



Fertilisation of Golf and Bowling Greens

Plant-strengthening nutrients

As mentioned earlier, the balance with autumn fertilisation is to provide small amounts of controllable nutrient to maintain sward density and plant health. All Headland granular formulations feature high-potassium to strengthen cell walls and make the plant more resistant to disease attacks. To compliment the range of granular fertilisers on offer, Headland also has a range of liquid fertilisers for the autumn / winter. These feature additional plant-strengthening nutrients in the form of liquid calcium, magnesium, potassium and iron and are featured overleaf.

<p>Multigreen Mini 12+0+44</p> <p>A single application, micro prilled controlled release fertiliser featuring temperature-only released nitrogen and potassium. 40% of the nitrogen and potassium is uncoated for immediate results. Sulphur-free formulation.</p> <p>Ideal for USGA specification greens</p>	<p>5-6 month longevity</p> 	<p>Granule size 1.0mm</p> <p>Suitable for cutting heights $\geq 4\text{mm}$</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>25g / m² - 10 bags / hectare</td></tr> <tr><td>Normal</td><td>33g / m² - 14 bags / hectare</td></tr> <tr><td>Heavy</td><td>44g / m² - 18 bags / hectare</td></tr> </table> <p>Application Period September - December</p>	Light	25g / m ² - 10 bags / hectare	Normal	33g / m ² - 14 bags / hectare	Heavy	44g / m ² - 18 bags / hectare
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Normal	33g / m ² - 14 bags / hectare								
Heavy	44g / m ² - 18 bags / hectare								
<p>Multi-K Miniprill 13+0+46</p> <p>A multi application, quick release fertiliser featuring sulphur-free nitrogen and potassium. Cost effective. Both Multi-K Miniprill 13+0+46 and Multigreen Mini 12+0+44 are ideal for use in anaerobic, 'black layer' rootzones.</p>	<p>Quick release fertiliser</p> 	<p>Granule size 1.0mm</p> <p>Suitable for cutting heights $\geq 4\text{mm}$</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>10g / m² - 4 bags / hectare</td></tr> <tr><td>Normal</td><td>15g / m² - 6 bags / hectare</td></tr> <tr><td>Heavy</td><td>20g / m² - 8 bags / hectare</td></tr> </table> <p>Application Period September - April</p>	Light	10g / m ² - 4 bags / hectare	Normal	15g / m ² - 6 bags / hectare	Heavy	20g / m ² - 8 bags / hectare
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Normal	15g / m ² - 6 bags / hectare								
Heavy	20g / m ² - 8 bags / hectare								
<p>Greentec 6+4+12+4Fe+2MgO</p> <p>A multi application, traditional quick release fertiliser featuring additional iron and magnesium. Derived from sulphate of ammonia for surface acidification and good low temperature response.</p>	<p>Quick release fertiliser</p> 	<p>Granule size 1.2mm</p> <p>Suitable for cutting heights $\geq 4\text{mm}$</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>25g / m² - 10 bags / hectare</td></tr> <tr><td>Normal</td><td>30g / m² - 12 bags / hectare</td></tr> <tr><td>Heavy</td><td>35g / m² - 14 bags / hectare</td></tr> </table> <p>Application Period September - April</p>	Light	25g / m ² - 10 bags / hectare	Normal	30g / m ² - 12 bags / hectare	Heavy	35g / m ² - 14 bags / hectare
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Heavy	35g / m ² - 14 bags / hectare								

Autumn renovation

Many golf clubs are now undertaking renovation during August and September and for good reason. At this time of year, the soil temperature is still high and recovery can be gained in a fraction of the time compared to if the same work was undertaken in October and November. The timing is also beneficial to the grass plant because the increased oxygen and decreased compaction allow it to develop new roots to survive the winter. Incorporating an organic fertiliser at coring is a now recognised practice and benefits the plant by stimulating root growth and encouraging soil bacteria and fungi to decompose organic matter.

