasses and *Poa annua**. The net result is loss of colour, turf density and turf quality.

Remember, on a sunny day, the temperature within the turf grass canopy is often 7–10°C warmer than ambient air temperature, adding to turf stress.

Research trials and turf managers' experience on UK golf courses and sport pitches has consistently demonstrated the ability of a **Primo Maxx** programme to help turf withstand

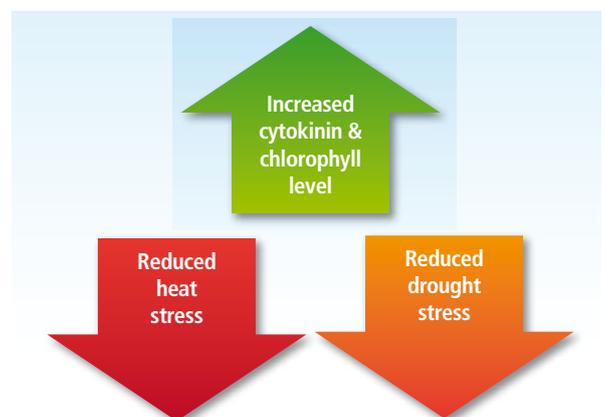
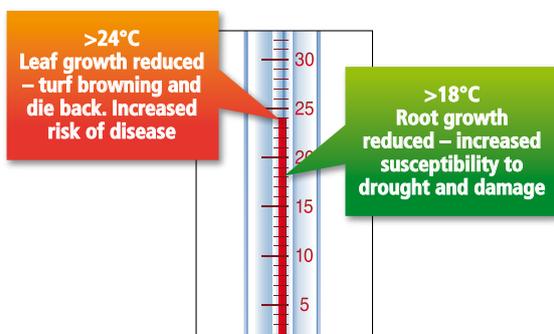
the effects of stress more effectively, and to recover faster.

Under drought conditions Primo Maxx has been shown to increase leaf chlorophyll content by 60%*.

The presence of cytokinins in the plant has been shown to improve turf quality by delaying the degradation of chlorophyll caused by high temperatures and to alleviate leaf browning. Research has shown that **Primo Maxx** applications increase the level of bioactive cytokinins within the plant—improving tolerance to heat and drought induced stress.

With a warming climate becoming a reality, turf managers are going to have to cope with increasingly stressful conditions. Staying cool and green when all around are burning up will make a real difference.

*Source – Rutgers University, USA



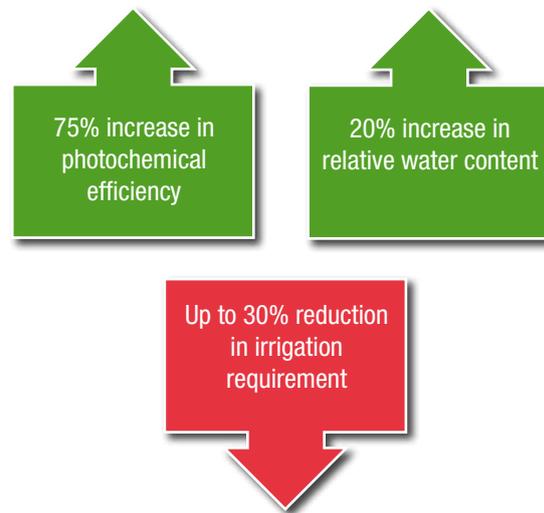
Make more efficient use of water

Research at Rutgers University has shown that only 3% of water taken up by turf grass is used in photosynthesis, with over 90% transpired by the plant. **Primo Maxx** has been shown to improve the turf plant's water management 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 28 days after treatment.

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

Turf managers' experience reports that a Primo Maxx programme can reduce irrigation requirements by up to 30%, whilst keeping turf greener and healthier for longer.



Application and timing

The **Primo Maxx** programme can be started at any stage of the growing season, but should ideally start at the onset of spring growth and continue whilst grass is actively growing.

Primo Maxx application rates should be tailored to specific seasonal growing and weather conditions. **Primo Maxx** applications can start as soon as consistent grass growth commences—typically from mid-April to mid-May onwards, when air and soil temperatures are consistently 8–10°C or above for an extended period of time (e.g. more than five consecutive days).

Primo Maxx programmes will give the best results in preventing the effects of drought if a series of treatments are made before grass comes under stress (Pre-Stress Conditioning). This will maintain healthy grass for longer and aid rapid recovery.

