



Improving soil and plant health since 1990



SYMBIO – The Life in Your Soil



SPORTSTURF | LANDSCAPE | WATER

Biologically active soil

Turf managers need biologically active soil because the microbes in your rootzone perform the following functions:

- Produce enzymes to degrade and mineralise thatch
- Create humus to increase CEC and improve soil structure
- Bind soil particles together to create space for air and water
- Solubilise locked up nutrients and introduce them into the plant
- Convert plant protein and carbohydrates to plant food
- Drive the nitrogen cycle
- Make fertilisers available to the plant
- Competitively exclude turf diseases and fairy rings
- Produce antibiotics to counter disease
- Stimulate plant hormone production
- Determine the grass species you grow
- Prevent dry patch

Symbio provides the microbes that may be missing in intensively used and managed rootzones.

**Biologically Active Soils
= Healthy Plants**



- 1 Apply or create correct soil biology**
- 2 Feed the plant, balance the soil chemistry**
- 3 Feed the biology**
- 4 & 5 Solve any problems**

Section **1** pages 6-10

Applying Soil Biology

Explains the different products needed for each situation found in intensively managed sports turf.

Section **2** pages 11-15

Fertilisers and Nutrition

Symbio supplies a complete range of fertilisers and trace elements for all types of sports turf. Organic, inorganic, microbially enhanced with mycorrhizae and bacteria or simple straight.

Section **3** pages 16-18

Biostimulants – Keeping the Biology Alive

A comprehensive range of biostimulants to feed the soil microbiology and keep it alive.

Section **4** pages 19-20

Dry Patch and Percolation Management

Chemical, organic and biological solutions to water management.

Section **5** pages 21-23

Problem Solving with Symbio

An excellent range of products to for natural IPM programs, to rapidly repair nematode and dry patch damage, degrade oil spills and treat wash down waste.

Section **6** pages 24-26

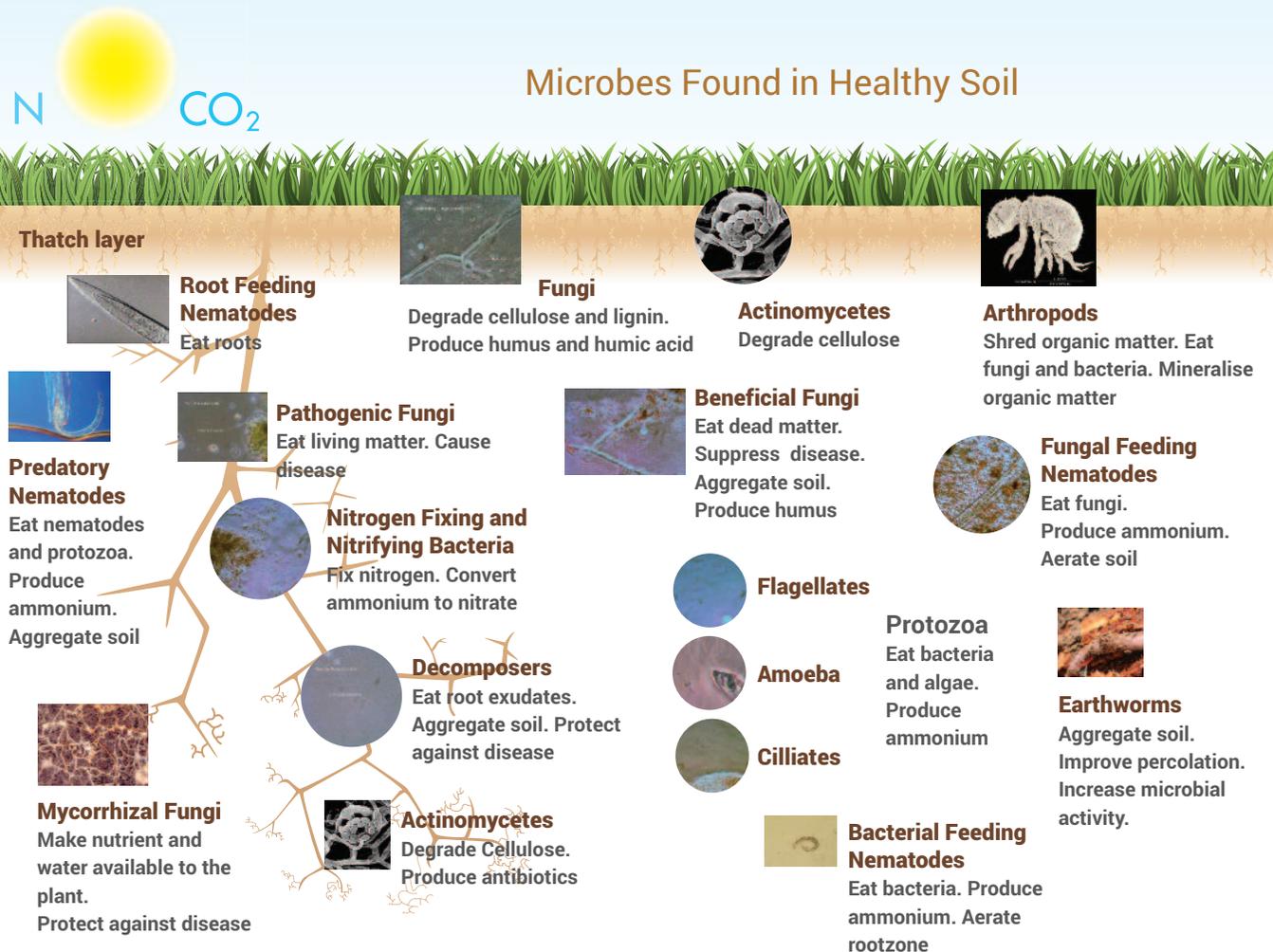
Micobial Solutions for Easy Tree, Shrub, Lake and Pond Management

Section **7** page 27

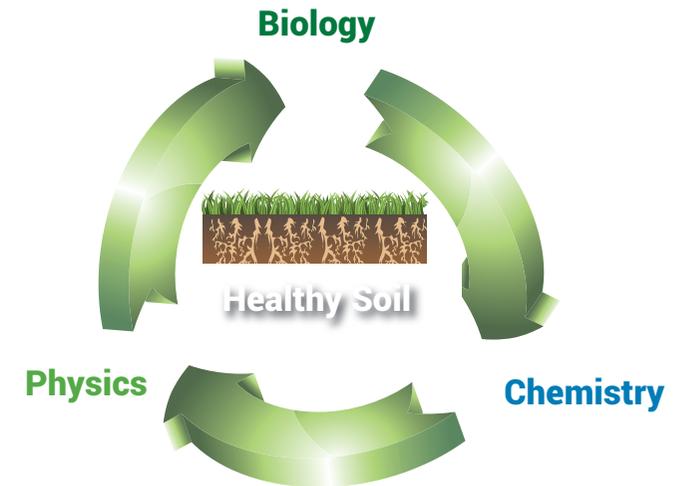
Chemical and Biological Soil and Water Analysis

Symbio – creating healthy rootzones for healthy plants

Symbio creates a healthy soil food web for all grasses and plants



A healthy rootzone for healthy grass must have good biology, chemistry and physics. Biology controls the chemistry and physics.



The Symbio Approach

1. Assess the grass species, rootzone profile and physical soil structure.
2. Analyse the chemistry and available nutrients in the rootzone.
3. Understand our customers requirements based upon the data available and preferred management practices.
4. Correct nutrient imbalances and adjust soil chemistry to bring base saturation ratios into balance and increase Cation Exchange Capacity for optimal nutrient availability and uptake.
5. Devise a programme to solve existing problems and create and maintain healthy grass and plants growing in healthy biologically active rootzones.

Advantages of a biologically active rootzone

Convert thatch to humus and plant food



5cm thatch layer remains after 2 years of hollow coring and 200 tonnes p.a. top dressing



2 years after Symbio ThatchEater with hollow coring replaced by sorrel rolling and solid tining. Top dressing reduced to 120 tonnes p.a.