<p>Greentec Organic 5+5+5+2MgO</p> <p>A single application, balanced organic fertiliser featuring quick and slow release nitrogen, phosphorus and potassium and magnesium. 50% of the nitrogen is derived from sulphate of ammonia for quick recovery.</p> <p>Ideal for incorporation during autumn coring</p>	<p>Organic fertiliser</p> 	<p>Granule size 1.2mm</p> <p>Suitable for cutting heights $\geq 6\text{mm}$</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>35g / m² - 14 bags / hectare</td></tr> <tr><td>Normal</td><td>40g / m² - 16 bags / hectare</td></tr> <tr><td>Heavy</td><td>50g / m² - 20 bags / hectare</td></tr> </table> <p>Application Period August - November</p>	Light	35g / m ² - 14 bags / hectare	Normal	40g / m ² - 16 bags / hectare	Heavy	50g / m ² - 20 bags / hectare
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Liquid Fertilisation of Golf and Bowling Greens

Liquid supplementary feeds

While the majority of autumn fertilisation undertaken is in granular form, there is a growing trend towards liquid fertiliser applications during this period of the year. The advantages with liquid applications are that they can provide small amounts of readily available nutrient and that different components can be tank-mixed to achieve an end result. Highlighted at the bottom of the page are some autumn / winter tank mix suggestions.

NEW Turfite

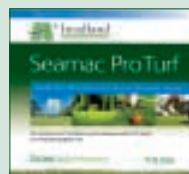
Turfite builds on the success of Liquid Turf Hardener by combining 8.0% calcium, 2.0% magnesium with 18.0% phosphite – a form of phosphorus known to stimulate the plants natural defense mechanism and thereby increase resistance to disease.
Ideal for tank-mixing.



Application Rates	
Light	20 litres / hectare
Normal	40 litres / hectare
Specific gravity = 1.3	
Application Period	Pack size
March - December	10L & 200L

Seamac Pro Turf

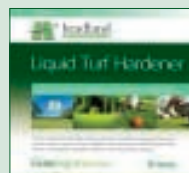
A liquid seaweed featuring 6% chelated iron, with 3.4% sulphur, 2% magnesium and 2.5% nitrogen. The addition of nitrogen ensures fast uptake into the plant, even at low soil temperatures, whilst only inputting 1kg of nitrogen per hectare.
Ideal for tank mixing



Application Rates	
Normal	20 litres / hectare
Heavy	40 litres / hectare
Specific gravity = 1.3	
Application Period	Pack size
All year round	10L & 200L

Liquid Turf Hardener

A liquid cocktail of 9.3% calcium and 1.8% magnesium to enhance cell wall strength and strengthen the plant. Contains nitrogen to facilitate rapid uptake.
Ideal for tank mixing



Application Rates	
Normal	20 litres / hectare
Heavy	40 litres / hectare
Specific gravity = 1.4	
Application Period	Pack size
All year round	10L & 200L

Vertex K 0+0+25

A high potassium liquid fertiliser to strengthen the grass plant. Tank-mix compatible with Seamac Pro Turf and Liquid Turf Hardener.



Application Rates	
Normal	20 litres / hectare
Heavy	40 litres / hectare
Specific gravity = 1.45	
Application Period	Pack size
September - April	10L & 200L

Tank-mix suggestions

where an autumn / winter base feed has been applied...