If grass growth stops during extended dry periods, **Primo Maxx** application intervals may be extended until moisture and active growth returns. Do not apply **Primo Maxx** to stressed turf.

To help time **Primo Maxx** applications visit the website www.greencast.co.uk for information on current soil temperatures and weather conditions.

www.greencast.co.uk / www.greencast.ie

NEW LABEL APPROVAL

Primo Maxx now has label approval as being rainfast within 1 hour of application.

Nutrient input and tank mixing

Maintaining adequate nutrition in the root zone 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.

Grass species

Primo Maxx is specific to turf management and has beneficial effects on all grass species typically sown on UK sports surfaces. Application rates for fast growing Perennial Ryegrass are higher than fine Bent, Fescue and *Poa*

species. Long term studies using repeated **Primo Maxx** programmes have consistently shown no adverse effects on fine turf sward composition and improvements in playing surface quality.

Over seeding and reseedling

NEW LABEL APPROVAL

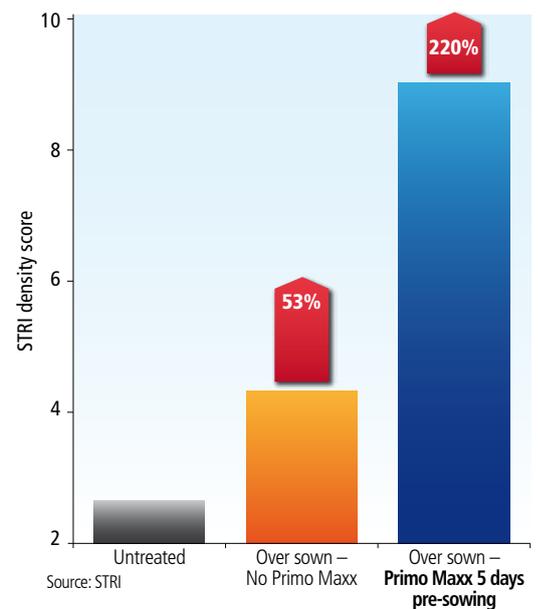
Primo Maxx now has full label approval for use within over seeding and reseedling programmes. See advice details below and in specific sports sections for full details.

STRI trials have shown that **Primo Maxx** can improve the success of over seeding and turf reseedling. Regulating growth of the existing sward during over seeding will reduce the competitiveness and allow the rapid establishment of newly germinated seedlings. **Primo Maxx** has no detrimental

effects on seed germination. Full **Primo Maxx** programmes can recommence when new seedlings reach the two true leaf stage to encourage rooting and dense growth, typically five to six weeks after sowing.

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

For more information see the over seeding advice on www.greencast.co.uk



STRI trials have shown Primo Maxx application prior to over seeding leads to significantly faster and more successful establishment, with better recovery of turf quality.

Grass cutting

Primo Maxx will slow vertical grass growth within one to two weeks of initial application. Continue to mow fine turf surfaces as normal, benefitting from faster mowing with fewer clippings to box off. With slower leaf growth playing surface speed and quality will remain consistent for longer, potentially enabling the frequency of mowing to be reduced or optimising performance greens maintenance schedules alternating mowing and rolling.

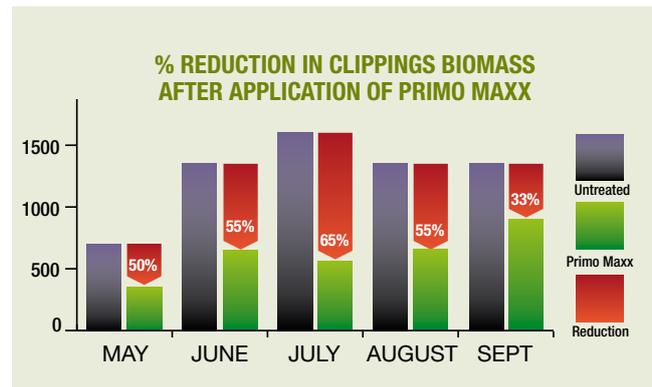
On other areas of the course or sports playing surfaces, turf mowing intervals may be extended as the cumulative benefits of the **Primo Maxx** programme take full effect.

The first noticeable difference will be far fewer clippings to remove—up to 50% less over the season. This will significantly increase mowing speed and reduce costs and wear and tear on equipment, as well as reducing the volume of clippings for composting or disposal.