Pictures courtesy Bromborough Golf Club

Reduce or eliminate the need for hollow coring and reduce top dressing



Inorganic fertilisers, hollow coring and top dressing



Symbio programme – no hollow coring

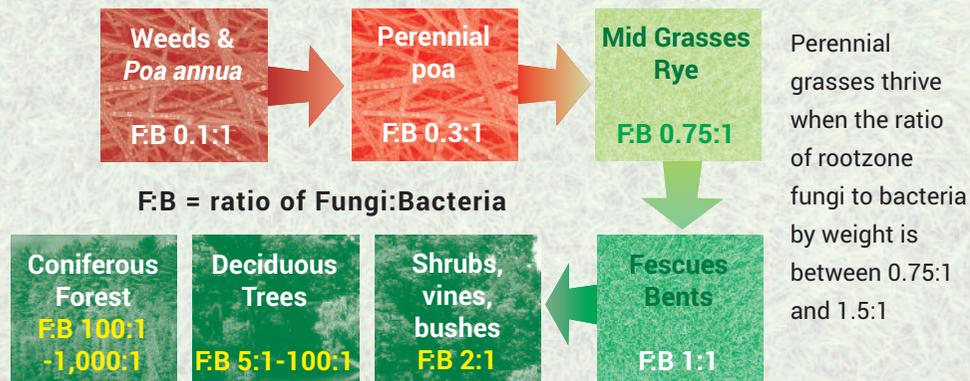
Trial conducted by Reaseheath College

Pictures taken 9 November 2011

5 greens were managed with a conventional inorganic fertiliser programme, hollow coring 2x per year and top dressing. 5 greens were managed with a Symbio biological and nutrition programme with no hollow coring. Both were micro tined.

Develop the correct soil biology to grow perennial grasses

Ratio of rootzone fungi to bacteria by weight



Other important benefits

- ✓ Improve the playing surface
- ✓ Reduce disease
- ✓ Reduce dry patch and fairy rings
- ✓ Reduce fertiliser inputs
- ✓ Reduce management costs

Symbio Solutions for Common Problems

Problem	Causes	Symbio Solutions
Too much thatch, causing soft surfaces, waterlogging and disease	Thatch is degraded and converted to humus by fungi and bacteria in the presence of oxygen. If microbes or oxygen are lacking thatch builds up.	Symbio Thatch Eater or Compost Teas, fertilisers with thatch eating fungi. Oxygenate with Liquid Aeration and micro tinning.
Fairy Rings	Over 50 types of basidiomycete fungi cause fairy rings. They come to the surface to reproduce when there is no other bacteria and fungi to prevent their growth.	Inoculate rootzone with beneficial fungi in Compost Teas, Liquid Fungi Booster, or Symbio BioTabs and convert organic matter to humus.
Fungal Dry Patch	A build-up of protein and secretions delivered by fungi in the rootzone, which coat the soil particle with a hydrophobic layer.	Symbio Aquacept contains microbes that digest the protein, plus Symbio Incision water retaining agent.
Dry Patch	Too much thatch or poor root development, rootzone drains too quickly or not enough water.	Symbio Incision or HydroAid Plus with appropriate solution for thatch, poor roots. Increase water retention long term with Symbio TraceOlite.
Disease	Weakened plants and lack of competing beneficial microbes in the rootzone, thatch and lack of oxygen.	Create a strong plant growing in healthy soil with a complete Symbio program, plus Symbio PhytoGro, Symbio Silicon, Symbio Phosphite, Symbio Defender, Symbio BioTabs.
Poor germination and <i>poa annua</i> invasion	Too much thatch and/or a bacterial dominant rootzone with little or no mycorrhizal fungi that support perennial grasses.	Break down thatch as above and coat perennial grass seed with Symbio Mycorrhizal SeedCoat. Create fungal dominant rootzone and apply MycoGro fertilisers to maintain mycorrhizal colonisation.
Nematode damage	Root eating nematodes invade the root system when there are not enough predatory and other beneficial nematodes to maintain a balanced population.	Reintroduce predatory nematodes in compost teas and encourage rapid root regrowth with Symbio Root Repair and Vermi Extract.
Poor spring growth, and slow start to <i>poa annua</i> growth	If temperature is warm enough for growth a lack of carbohydrate in the plant and limited nutrient uptake due to low microbial activity.	Apply CMS Shoot 5.0.2 or Symbio Caviar 10.0.4 fertilisers with Liquid Aeration and coat new seed with Mycorrhizal Seed Coat. Chelate inorganic nutrients with Symbio Fulvic Booster.
Compaction, excess water retention and banding in the rootzone	Lack of oxygen, humus and microbial activity to create space for air and water and assimilate locked up nutrients.	Apply Compost Teas or Vermi Extract and Liquid Aeration and micro tine to different depths.
Excessive fertiliser requirement	The microbes that drive the nitrogen cycle, solubilise locked up nutrients and degrade thatch are missing from the soil. Plus low CEC, humus or organic matter, or base saturation not in balance.	Correct interpretation of chemical soil analysis and balance base saturation. Apply the missing microbes from the Symbio product range and keep them alive with Symbio Biostimulants. Apply Symbio TraceOlite, or convert thatch to humus to increase CEC.
Algae in ponds, lakes and irrigation water	Water ecosystem out of balance due to high nutrient input or artificial construction.	Apply Symbio Blue Water or Symbio Barley Straw Extract
New trees die or take a long time to establish	Wrong type of nutrients and lack of mycorrhizal fungi.	Plant with Mycorrhizal Transplanter or Whip Dip plus Symbio Caviar 10.0.4.

Applying Soil Biology

Symbio's Biofixation Technology Provides the Foundation for Healthy Rootzones

SYMBIO THATCHEATER

DEGRADES THATCH WITH MINIMAL DISRUPTION – GUARANTEED

- Reduces the need for hollow coring and top dressing
- Bacteria and fungi produce enzymes to degrade thatch for a whole season with just one application
- Degrades thatch and mineralises organic matter
- Releases nutrients for sward development
- Releases food for fungi to help promote fine grasses
- Improves surface drainage and prevents black layer

Symbio ThatchEater is applied in spring, converting thatch to plant food and the humus, humic and fulvic acids that create a free draining rootzone and sustainable plant growth.

Savings made from reduced hollow coring, top dressing, fertiliser and fungicide inputs often pay for the entire thatch reduction programme.

ThatchEater is guaranteed, with a product replacement guarantee if you follow our instructions regarding aeration and nutrition and do not see a reduction in thatch density and nutrient input. To ensure success and benefit from our product replacement guarantee, please arrange a greens inspection with Symbio or an authorised distributor.

APPLICATION



Pack size 25Kg

Improved Formulation

Produces more lignase and cellulase enzymes to break down thatch



105 year old green showing break down of thatch and conversion to humus and plant food. The rootzone is friable and drains well. Photo taken 29th April.

SYMBIO GREENCIRCLE

PROVIDES THE FOUNDATION FOR THE BIOLOGICAL APPROACH TO SPORTS TURF MANAGEMENT TO MAINTAIN FAST, THATCH AND STRESS-FREE GREENS

- Degrades thatch as it forms and improves plant nutrient uptake
- Promotes greater root development and sward density
- Reduces fertiliser and chemical use
- Increases turf vigour, wear and stress resistance
- Helps promote perennial grasses over *Poa annua*

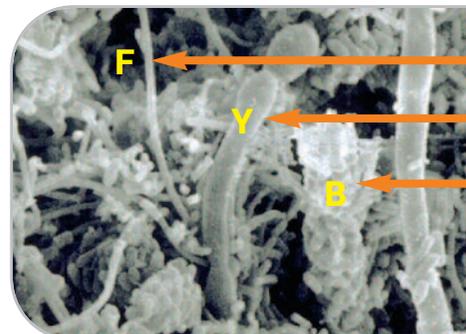
One application in spring lasts for the entire growing season.

Symbio GreenCircle contains facultative aerobic bacteria and fungi that are essential to the nitrogen cycle, plant nutrition and the higher elements of the soil food web. For best results use with Symbio MycoGro Complete fertilisers.

APPLICATION



Pack size 25Kg



Fungal Hyphae

Yeast

Bacteria

Biofixation Technology – Electron micrograph of microbes on a protective mineral support

Biofixation

The process of Biofixation, the fixing of bacteria and fungi to mineral supports by chemo-osmoregulation, is at the centre of our biotechnical developments. It represents a considerable advance in the application of biotechnology and depends upon fixing selected strains of natural microorganisms to carefully chosen mineral supports. The unique combination of microbes and support gives the bacteria and fungi superior metabolic activity, toxin resistance and reproduction capacity that are substantially greater than found in free living and bio-augmented microorganisms.