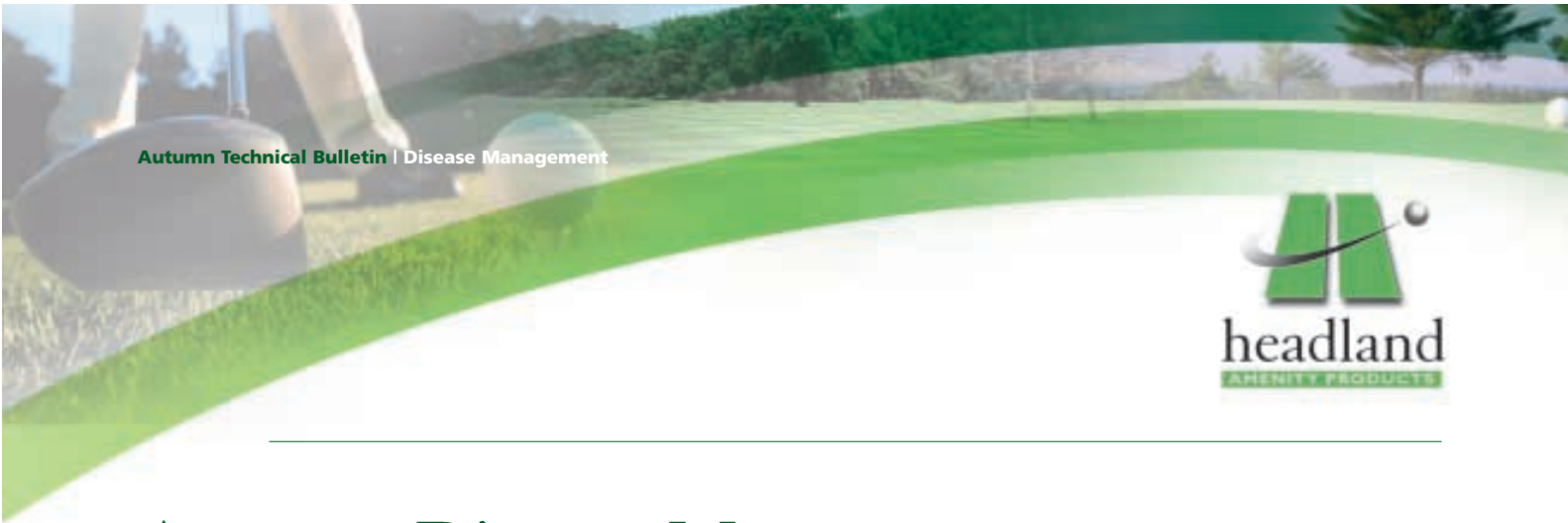
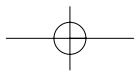
	+		or		=	with Liquid Turf Hardener	with Turfite
20litres		40litres		40litres		N - 6.2kg / ha	4.3kg / ha
						P - 0kg / ha	9.4kg / ha
						K - 0kg / ha	0kg / ha
						MgO - 2.2kg / ha	1.6kg / ha

where an autumn / winter base feed has not been applied...

	+		or		+	MULTI - K 13+0+46 water soluble	=	with Liquid Turf Hardener	with Turfite
20litres		20litres		40litres		25 kg		N - 6.7kg / ha	7.5kg / ha
								P - 0kg / ha	9.4kg / ha
								K - 11.5kg / ha	11.5kg / ha
								MgO - 1.4kg / ha	1.6kg / ha

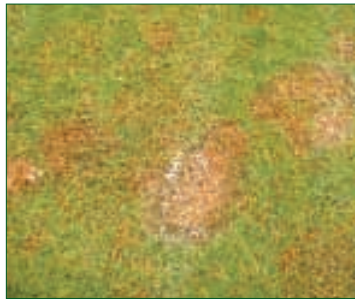
Headland Snare contains Thiophanate-methyl . MAPP no:11873 Snare is a registered trademark of Headland Amenity Ltd. Chipco Green is a registered trademark of Bayer CropScience Ltd

Headland Amenity Ltd 1010 Cambourne Business Park, Cambourne, Cambridgeshire CB3 6DP Tel 01223 597834 Fax 01223 598052 email info@headlandamenity.com



Autumn Disease Management

The main turf disease in the UK and Ireland during this period is Fusarium patch (*Microdochium nivale*), although both anthracnose and latterly take-all patch (On newly constructed greens) can both be active during the autumn period.



The change in weather patterns has played a big part over recent years in increasing the incidence of fungal diseases in the autumn, because this period has undergone the greatest change in terms of soil and air temperatures. From the

beginning of October, disease pressure increases dramatically and fungicide choice, application rate, frequency and timing becomes of paramount importance if greens are to be kept clean of disease scarring.