The slower grass growth will provide greater flexibility in

cutting intervals and mitigate the effects of rain disrupting the cutting schedule. Slower vertical grass growth will also retain visually appealing cutting patterns for longer.

For more information see the fairway management technical update on www.greencast.co.uk



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. Typically over 1,000 **Primo Maxx** micelles would fit across the leaf opening of a single turf stomata.

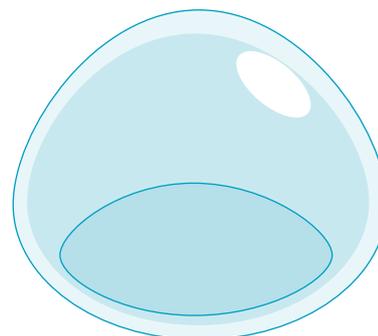
The fine particle formulation is very turf-safe and causes minimal stress to the plant as the active gets into the leaf and starts to work.

The Maxx brand is only available in Syngenta turf products.

Other products in the Maxx family include the fast acting fungicide, **Banner Maxx**, and Syngenta's new fungicide, **Heritage Maxx**.

Maxx formulation

If this represents a droplet of standard formulation...



Primo Maxx

Note: Drawn to scale

...this is a micelle of **Primo Maxx** upon dilution

Environmental Profile

A new label registration for Primo Maxx for the 2010 season confirmed it has:

- ✓ PASSED risk assessments on birds or mammals
- ✓ PASSED risk assessments on beneficial insects
- ✓ PASSED risk assessments on soil organisms
- ✓ PASSED risk assessments on aquatic species

The environmental profile means **Primo Maxx** is suitable for

use within Integrated Turf Management (ITM) Programmes for:

- Production of more consistent, higher quality playing surfaces
- Promotion of healthier turf
- Potential to significantly reduce the carbon footprint of turf management
- Enhanced water use efficiency

Primo Maxx for golf



Primo Maxx is approved for use on all areas of golf turf, including greens, tees, fairways and roughs. Its use will enhance turf quality and reduce management costs.

Benefits of Primo Maxx programmes include:

Greens & Tees

- Higher quality playing surface
- More consistent ball roll all day
- Better wear tolerance
- Faster cutting and less clippings to box off
- Improved sward condition in shade
- Less stress = Healthier turf

Fairways

- Reduced mowing frequency
- Lower maintenance costs
- Superior ball lie
- Better drought resistance
- Quicker recovery from stress
- Improved wear tolerance
- Cut costs and carbon footprint of sports turf management

Application rates

For tees, fairways and rough areas of the golf course, the first application in the **Primo Maxx** programme should be at half rate (usually 0.8 l/ha), before use of higher application rates during periods of intense growth.