"The greens at Baberton suffered with thatch build up, shallow rooting and black layer due to excessive applications of inorganics. We needed to change our direction and philosophy. Working with Symbio we have seen significant improvements to soil and turf health and look forward to continuing a sustainable approach".

Gary McKenna | Course Manager, Baberton Golf Club

SYMBIO MYCORRHIZAL INOCULANT

FOR RAPID DEVELOPMENT AND LOWER COST MAINTENANCE OF NEWLY SEEDED OR TURFED SPORTS TURF

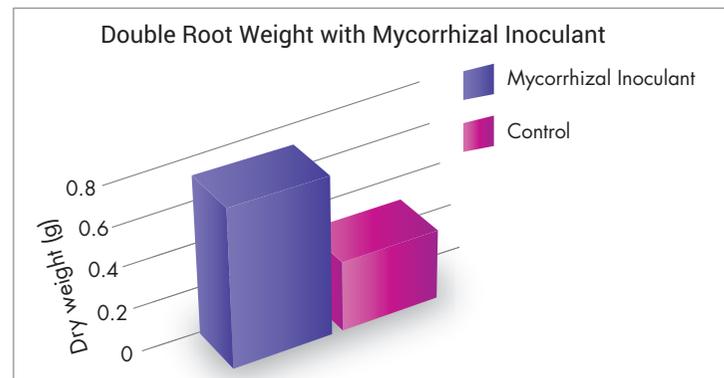
- Promotes rapid establishment and longevity of perennial grasses
- May reduce grow in time by months
- Greatly improves root mass and increases nutrient uptake
- Mycorrhizal grass needs less fertiliser and water
- Degrades thatch under newly laid turf
- Mycorrhizal grass is less susceptible to and recovers faster from disease
- Restores heavily stressed or worn turf

The soil in new sand-dominated sports pitches is almost sterile. **Symbio Mycorrhizal Inoculant** contains 9 species of endo mycorrhizal fungi, growth-promoting soil fungi and bacteria, biostimulants, zeolite and soil nutrients to kick-start the soil's natural food web.

APPLICATION



Pack size 25Kg



Trial conducted by J Shannon – Lowe University of Surrey

SYMBIO RESISTER

FOR STRONG GROWTH AND DISEASE RESISTANCE IN AUTUMN AND WINTER

- Breaks down thatch which harbours disease-causing fungi
- Uses available nutrient for beneficial microbial and turf growth
- Promotes root development and increased winter wear resistance
- Increases turf vigour and natural plant protection
- Increases fungal populations to promote fine grass growth

Symbio Resister contains bacteria and fungi chosen for their ability to degrade thatch and utilise available nutrient for strong plant growth and to promote a healthy beneficial microbial population in the rootzone. Vigorous grass, efficient utilisation of nutrients and a biologically active root zone are important factors in maintaining a healthy sward that is resistant to disease, thinning, moss and other problems associated with winter play. One application will last up to 6 months.

APPLICATION



Pack size 25Kg



New golf green grown in with a Symbio programme.



"Ever since we started using Symbio Mycorrhizal Inoculant, MycoGro Complete Fertilisers and TraceOlite the root depth and density has been fantastic producing a dense grass sward capable of withstanding heavy Premier Football play."

Paul Fiske
Head Groundsman,
Aberdeen Football Club

COMPOST TEA BREWERS

Compost tea is a highly concentrated microbial solution containing a wide range of the bacteria, fungi, protozoa and beneficial nematodes that create healthy biologically active soil in which to grow healthy plants.

Symbio's Bio Brewers suit every situation from entire golf courses and playing fields to bowling greens. Creating healthy biologically active soil with compost tea.

- Improves soil structure, oxygen diffusion, water infiltration and depth of active rootzone
- Reduces the need for hollow coring and heavy top dressing
- Retains and recycles nitrogen and other nutrients
- Rapidly decomposes thatch and turns organic matter into humus
- Produces hormones that encourage plant growth
- Reduces opportunities for pathogens to grow
- Creates the biology to promote rye, fescue and bent grass over *Poa annua*

SYMBIO BIO BREWER 25



Symbio Bio Brewer 25 makes 25 litres of compost tea concentrate. Ideal for bowling greens, cricket squares, soil based winter sports pitches and lawns. The Bio Brewer 25 is easy to clean and is supplied with everything needed to make microbially active compost tea.

SYMBIO BIO BREWER 800



Makes between 100 and 800 litres to cover from 1 to 15 hectares. Designed for use on all golf courses, farms and sports pitches.

SYMBIO BIO BREWER 200



The Bio Brewer 200 makes 200 litres of excellent compost tea which will cover up to 2 hectares of sand rootzones or 4 hectares of soil rootzones.

SYMBIO IBC AERATOR



Designed to fit in a 1000L IBC. Makes between 800 – 1000 litres of compost tea to treat a growing area of up to 25 hectares.

SYMBIO COMPOST TEA PACK

Improved for 2018

COMPLETE COMPOST TEA PACKAGE FOR USE WITH ALL COMPOST TEA BREWERS

The **Symbio Compost Tea Pack** has been specially formulated using Symbio's composting microbial technology. Each batch is tested to ensure it contains:

- Specially formulated compost with high populations of natural soil fungi and essential bacteria plus protozoa and beneficial nematodes
- A comprehensive nutrient pack containing the nutrients required for bacterial and fungal growth



Pack sizes **50 litres, 100 litres** (makes a minimum of 50 or 100 litres of compost tea concentrate)

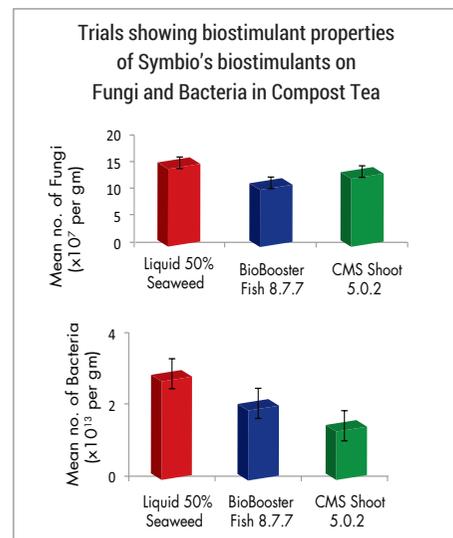
“Working with Symbio compost tea and biostimulants has resulted in a huge increase in bent grass, without overseeding, and a dramatic reduction in fertiliser and fungicide use.”

Finbarr Coughlan | Water Rock GC, Co Cork, Ireland

APPLICATION and TIMING

For soils that have been subjected to heavy inorganic fertiliser and pesticide use, apply every 7 days for the first two applications and then every 3 or 4 weeks. If the sward has traditionally been subject to bad attacks of disease, increase the frequency of application just before disease usually attacks and during times when disease is usually prevalent. Compost Tea is not a pesticide but plants growing in healthy soil are less susceptible to many common diseases.

- For sand rootzones dilute 100 litres of Compost Tea in 300-750 litres of clean water per hectare.
- For soil rootzones e.g. football pitches and fairways dilute 50-100 litres of Compost Tea in 300-600 litres of water per hectare.



SYMBIO BACTERIAL ADDITIVE FOR COMPOST TEAS

A mix of 16 species of soil bacteria concentrated at 2×10^9 CFU per gram. The bacteria are used to boost the compost tea to stimulate growth in early spring and late autumn. If your sward is predominantly *Poa annua* that requires a bacterial dominant rootzone then Bacterial Additive may be applied throughout the growing season. Just add 250gms to your compost tea at the beginning of the brewing cycle.

APPLICATION



Pack sizes 250g, 2.5Kg

SYMBIO FUNGAL ADDITIVE FOR COMPOST TEAS

This highly concentrated mix of 7 species of soil fungi is selected for its ability to degrade thatch and organic matter converting it to humus and essential organic acids. The fungi also maintain the fungal dominance needed for perennial grass growth and to help out compete the fungi that cause fairy rings and fungal dry patch. Simply add 200-500g per hectare to your compost tea at the beginning of the brewing cycle.