Of course, fungicide applications are not the only factor in determining the activity and severity of disease outbreaks, cultural techniques play a big part. The following are key in minimising disease outbreaks...

- **Ensure the plant has sufficient, but not excessive nutrition through the autumn period**

Too-little nutrient as well as too-much can lead to disease outbreaks

- **Maintain thatch levels at a maximum of 8-10mm**

High surface fibre increases plant stress during dry periods of weather and hold moisture during the autumn / winter allowing easier fungal movement from plant to plant.

- **Remove surface moisture by swishing and by using dew dispersal agents**

High levels of surface moisture encourage disease movement and spore dispersal.

- **Maintain plant vigour and hardiness by using plant-strengthening products**

Maintain high plant potassium levels and utilise plant-hardeners to increase cell wall thickness and decrease the ease with which fungi can enter the plant.

Systemic & Contact tank mixes – A combination approach

Historically most companies have sold single product solutions to control turf diseases year after year, which can increase the likelihood of resistance developing to that particular active ingredient and more importantly, may not provide reliable control during our changeable autumn weather patterns.

With the typical range of weather conditions we can experience in the autumn, single-product applications become more and more of a lottery. Soil temperatures remain higher for longer and growth and therefore cutting, carries on well into December. Under these conditions, with frequent clipping removal, the longevity of a contact fungicide can be severely reduced and disease scars soon become active again, requiring re-treatment. On the opposite side of the coin, we can also experience, sharp drops in soil and air temperature as was the case last October and under these circumstances, uptake of active ingredients from systemic fungicides can be too slow to provide control. Headland Amenity suggest using a combination of systemic fungicides, like Snare and contact fungicides in a tank mix to obtain optimum disease control

Headland Snare – Systemic fungicide

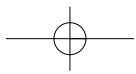
Headland Snare contains Thiophanate-methyl and is a broad-acting systemic fungicide for the control of red thread, fusarium patch and dollar spot and also provides suppression of casting worms.

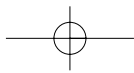
Research from the US has shown Thiophanate-methyl to provide preventative control of Anthracnose, when used in a regular program.

Tank mix options with Snare for the control of fusarium patch.		
Product	Rate per hectare	Spray volume per hectare
Headland Snare + Chipco Green	15 litres 14 litres	550-1100 litres 550-1100 litres
Headland Snare + 500gm/l Chlorothalonil containing products	20 litres 15 litres	550-1100 litres 550-1100 litres

Note for Guidance when using the above...

- Apply after mowing and avoid mowing for at least 24hrs after application and do not water until the spray has dried on the leaf.
- When using Chlorothalonil-containing products, always add Headland Snare to the spray tank first
- Apply at the first sign of disease activity



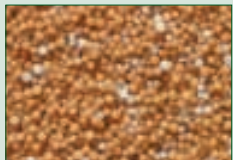




Fertilisation of Tees, Approaches, Surrounds and Fairways

About Multigreen controlled release technology...

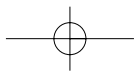
Multigreen controlled release fertilisers release their nutrient according to soil temperature only, through a semi-permeable resin coating. Imagine the coating of a granule as the pores in a tea bag. As the soil temperature increases above 6°C, nutrient is forced out of the granule into the surrounding soil. If the soil temperature drops, the pores close and nutrient release slows down, stopping once the soil temperature drops below 6°C. Unlike other controlled release fertilisers, Multigreen is unaffected by soil moisture levels, pH and bacterial activity and thereby provides optimum release in our ever-changing climate.