As temperatures fall in the autumn and turf growth slows,

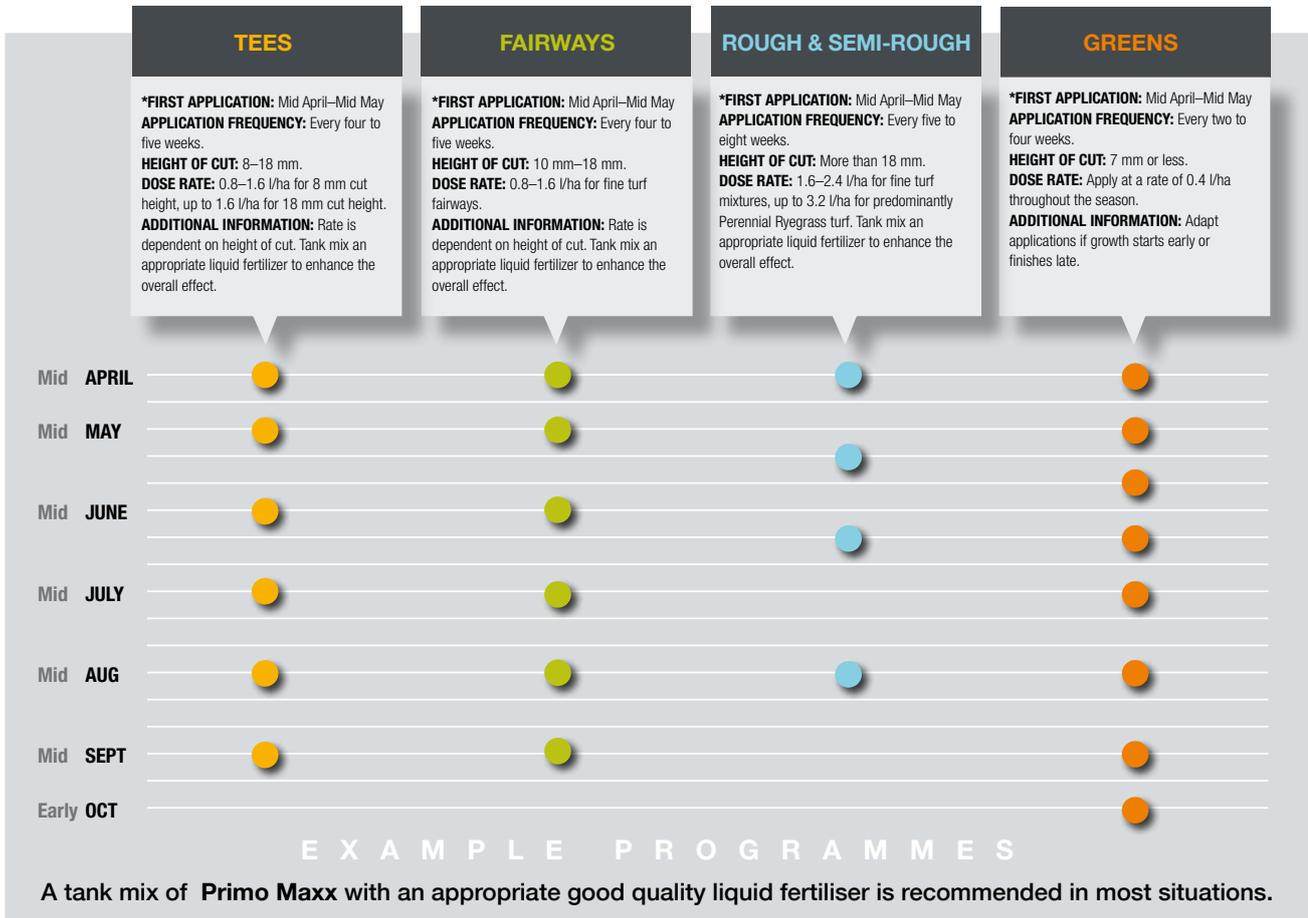
make the final **Primo Maxx** application of the season at half rate (typically 0.8 l/ha). On fine turf surfaces, more frequent applications at the lower rate of 0.4 l/ha may be maintained throughout the season whilst conditions are conducive to growth.

Cutting height

Where turf is cut at a lower height—down to 3mm or less on greens—trials have shown that **Primo Maxx** applications should be made at a lower rate, but applied more frequently—typically 0.2–0.4 l/ha applied every two to four weeks according to turf growth. Overall, total application rate through the course of the season will remain broadly the same.

In practice, managers of fine turf surfaces, have found the denser sward of **Primo Maxx** treated turf enables cutting height to be raised by 1mm to 2mm, whilst retaining equally fast and more consistent ball roll. Raising the cutting height by up to 33% significantly reduces the stress on plants and can help to contribute to a healthier sward.

The Primo Maxx programme for golf courses

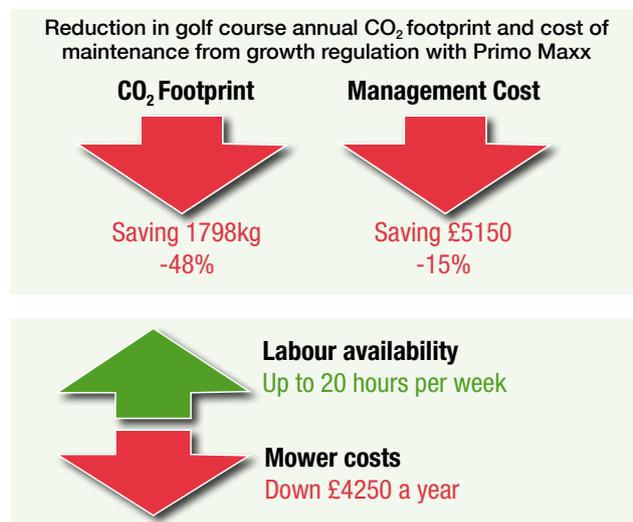


Cut golf course costs and carbon emissions

Calculations by Cranfield University have shown **Primo Maxx** programmes can effectively halve the carbon footprint on a typical 18-hole golf course, reducing emissions from 3570kg per year to 1862kg. At the same time, the cost of maintenance would be cut from an average £37,000, to £31,700—a saving of around 15% per year.