APPLICATION

Sand rootzones



per hectare

Soil rootzones



per hectare

Pack sizes 1Kg, 5Kg

Sterile v Biologically Active Rootzone



Comparison of grass roots grown in sterile rootzone to grass grown with compost teas and with mycorrhizae.

(Trial performed by Josh Webber Portmore GC at Myerscough College)

SYMBIO VERMI EXTRACT



Symbio Vermi Extract is a probiotic liquid extraction derived from organic Vermicompost. It contains soil bacteria, fungi and protozoa, which form the foundation of a healthy Soil Food Web, it contains no chemical additives, and may be sprayed without Basis certification.

- Contains soil bacteria, fungi and protozoa
- Rapidly repairs disease, nematode and dry patch damage
- Converts root exudates and fertilisers into plant available nutrition
- Microbial activity improves soil friability and percolation rates
- Increases humus production for improved water and nutrient retention.
- Promotes greater root development and sward density
- Healthy plants require less fertiliser and fungicide

APPLICATION and TIMING

Apply as a soil drench in 400-600 litres of water per hectare. Initial application of 20 litres per hectare.

Then every 3-4 weeks.

To repair disease scars, nematode or dry patch damage apply 10 litres per hectare every two weeks.



Pack size 10 litres

Mycorrhizal Fungi for Grass and Seed

What do Mycorrhizae do?

Mycorrhizal fungi expand the root system of the plant, allowing it to take up nutrients and water more efficiently.

Mycorrhizae also help fescue, bent, rye and perennial *Poa annua* species to dominate *Poa annua*.

For research and trials data, contact Symbio or log on to our website www.symbio.co.uk



Roots treated with Mycorrhizal seed coat on the left, untreated on the right.

SYMBIO MYCORRHIZAL SEEDCOAT

FOR THE RAPID ESTABLISHMENT OF PERENNIAL GRASSES

- Improves establishment of fine grass seed in new and old sward
- Increases the percentage of fine grasses in the sward over *Poa annua*
- Greatly improves root mass and increases nutrient uptake
- Mycorrhizal grasses need up to 30% less water in times of drought
- Mycorrhizal grass suffers less from disease, heat and cold stress

Symbio Mycorrhizal SeedCoat contains spores of 9 beneficial endo mycorrhizal fungi, plus growth promoting bacteria and fungi.

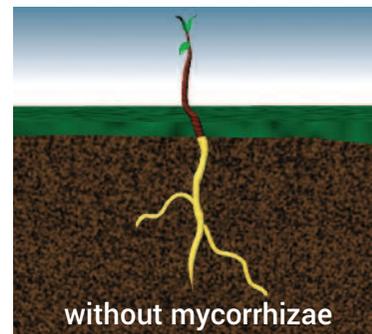
APPLICATION and TIMING

Mix 3Kg of Mycorrhizal SeedCoat per hectare with seed regardless of the amount of seed used. The aim is to achieve even coverage of the Mycorrhizal SeedCoat across the sward using the seed as a carrier.

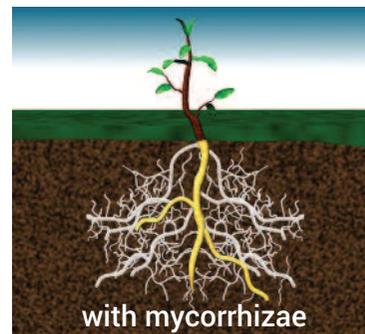
APPLICATION



Pack sizes 500gm, 1.5Kg



without mycorrhizae



with mycorrhizae

Mycorrhizal fungi extend the root systems of the plant

SYMBIO LIQUID ENDO MYCORRHIZAL INOCULANT FOR GRASS

APPLICATION and TIMING

Apply 200 mls per hectare either as a seed coat or diluted with enough water to act as a root drench.

Symbio Liquid Endo Mycorrhizae contains 4 species of endo mycorrhizae. It may be applied as a seed coat, root drench, mixed with compost teas or injected into the rootzone by Ground Probe Aeration.

DO NOT MIX with inorganic fertilisers or pesticides. Only prepare sufficient diluted inoculant for use within 12 hours.

APPLICATION



Pack sizes 200ml, 1 litre

Symbio is pleased to supply the Johnsons and Masterline Range of seeds pre-coated with Mycorrhizal SeedCoat.



Base Saturation and CEC

Base Saturation

The correct balance of positive alkaline (base) ions calcium magnesium, potassium, sodium and hydrogen is important for nutrient availability and soil pH. Based upon your chemical soil analysis Symbio will calculate the correct amounts of calcium, magnesium and potassium required to bring the base saturation ratios into balance. Ideally the ratio of Ca:K:Mg should be approximately 7-10:2:1.

Cation Exchange Capacity – CEC

The Cation Exchange capacity of the soils measures the ability of the soil to hold onto the positive nutrients ions like calcium, magnesium, potassium and ammonium. Sand has almost no ability to hold onto nutrients. The two easiest ways to increase CEC is to convert thatch to humus or apply Symbio TraceOlite a mineral with an exceptionally high CEC 130-270 meq/100gm.

Simply put the higher the level of CEC and the better the base saturation balance the less fertiliser you need to apply.

Calcium

Calcium is essential for strong plant cells and disease resistance in the plant. It is also the main component of the base cations and should make up at least 65% of the cations in the soil so the soil is kept open for air and water transfer and microbial growth. Too little calcium reduces nitrification and phosphate uptake.

CALCIUM CARBONATE CaCO_3 – For soils with a pH <5.5
CALCIUM SULPHATE CaSO_4 (Gypsum) – For soils with a pH>5.5
 Both products are greens grade granules 1-1.5mm applied by fertiliser spreader into tine holes.

APPLICATION

In spring or early summer, mix with top dressing or apply by itself – brush into tine holes after aeration.



Pack size **25Kg**

Magnesium

Correct magnesium levels are needed for quality rootzones and efficient nutrient uptake. Magnesium should comprise at least 5% and up to 10% of the base cations in the soil.

KIESERITE 16% MgO

Kieserite, a greens grade granule 1-1.5mm, is the most effective way to manage magnesium shortfall.

APPLICATION

At any time of year. Mix with top dressing or apply by itself – brush into tine holes after aeration.



Pack size **25Kg**

SYMBIO TRACEOLITE

A long lasting mineral, **TraceOlite** is a natural zeolite, packed with trace elements, with unique physical, chemical and cationic exchange properties. (130 - 270 meq/100gm).

- Boosts cation exchange capacity (CEC), re-mineralises poor soil
- Holds over 40% of its weight in water
- Prevents water logging, hardens soft playing surfaces, extends winter play
- Dramatically reduces fertiliser leaching and chemical run off
- Reduces grow in time and maintenance costs of new constructions

APPLICATION

To increase Cation Exchange Capacity.



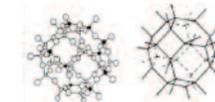
To firm and dry wet playing surfaces. Either via tine holes or mixed with top dressing.



Pack sizes **25Kg, 1,000Kg**



TraceOlite's three dimensional lattice allows for a very high cation exchange and water holding capacity



Zeolite (Phillipsite) showing massive internal surface area under an electron microscope

Fertilisers and Nutrition

Symbio reduces fertiliser inputs by adding mycorrhizal fungi and soil bacteria and fungi to its fertilisers to use the nutrients produced by nature and the nutrients locked up in the rootzone.

Natural grasses get their nutrient from root exudates containing protein and carbohydrate, thatch degradation, organic matter, excreted nitrogen and phosphate in animal waste and in smaller amounts from rainfall and nitrogen fixation.

Bacteria and mycorrhizal fungi also solubilise essential nutrients, such as phosphate and magnesium, locked up in the soil and make them available to the plant.