<p>Multigreen 20+0+32</p> <p>A single application, controlled release fertiliser featuring temperature-only released nitrogen and potassium. 30% of the nitrogen is uncoated for immediate results. Sulphur-free formulation.</p>	<p>5-6 month longevity</p> 	<p>Granule size 2.4mm</p> <p>Suitable for cutting heights ≥10mm</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>30g / m² - 12 bags / hectare</td></tr> <tr><td>Normal</td><td>35g / m² - 14 bags / hectare</td></tr> <tr><td>Heavy</td><td>50g / m² - 20 bags / hectare</td></tr> </table> <p>Application Period September - November</p>	Light	30g / m ² - 12 bags / hectare	Normal	35g / m ² - 14 bags / hectare	Heavy	50g / m ² - 20 bags / hectare
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<p>Multigreen 3 18+0+28+2MgO</p> <p>A single application, controlled release fertiliser featuring temperature-only released nitrogen and quick release potassium. 43% of the nitrogen is uncoated for immediate results. Sulphur-free formulation. Cost effective.</p>	<p>3-4 month longevity</p> 	<p>Granule size 2.4mm</p> <p>Suitable for cutting heights ≥10mm</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>25g / m² - 10 bags / hectare</td></tr> <tr><td>Normal</td><td>30g / m² - 12 bags / hectare</td></tr> <tr><td>Heavy</td><td>35g / m² - 14 bags / hectare</td></tr> </table> <p>Application Period September - November</p>	Light	25g / m ² - 10 bags / hectare	Normal	30g / m ² - 12 bags / hectare	Heavy	35g / m ² - 14 bags / hectare
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<p>Multigreen Fine 19+0+30</p> <p>A single application, mini prilled controlled release fertiliser featuring temperature-only released nitrogen and quick release potassium. Ideal for close mown surrounds and tees. 45% of the nitrogen is uncoated for immediate results. Sulphur-free formulation.</p>	<p>5-6 month longevity</p> 	<p>Granule size 1.2mm</p> <p>Suitable for cutting heights ≥6mm</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>25g / m² - 10 bags / hectare</td></tr> <tr><td>Normal</td><td>30g / m² - 12 bags / hectare</td></tr> <tr><td>Heavy</td><td>35g / m² - 14 bags / hectare</td></tr> </table> <p>Application Period September - November</p>	Light	25g / m ² - 10 bags / hectare	Normal	30g / m ² - 12 bags / hectare	Heavy	35g / m ² - 14 bags / hectare
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About Xtend phased release technology...

Xtend nitrogen technology is unique in providing a dual-release mechanism to increase the efficiency of the applied nitrogen. Xtend granules are coated with two soluble coatings which break down with the granule soon after application. The first coating prevents loss of nitrogen to the atmosphere by volatilisation for the first two weeks after application, the second slows down the conversion of nitrogen in the soil by maintaining it in the form of ammonium nitrogen. Ammonium nitrogen is more readily held by soil and organic matter and so persists in the soil longer, extending its availability. The result is a cost-effective 2-3 month release in a form which solubilises into the sward within 48hrs.

<p>Xtend 15+5+20+5MgO</p> <p>A single application, phased release fertiliser featuring slow release nitrogen, quick release phosphorus and potassium and magnesium. 43% of the nitrogen is uncoated for immediate results.</p>	<p>2-3 month longevity</p> 	<p>Granule size 2.4mm</p> <p>Suitable for cutting heights ≥8mm</p> <p>Pack size 25kg</p>	<p>Application Rates</p> <table border="1"> <tr><td>Light</td><td>20g / m² - 8 bags / hectare</td></tr> <tr><td>Normal</td><td>25g / m² - 10 bags / hectare</td></tr> <tr><td>Heavy</td><td>30g / m² - 12 bags / hectare</td></tr> </table> <p>Application Period September - November</p>	Light	20g / m ² - 8 bags / hectare	Normal	25g / m ² - 10 bags / hectare	Heavy	30g / m ² - 12 bags / hectare
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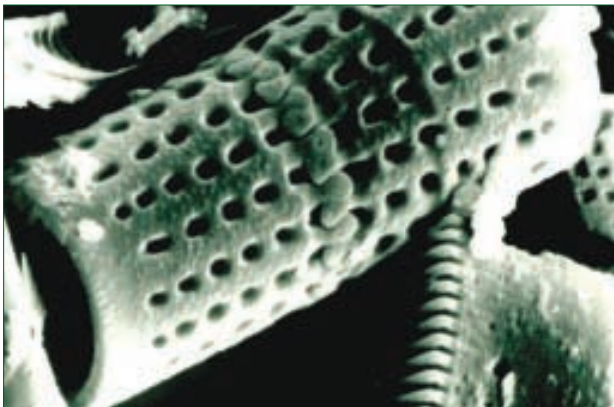
AXIS - Soil Amendment A Solution for Poorly Performing Greens