With the cost of running a fairway mower calculated at over £10 an hour, reducing fairway mowing with a **Primo Maxx** programme could save over £4250 a year in lower fuel, maintenance and repair bills—along with reducing the time spent mowing by up to 20 hours per week.

Visit the Environment section on www.greencast.co.uk for more information.



Primo Maxx

for winter sports pitches



Primo Maxx is approved for use on all sports pitches including football 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
- Better wear resistance
- Reduced frequency of mowing
- Faster cutting
- More successful over seeding and renovation
- Less clippings to box off
- Lower maintenance costs
- Less stress = Healthier turf
- Cut costs and carbon footprint of sports turf management

The Primo Maxx programme for winter sports pitches

Mid-late April	May	June	July	Aug-Sept	October
0.8 l/ha	0.8–1.2 l/ha	0.8–1.6 l/ha	0.8–1.6 l/ha	0.8–1.6 l/ha	0.8 l/ha
<p>Apply in a water volume of 300–1000 l/ha, using a medium spray quality. Lower water volume will increase work rates and thus improve timeliness of applications.</p> <p>A tank mix of Primo Maxx with an appropriate good quality liquid fertiliser is recommended in most situations.</p>					

Application programme rates and timing

Apply **Primo Maxx** every 4–6 weeks depending on growth and environmental conditions. Use a lower application rate (0.8 l/ha) for the first application, to condition turf at the start of the **Primo Maxx** programme. Further **Primo Maxx** application rates should be tailored to specific seasonal growing and weather conditions.

Higher rates will maintain turf in regulation for longer between extended applications; lower rates have a less dramatic effect on plants but will require more frequent

application. Overall application rate will remain broadly similar over the course of the season.

On heated sports turf pitches, Primo Maxx applications may be extended later in the season, with rates tailored according to seasonal conditions and turf growth.

As temperatures fall in the autumn and growth slows, make the season's final application of **Primo Maxx** at a lower rate of 0.8 l/ha.

New line marking recommendation

NEW LABEL APPROVAL

Primo Maxx is now approved for direct mixing with line marking paint when marking out sports pitches and playing surfaces.

The inclusion of **Primo Maxx** to suppress turf growth will retain line durability and visibility for longer. In practice, 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.

Primo Maxx should be incorporated at a rate of 2 ml per litre of line marker paint mix, using spray line markers or conventional wheel systems.

Primo Maxx renovation programme

STRI trials and groundsmen's own experience has shown **Primo Maxx** can significantly improve results with pitch renovation and over seeding programmes, to reduce competition from existing turf and encourage stronger establishment of deeper rooted seedlings, to get pitches

back in play faster and in better condition for the winter season. The following Programme is typical for stadium and training ground pitch renovation, but should be tailored according to the actual time of planned seed establishment.

Timing	Pre-Renovation	Seedling establishment	Grow in	Turf development	Final application
	April	June	July	Aug-Sept	Oct*
Guideline rates	0.8 l/ha	0.8 l/ha	0.8-1.2 l/ha	0.8-1.6 l/ha	0.8 l/ha

* On heated sports turf pitches **Primo Maxx** applications may be extended, with rates tailored according to seasonal conditions and turf growth.
 A tank mix of **Primo Maxx** with an appropriate good quality liquid fertiliser is recommended in most situations.

Concert preparation

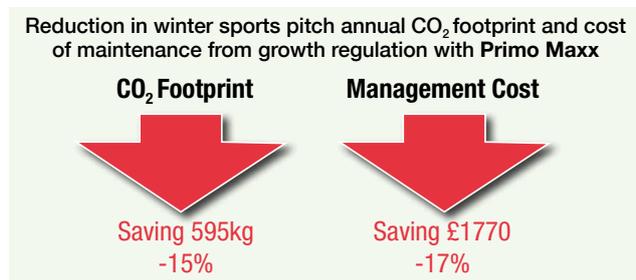
Primo Maxx has been successfully used, at sports grounds around the UK, as part of a programme to strengthen turf and aid recovery in stadiums used for the staging of concerts. Applying **Primo Maxx** prior to the pitch covering being laid helps the grass plant to survive being covered for up to 10 days, and to recover faster from any signs of yellowing and etiolated growth when the covers are lifted.