Easy to spread fertilisers with mycorrhizal fungi, soil fungi, bacteria, zeolite and seaweed meal

- Promotes the establishment of fescue, bent and rye grasses
- Mycorrhizae improve root mass and increase nutrient and water uptake
- Increases plant tolerance to drought and stress conditions
- Faster grow-in and establishment of new grass seeds and turf
- Healthy grass growing in a microbially active root zone suffers less and recovers faster from disease

SYMBIO MYCOGRO COMPLETE BIOLOGICAL FERTILISERS

WITH MYCORRHIZAE, FUNGI AND BACTERIA

SPRING and SUMMER

- Symbio MycoGro 10.0.0 + 4% Mg
- Symbio MycoGro 10.0.10 + 4% Mg
- Symbio MycoGro 10.0.20 + 2.4% Mg
1.6% Fe

All with trace elements.

AUTUMN, WINTER and SPRING

- Symbio MycoGro 5.0.28 + 2.4% Mg 1% Fe with trace elements.
- Symbio MycoGro 9.3.14 + 2% Mg 2% Fe (without mycorrhizae).

APPLICATION



Pack size 20Kg

MycroGro Complete Biological fertilisers contain readily available inorganic nutrients. See product data sheets for the nutrient sources within each fertiliser.

SYMBIO MYCOGRO COMPLETE ORGANIC BIOLOGICAL FERTILISERS

ORGANIC FERTILISER, RICH IN HUMUS WITH ADDED MYCORRHIZAE, SOIL FUNGI, BACTERIA AND SEAWEED MEAL

Organic fertilisers put life back into your soil. Symbio's **MycroGro Organic Fertilisers** contain poultry manure, composted to 70°C to kill all weeds and pathogens. The organic content contains 76% humus and all the macro and micronutrients grass plants need for healthy growth.

CHEMICAL ANALYSIS

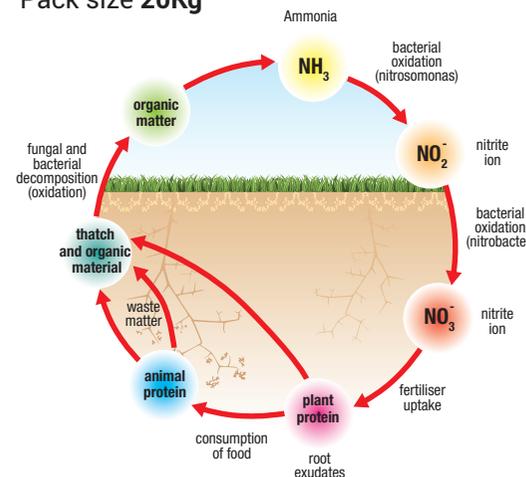
- Symbio MycoGro 5.3.8 - 100% Organic.
- Symbio MycoGro 10.2.10 + 4% Mg - 50% Organic
- Symbio MycoGro 5.2.10 + 4% Mg, 2% Fe - 50% Organic

APPLICATION



Organic content contains the trace elements: Copper, Magnesium, Manganese, Zinc, Molybdenum, Sulphur, Boron, Iron.

Pack size 20Kg



Symbio MycoGro Fertilisers contain a broad spectrum of plant essential microbes including a minimum of 15,400 spores/propagules of 9 species of endo mycorrhizal fungi, 7 essential soil fungi for thatch reduction and fine grass promotion and 5 species of Bacillus bacteria for phosphate solubilisation, nutrient retention and plant growth promotion. The mycorrhizal fungi in MycoGro fertilisers are Glomus clarum; G. intraradices; G. mosseae; G. deserticola; G. monosporus; G. brasilianum; G. etunicatum; G. aggregatum and Gigaspora margarita with a minimum of 15,400 spores in every bag.

SYMBIO MYCOGRO TEE, PITCH, LAWN AND FAIRWAY FERTILISERS

CONTAIN THATCH EATING FUNGI AND BACTERIA

12.2.9	50% Organic	pack sizes 20Kg, 500Kg
7.0.10	with extra thatch eating fungi	pack sizes 25Kg, 500Kg
10.0.10	with extra thatch eating fungi	pack sizes 25Kg, 500Kg
15.2.15	20% Methylene Urea	pack sizes 20Kg, 500Kg

- Fungi convert thatch, dead moss and grass clippings to humus
- Bacteria solubilise and retain nutrients
- Assists seed germination
- Creates the biology needed for perennial grass growth

APPLICATION



SYMBIO TRADITIONAL LINKS FERTILISERS

Blood and bone, hoof and horn, humates and seaweed have been used as organic nutrients for centuries and are a foundation for traditional fescue links course management.

Symbio SSD 8.0.6 + 1 Fe
 Symbio SSD 8.0.0 + 2.5 Fe
 Symbio SSD 8.0.0
 Symbio SSD 2.0.10 + 1 Mg Potash Plus

APPLICATION



Pack size **20Kg**

Granular compound fertilisers without microbes

FINE TURF MINI GRANULAR 1.5 - 3mm

12-0-9 +1Fe +0.5Mg
 12-3-9 +1Fe +0.5Mg
 3-10-5
 4-6-8 +2Fe
 11-5-5

FINE TURF MICRO GRANULAR 1.5 - 2mm

4-0-0 +11Fe
 8-0-0 +4Fe +2.4Mg
 8-0-6 +2Fe +1Mg
 5-0-28 +2Fe +1Mg
 10-4-4 +3.5Fe with Mecoprop P and 2,4D

GROW IN and OUTFIELD GRANULAR 2 - 4mm

7-7-7
 9-7-7
 6-9-6
 12-6-6
 10-15-10
 20-10-10
 11-0-13 +7Fe

FINE TURF ORGANIC BASED MINI GRANULAR 1.5 - 3mm

(10-12 Weeks Release)
 5-3-8
 18-3.5-8 +Mg +TE

TURF HARDENERS AND LAWN SAND

3.0.3 + 3Fe 1.5Mg
 3.0.0 + 7Fe

ORGANIC BASED GRANULAR 2 - 4mm

(10-12 Weeks Release)
 12-6-6
 21-1-0.45 +1Mg

APPLICATION



SYMBIO LIQUID FERTILISERS

Easy to apply, readily available nutrients for all heavily used sports turf.

16.3.10 - 15.3.3+Te - 12.0.6+Fe - 1.0.15.

20.0.10 available with seaweed and humic acid.

APPLICATION

In 400-600 litres of water.



Pack sizes **20 litres, 200 litres, 1,000 litres**

Trace Elements and Micro Nutrients



Parameter	1ST OLD	1ST NEW	3RD OLD	17TH NEW	1000 L/2000
Calcium (ppm)	42.4	50.0	61.8	508.5	600 - 1,200
Magnesium (ppm)	39.0	120.1	169.0	122.1	80 - 120
Potassium (ppm)	12.8	43.0	81.1	33.9	40 - 100
Sulfur (ppm)	15.2	17.5	19.0	11.9	0 - 10
Iron (ppm)	1.0	1.0	1.0	1.0	1.0 - 1.0

SYMBIO CHELATED IRON

Symbio Chelated Iron is an EDTA liquid formulation, rapidly assimilated by the plant to promote a very swift 'green-up' response.

Symbio Chelated Iron 6% Fe also hardens the grass against wear, whilst encouraging disease resistance. The chelated formulae ensures the product is translocated into the plant effectively and prevents the binding and 'lock-up' in the soil profile with other elements.

APPLICATION

Apply in 400-600 litres of water.

Pack size **20 litres**



SYMBIO 50/50 SOLUBLE IRON

Symbio 50/50 Soluble Iron can be used all year round, irrigate after application of the product.

APPLICATION

Diluted in 600-800 litres of water.

Pack size **10Kg**



SYMBIO TRACE ELEMENTS

Symbio Liquid Trace Elements are used in times of stress when a rapid and effective balance of the plants trace elements may be required. Symbio's liquid formulations may be used by themselves or to top up any liquid fertiliser to ensure the correct nutrients are applied for your sward.

- Foliar application for immediate effect
- Used in times of stress to re-balance the trace elements within a plant
- Can be used alone or as an addition to a fertiliser program

All Liquid Trace Elements may be tank mixed with each other, liquid fertilisers and biostimulants. When growth in cool, wet weather is needed apply with Symbio Fulvic Booster for best results.

MAGNESIUM 5% Mg

is a core component of the chlorophyll molecule and is necessary for the synthesis of amino acids, vitamins, oils and sugars.