Where to use it



- On compacted soils with low oxygen content and anaerobic conditions
- On badly draining, waterlogged greens
- To encourage root development in poorly constructed rootzones with high fine sand and / or silt content
- On areas prone to droughting out

What is AXIS and what are its benefits?



AXIS is a natural mineral, composed solely of granular diatomaceous earth made up of trillions of microscopic skeletons. Under a microscope (see pic) they resemble sponge-like structures, which possess unique properties in terms of water absorption over their extremely high surface area. When AXIS is added to soils it greatly increases the air and water capacity of that soil by drawing moisture into its structure from the surrounding rootzone.

The result of this process is that more moisture can be held in the rootzone before saturation point is reached and therefore the soil has a higher field capacity.

On waterlogged greens, applications of AXIS show an immediate benefit in soaking up excess moisture, increasing soil oxygen levels (because less pore spaces are occupied by water) and from a practical perspective, the surface firms up considerably. The unique properties of AXIS allow this moisture to be released back into the soil during periods of drought and therefore use of AXIS has benefits in both excessive and moisture-lacking situations. AXIS is a permanent, non-compacting addition to your rootzone and therefore results are long-term in increasing rootzone oxygen levels and allowing the grass plant to develop a better root system.

Less is more

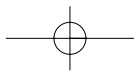
With soil amendments, it is the volume of material applied that matters, not the weight and so the lighter the material, the more you get for your money. As the chart shows Axis gives you more volume for the same weight compared to other well-known soil amendments.



How much do you need to use?

The bottom line with AXIS is that the more you can incorporate at any one time, the more noticeable the effects will be.

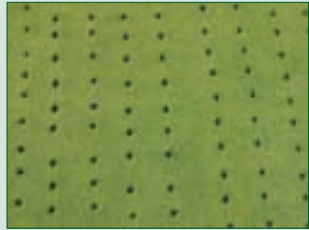
The average green in the UK is between 400 – 500m² and a rough guide is that between 17 – 25 bags can be incorporated at verti-draining using 1" tines, at 4" spacings and achieving a consistent depth of 8 – 10". The target figure is to incorporate 10 – 12% of AXIS by volume across the rootzone depth that you are working during aeration practices. If you are not planning to vertidrain, AXIS can also be incorporated during hollow coring, although the amount of material used is less, typically 8 – 12 bags when coring at 4 – 6" depth.



AXIS - Soil Amendment How Best to Incorporate AXIS

As mentioned above, AXIS is best incorporated after coring, solid tining or verti-draining, with the latter being the most effective method. The procedure shown in the sequence at the bottom of the page is in our opinion the most effective way to apply AXIS to golf greens.

Step 1...



Firstly the green is verti-drained at 4" spacings using 1" tines to a depth of 8-10".

Step 5...



As more area is covered, supplementary bags are added and the operation continues.

Step 2...



Starting at one end of the green, 15 - 17 bags of AXIS are spread across the surface and distributed evenly using the backs of rakes.

Step 6...



Close up of the green surface after the operation has been completed.

Step 3...



A team of four pull the product across the green toward the opposite end, whilst a compact tractor fitted with a Greensward MaxiBrush® moves the product in the same direction.

Step 7...



Once the operation is completed, the irrigation is applied to water the product in.

Step 4...



The procedure is repeated and the material is drawn across the green.

Step 8...



Green surface three days after operation – Note lack of dew on green compared to the fairway as the AXIS has already started to 'wick up' the surplus moisture from the green.