Use the Primo Maxx programme for 8-12 weeks prior to the event to strengthen turf. The final application should be made 5-10 days prior to the flooring being laid and include a Heritage Maxx fungicide application, to give protection against fungal disease. The Primo Maxx programme should recommence 3-4 weeks after the flooring comes off, allowing the turf to recover and any over seeding renovation to become established.

Cutting costs and carbon emissions

Calculations by Cranfield University have shown that a **Primo Maxx** programme to reduce mowing frequency can cut the cost of professional winter sports turf management by over £1750 per pitch, along with a 45% reduction in the carbon footprint.

Visit the Environment pages of www.greencast.co.uk for more information.



Primo Maxx

for Bowls & other sports turf surfaces



Primo Maxx is approved for use on bowling greens and other sports turf surfaces, including cricket squares, croquet lawns and tennis courts. Its use will enhance turf quality and reduce management costs.

Benefits of Primo Maxx programmes include:

- Higher quality playing surface
- More consistent ball roll for bowls
- Even ball bounce on tennis courts
- Better wear tolerance
- Reduced frequency of mowing and faster cutting
- More successful over seeding and rejuvenation
- Less clippings to box off
- Lower maintenance costs
- Less stress = Healthier turf
- Cut costs and carbon footprint of sports turf management

The Primo Maxx programme for bowls and fine turf surfaces

Mid-April	May	June	July	August	September	Early October
0.4 l/ha	0.4 l/ha	0.4 l/ha	0.4 l/ha	0.4 l/ha	0.4 l/ha	0.4 l/ha
Apply Primo Maxx in a water volume of 300–1000 l/ha, using a medium spray quality. Lower water volume will increase work rates and thus improve timeliness of applications.						
A tank mix of Primo Maxx with an appropriate good quality liquid fertiliser is recommended in most situations.						

Application programme rates and timing

Primo Maxx applications can start as soon as consistent grass growth commences, typically between mid-April and mid-May onwards, when air and soil temperatures are consistently 8–10°C or above for an extended period of time (e.g. more than five consecutive days).

Most bowling greens and many fine turf surfaces are in urban areas where temperatures can typically be 3–5°C above surrounding rural areas. In some cities growing conditions may extend from early March to mid-November,

with the need for **Primo Maxx** applications to be tailored accordingly. Applications are recommended every three to four weeks during the growing season, at a standard rate of 0.4 l/ha, or 4 ml per 100m² (see guideline programme above).

Avoid applications during periods of drought stress. **Primo Maxx** application rates and timing should be tailored according to specific seasonal growing and weather conditions.

Primo Maxx small packs

Primo Maxx is available in an easy-to-use 500 ml pack specifically designed to be more affordable for bowling greens and other smaller sports turf surfaces.

Pack coverage = 1.25 Ha @ 0.4 l/ha.
Also available in 5-litre Syngenta S-pac.

Application advice



Syngenta Turf Foliar Nozzle

Application advice

New Syngenta Turf Foliar Nozzles can optimise **Primo Maxx** spray retention on the leaf are designed to operate at lower water volumes for higher work rates and, with significantly lower drift risk than conventional flat fan nozzles, increase available spraying opportunities. Alternatively apply in water volume of 300–500 l/ha using a flat fan nozzle.

Syngenta Turf Foliar Nozzles:

- Droplet spectrum designed to maximise spray retention on the leaf
- Optimum droplet size for leaf coverage
- Excellent drift reduction
- Designed to work at lower water volume, compared to conventional flat fan nozzles
- Typical water volume giving optimum results—200–250 l/ha
- Retains spray pattern characteristics at faster operating speeds





Primo Maxx is an exciting turf management tool that consistently helps to encourage stronger, healthier grass and produces better playing surfaces. Regulating turf growth with the easy-to-use Primo Maxx programme will ensure you get the maximum play on all sports surfaces, all year round.

Primo Maxx delivers:

- Better turf quality
- Healthier turf
- Consistent playing surface
- Reduced management costs
- Better wear tolerance
- Reduced carbon footprint
- More successful over seeding
- Great looking turf



Primo Maxx is available in the easy-to-use Syngenta S-pac.
Pack size: 5 litre. Application rate: 0.4-3.2 l/ha
Pack coverage: 1.56-12.5 ha. Water volume: 300-1000 l/ha
Also available in 500ml packs

Syngenta Crop Protection UK Ltd., Registered in England. No 849037, CPC4, Capital Park, Fulbourn, Cambridge, CB21 5XE
E-mail: customer.services@syngenta.com Web: www.greencast.co.uk / www.greencast.ie

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