MANGANESE 6% Mn

is used by the plant in the formation of various enzymes. It has a major role in chlorophyll synthesis and nitrogen metabolism.

CALCIUM 6% Ca

plays a major role in the development of plant and fruit cell walls, especially during cell division. It also protects cells from toxins and in slowing the aging process.

ZINC 6% Zn

is essential for protein synthesis, seed and grain formation, enzyme systems, plant maturity and growth regulation.

COPPER 6% Cu

is essential for chlorophyll production and the correct operation of photosynthesis. It also acts as an enzyme activator. Deficient turf has stunted withered leaves with often a dark blue green colour, and dead or brown spots.

BORON 15% B

is directly involved in the translocation of sugars from the leaf to the roots. Half of these sugars are exuded into the root zone to feed beneficial micro-organisms, i.e. boron has a direct biological link.

Pack size **10 litres**

Cool Season Fertilisers and Carbohydrate Biostimulants

SYMBIO CMS SHOOT 5.0.2 WITH 12% FULVIC ACID, 9% AMINO ACID

FOR THE EARLIEST START TO SPRING GROWTH

Symbio CMS Shoot 5.0.2 is made from molasses by amino acid fermentation to retain proteins and nutrients, it is a rapidly available source of carbohydrates and amino acids to boost the plants resources for strong, healthy growth.

- Stimulates soil biology for early spring root and shoot growth
- Rapid assimilation of nutrient through roots and shoots
- Stimulates photosynthesis and carbohydrate production
- Improves seed germination and survival
- Improves growth in shady conditions
- The most economic source of carbohydrates available
- Year round fertiliser for sports pitches and outfields

APPLICATION

As a biostimulant for golf greens and other grass swards.

Apply in 400-600 litres of water.

As a total fertiliser for greens, pitches, fairways and lawns.

NUTRIENT CONTENT

N 5%, P 0%, K 2% in concentrated molasses. Specific gravity 1.26.

Pack sizes **20 litres, 200 litres, 750 litres, 1,000 litres**



Cricket square renovation with Symbio Mycorrhizal SeedCoat and Symbio Caviar 10.0.4

"Our greens were usually quite slow to become active in spring. Symbio CMS Shoot 5.0.2 has accelerated early season growth for the benefit of our members and guests".

Derek Smart | Head Greenkeeper, Baberton GC

SYMBIO CAVIAR 10.0.4 ORGANIC FERTILISER WITH 25% FULVIC ACID and 15% AMINO ACID FOR FAIRWAYS, SPORTS PITCHES and AMENITY GRASS

An easy to spread 10-0-4 low salt index organic granule combining slow release nutrients, containing organic matter 45% (derived from molasses) – fulvic acid 25% – amino acids 15% with excellent biostimulant and soil building properties.

- For dense rapid growth especially in shade and cool weather
- Improves the friability of heavy and clay soils
- Improves soil structure and water infiltration
- Place under newly laid turf for rapid root establishment, even in winter
- Ideal for stadium pitches and grass in shade

CONTAINS

Nitrogen (min):	10%
Phosphorus:	0.3%
Potassium (min):	4.0%
Sulphur:	3.6%
Calcium:	1.2%
Magnesium:	0.36%
Manganese:	89 mg/kg
Zinc:	36mg/kg
Iron:	332 mg/kg
Boron:	0.01 %
Humic Acid:	3.8%
Fulvic Acid:	25%
Amino Acids:	15%

APPLICATION

30-50g/m²



Pack sizes **20Kg, 500Kg**

Before



2 weeks later after seeding and applying Symbio Caviar 10.0.4



Biostimulants – Keeping the Biology Alive

SYMBIO FULVIC BOOSTER

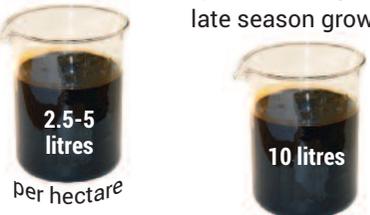
COOL SEASON GROWTH PROMOTER
AND CHELATING AGENT

Extend the growing season with Fulvic Booster. The best way to encourage early spring and late autumn growth.

Symbio Fulvic Booster is a concentrated 30% fulvic acid solution with humic acids and trace elements.

- Promotes early and late season and shaded growth
- Reduces drought stress and transpiration
- Powerful chelating agent when mixed with liquid fertilisers, trace elements and fungicides
- Thickens plant cell walls to improve cut and roll

APPLICATION

As a chelating agent and summer biostimulant

 To promote early and late season growth

In 200-600 litres of water.

To chelate liquid fertilisers and improve fungicide uptake, 5 litres per hectare. To mix with organic fertilisers and compost teas, 2.5 litres per hectare.

Pack size **10 litres**

Also available as a soluble powder at 80% concentration
Pack size **5Kg**

SYMBIO BIOBOOSTER FISH 8.7.7

- High performance plant and soil nutrient
- Rapid assimilation through roots and shoots, ideal spring starter and autumn growth stimulant
- Stimulates photosynthesis and carbohydrate production
- Aids germination and survival of young plants
- Contains growth promoters and trace elements

Symbio BioBooster Fish, is an odour free fish hydrolysate, one of nature's most efficient plant and microbe stimulants. Containing NPK of 8.7.7 and numerous trace elements which encourage plants to access available nutrient. It is an excellent low light, cool season growth promoter and biostimulant.

Nitrogen N	8.0%	Iron Fe	0.07%
Phosphorous P2O5	7.8%	Manganese Mn	0.016%
Potassium K2O	7.2%	Zinc Zn	0.006%
Sulphur S	2.7%	Molybdenum	0.009%
Calcium Ca	1.3%	Copper Cu	0.007%
Magnesium Mg	0.33%	Boron B	0.016%

BioBooster Fish 8.7.7 may be mixed with Compost Teas, and most biostimulants and inorganic fertilisers.

APPLICATION

In 300-600 litres of water.



Pack size **10 litres**

SYMBIO LIQUID 50% SEAWEED

CONCENTRATED 50% SOLID MATTER

A super concentrated Liquid Seaweed, rich in growth hormones, laminarin, fucoidan and trace elements. Made from *Ascophyllum nodosum*.

- Promotes stress-resistant, healthy plants
- Promotes the growth of fungi in your soil to help encourage fine grass growth
- Increases soil fertility
- Strong antioxidant

Laminarin and fucoidan – boost the plant's defence mechanisms against stress and disease and stimulate germination.

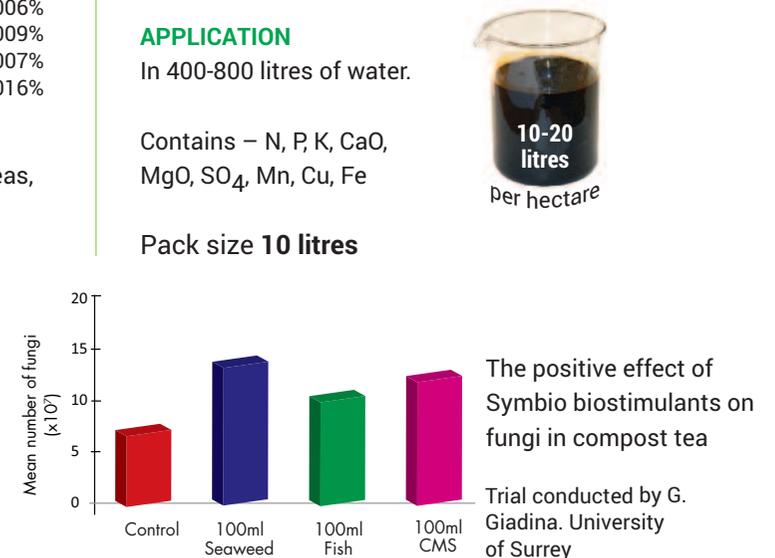
Growth Hormones – Cytokinins, auxins, gibberellins and betaines help the plant reach its genetic potential.

APPLICATION

In 400-800 litres of water.

Contains – N, P, K, CaO, MgO, SO₄, Mn, Cu, Fe

Pack size **10 litres**



SYMBIO BIOBOOSTER N 26.0.0

Symbio BioBooster N 26.0.0 contains 26% w/w nitrogen. 70% slow release from Methylene di-urea, released by microbial action. 30% fast acting Ureic Nitrogen. 7.8% Ureic Nitrogen & 18.2% Methylene di-urea.

- Combined fast and slow release nitrogen source 26.0.0
- Methylene Di-Urea low salt index fertiliser
- Provides sustained 'Green-up' lasts 4-8 weeks
- Low salt index promotes beneficial soil microorganisms

May be tank mixed with compost teas and biostimulants.

Symbio BioBooster N 26.0.0 promotes healthier and longer lasting plant root and shoot growth and microbial growth.

APPLICATION



Per hectare

As a foliar or soil drench during the growing season.

In 300-600 litres of water.

Pack size **20 litres**

SYMBIO HUMIC BOOSTER

FUNGAL BIOSTIMULANT

Apply throughout the growing season

Increases beneficial fungal activity to promote fine grass, thatch reduction and disease management.

- Increases Cation Exchange Capacity (CEC)
- Improves nutrient uptake and stimulates plant growth
- Increases microbial activity to improve soil structure

Available as a liquid or soluble powder.

Humate, humic and fulvic acids are essential food for fungi and a stimulant for plant growth and soil structure. **Symbio Humic Booster** can be applied as a foliar feed or soil drench and mixed with all Symbio products plus liquid fertilisers.

APPLICATION

Soluble



Dissolve in 400 litres of water.

Liquid



Per hectare

Apply in 400 litres of water.

Pack sizes **soluble 10Kg, 25Kg sack or liquid 20 litres**

SYMBIO SILICON

RAPIDLY AVAILABLE POTASSIUM SILICATE K₂O
12% SiO 24%.

For a faster, stronger sward

- Strengthens cell walls for stronger disease resistant grass.
- Lifts grass blade for a cleaner cut and removal of *Poa annua* seed heads.
- Increases ball roll and green speed.
- Reduces water loss in dry weather
- Foliar potassium promotes photosynthesis

APPLICATION



Per hectare

In 300-600 litres of water.
To increase ball roll or green speed apply 4-7 days before competition.

Pack size **5 litres**

Oxygen Transfer Technology

SYMBIO LIQUID AERATION

A REVOLUTIONARY PRODUCT THAT OXYGENATES THE ROOTZONE AND THATCH LAYER ENCOURAGING HEALTHY SOIL MICROBE AND PLANT GROWTH IN COMPACTED, OXYGEN STARVED ROOTZONES

- Eliminates anaerobic black layer
- Combats the effects of squidge, water logging and compaction
- Encourages the breakdown of thatch
- Substitutes physical aeration in wet conditions
- Increases the uptake of applied nutrients for rapid growth
- Encourages healthy microbial activity in the rootzone
- Friable rootzones retain water when dry, and drain faster when wet

APPLICATION

Symbio Liquid Aeration may be mixed with most biostimulants and fertilisers. If the anaerobic layer is deep in the root zone, the best results will be obtained by tining to the anaerobic layer before spraying to allow the liquid to penetrate quickly through the rootzone to the affected layer.

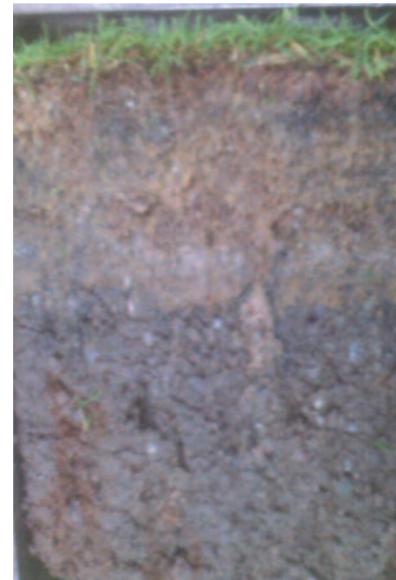


In 400-600 litres of water.

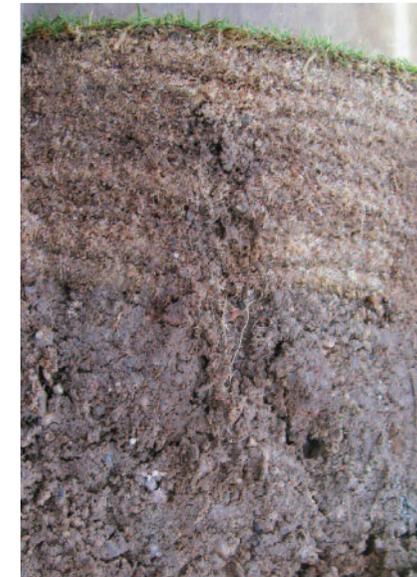
Pack size **5 litres**

"After the prolonged rainfall experienced in the area many courses were suffering the ill effects of waterlogged greens, Liquid Aeration plus Symbio Seaweed 50% immediately gave the greens a new lease of life which allowed uninterrupted play into the winter."

Sam Wardill | Head Greenkeeper, Meltham Golf Club



Before Liquid Aeration

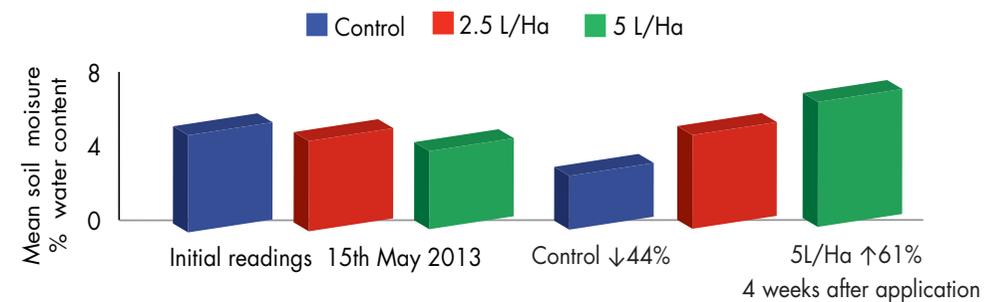


3 weeks later

Thatch reduction and rootzone improvement on a 10 year old USGA specification rootzone before and 3 weeks after application of Symbio Liquid Aeration.

Showing thatch reduction, improved friability and improved drainage.

Improved rootzone friability and water retention in drought conditions



Trial conducted by G. Giadina. University of Surrey

Innovations in Dry Patch Management

SYMBIO INCISION

A polymer wetting agent combining penetrating surfactant technology with the water retaining power of polymers. Even distribution of water throughout the rootzone is essential for the plant and playing surface in times of drought and deluge.

Incision combines

- Penetrant technology to ensure even distribution of water through the rootzone and rapid removal of excess water during times of heavy rainfall
- Water retaining polymers to hold onto water in a thin film around the soil particle to ensure the all-important airspace between soil particles is maintained in times of drought
- Uniform uptake of liquid fertilisers and pesticides is essential for level growth and Incision ensures that nutrients, biostimulants and pesticides are evenly distributed throughout the rootzone

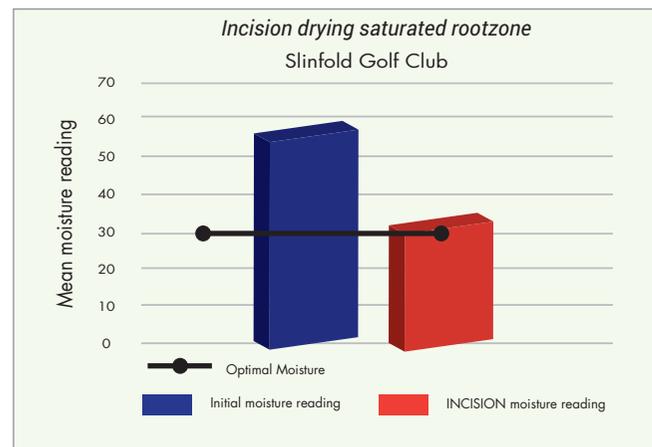
APPLICATION

Symbio Incision is best applied from spring onwards to prevent dry patch but may be used as a cure for existing dry patch at any time of year, with an initial application of 20 litres per hectare cutting quickly through the profile to the hydrophobic layer.



Per hectare

Pack size **10 litres**



Symbio Incision Trial at Slinfold Golf Club showing 43% reduction in average water content of waterlogged green from 57% to 32% saturation.

SYMBIO TRIALS DATA

Incision Wetting Agent STRI Trial



The efficacy of Symbio Incision was compared to two of the industry leading wetting agents; Qualibra and Revolution, during lab based trials conducted by STRI between February and May 2014.

20 cores were collected by STRI from the course at Royal Liverpool Golf Club, from an area known to have problematic hydrophobicity. Leached irrigation water, core weight loss and cumulative soil moisture loss were measured. Qualibra was applied at the equivalent of 20L/Ha; Revolution was applied at 19L/Ha and Symbio Incision was initially applied at 20L/Ha and then subsequent applications were reduced to 10L/Ha. All products and the control used a water rate equivalent of 700L/Ha.



Fig 1. Symbio Incision retained on average more moisture, resulting in a significantly lower core weight loss compared to the untreated control (P < 0.05).

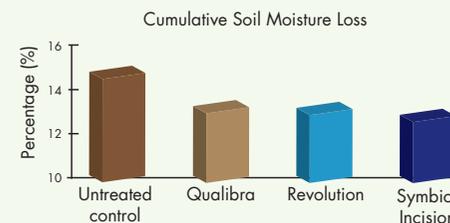


Fig 2. Symbio Incision maintained core moisture, resulting in a significantly lower cumulative soil moisture loss compared to the untreated control (P < 0.05).

Results:

Core weight loss and cumulative soil moisture loss: cores were weighed immediately prior to each wetting agent application and then again afterwards. Between applications of the wetting agents a further three measurements were recorded on a weekly basis. This data was used to produce the core weight loss and cumulative weight loss.

Conclusion:

Symbio Incision's complex chemistry allows beneficial soil moisture to be retained. Consequently, although grass growth was not maintained on these cores, Symbio believe Incision can enhance plant growth in times of drought whilst reducing the need for excessive irrigation.

"Symbio Incision maintained soil moisture at target levels throughout the very hot dry summer of 2014. Incision ensured healthy grass cover on areas which historically have been too dry to support grasses, regardless of wetting agents and intensive irrigation."

Martyn Gray | Deputy Head Keeper, Bramley Golf Club

Innovations in Dry Patch Management

SYMBIO SUPA YUCCA

COMBINED WETTING AGENT AND BIOSTIMULANT

A super concentrated natural extract derived from *Yucca schidigera* is an ideal alternative to synthetic surfactants, wetting agents and soil penetrants and is completely non-phytotoxic.

Symbio Supa Yucca breaks down the waxy coating that prevents water from entering the plant in the same way as conventional wetting agents.

Supa Yucca has a pH of 4.5 so is ideal for buffering alkaline water and may be tank mixed with compost teas to combine a biological and chemical defence against dry patch.

APPLICATION

In >600 litres water.



Pack sizes **1 litre, 5 litres**

SYMBIO HYDROAID PLUS

BUDGET WETTING AGENT AND PENETRANT FOR SPORTS PITCHES, GREENS, SURROUNDS, TEES, FAIRWAYS AND OUTFIELDS

Symbio HydroAid Plus plus is an all purpose wetting agent and penetrant designed to break down the coating, that prevents water ingress into the plant causing hydrophobic conditions. It also acts as a penetrant and encourages water to move through the rootzone in wet conditions.

Use HydroAid Plus in times of heavy rainfall to improve percolation rates.

APPLICATION

In 800 litres of water.



Pack sizes **10 litres, 200 litres**

SYMBIO AQUACEPT

A ESTABLISHED BIOLOGICAL SOLUTION TO THE HYDROPHOBIC LAYER CAUSED BY FAIRY RINGS AND FUNGAL DRY PATCH

Many turf managers experience a hydrophobic layer 4-6cm thick just below the thatch layer. It often occurs in conjunction with or near fairy rings. The hydrophobic layer is caused by organic wax and protein based hydrophobins excreted by fungi that coat the soil particles making the soil hydrophobic. The bacteria in **Symbio Aquacept** are chosen for their ability to digest the protein and waxes and out-compete the fungi for nutrient, removing the cause of the problem.

Simply activate the microbes in lukewarm water, tine to the depth of the hydrophobic layer, mix the solution with a wetting agent e.g. **Symbio Supa Yucca** and apply with enough water to get even distribution into the hydrophobic layer.

APPLICATION



Pack size **5Kg**



*Chipstead Golf Club
rootzone before and after
two years with Symbio*

"Two seasons working with a Symbio programme including compost tea and biostimulants, along with good basic greenkeeping, has transformed the profile of our greens, from thatchy, poorly drained soils to firm, disease resistant greens with vastly improved bent coverage."

Sam Bethell | Chipstead Golf Club

Problem Solving with Symbio

Disease, Fairy Rings, Root Feeding Nematodes and Dry Patch
These are all symptoms of microbially deficient soil and weak grass when non beneficial microbes have colonised your sward, thatch layer and rootzone.

SYMBIO BIO TABS

EASY, NO MESS, WAY TO PUT ESSENTIAL MICROBES IN YOUR ROOT ZONE

Simply dissolve the effervescent tablet in your spray tank. Each tablet contains enough fungi and bacteria spores to naturally treat up to 1,000m².

- Replaces Beneficial Organisms - killed by chemicals, drought, compaction and frost
- Assists repair of disease scars, fairy rings and dry patch
- Make nutrients more soluble and available to the plant
- Converts thatch to humus improving water and nutrient retention

Contains 4 species of soil fungi and 6 species of soil bacteria.

APPLICATION

1 BioTab per 1,000m² in 60-80 litres clean chlorine free water i.e. 10 BioTabs in 600-800 litres water per hectare.

Apply every 3-4 weeks during the growing season.

Pack size 20 tabs per tube

"With regular spot treatments of Symbio Fungi Booster and Aquacept, fairy rings and the associated dry patch disappeared within 14 days."

Rob Boyce | Course Manager, Links Golf Club

SYMBIO LIQUID FUNGIBOOSTER

FAST GROWING FUNGAL INOCULANT

- Accelerates recovery from fairy rings and disease
- Promotes the establishment of fescue, bent and rye grasses
- Increases active fungi to improve root mass and nutrient uptake
- Increases the plants natural defences against drought and disease stress
- Prevents fungal dry patch

Symbio FungiBooster is a unique blend of five beneficial soil fungi essential for thatch degradation and humus production, grass root growth and stress recovery. It may be applied monthly or used to spot treat affected areas.

APPLICATION

In 400-600 litres water.

Pack size 2 litres



SYMBIO PHYTOGRO 0.0.18

3 IN 1 BIOSTIMULANT, HORMONE STIMULANT AND PENETRANT WITH FOLIAR POTASSIUM.

For the prevention of dry patch and disease scarring.

- Rapidly repairs dry patch and disease scarring especially snow mould and fusarium
- Stimulates hardy spring and autumn growth, increases cell production
- Penetrant reduces dry patch and improves percolation rates in autumn

Symbio PhytoGro 0.0.18 employs a unique combination of: Fatty Acids, Fruit Acids and Vitamins, Penetrants and foliar potassium 0.0.18. The biostimulants increase cell growth and plant hormone production, wetting agents aid water penetration and dispersal and foliar potassium citrate improves photosynthesis, stomatal function and cool season growth.

Apply monthly in spring, late summer and autumn when soil temperature >6°C.

APPLICATION

In 400-600 litres of water.



Pack size 10 litres

"In less than two of years of working with Symbio, our annual meadow grass greens are changing. Large areas of perennial grass are now growing and we see a reduction in the coverage of poa annua. Fungicide use has reduced dramatically and the programme created by Symbio has put life into our soil."

Martyn Pearce | Greens Chairman, Uttoxeter Golf Club

SYMBIO ROOT REPAIR

FOR RAPID REPAIR OF NEMATODE DAMAGE AND INCREASED FROST TOLERANCE

A new biostimulant containing complex carbohydrate, chitin and amino nitrogen.

- Promotes balanced soil biology for rapid recovery from nematode damage
- Improves resistance to frost damage
- Stimulates phytoalexin production for improved stress and disease resistance
- Biostimulant for fungi, bacteria and beneficial nematodes

APPLICATION



For frost tolerance. Disease and stress resistance monthly usage.

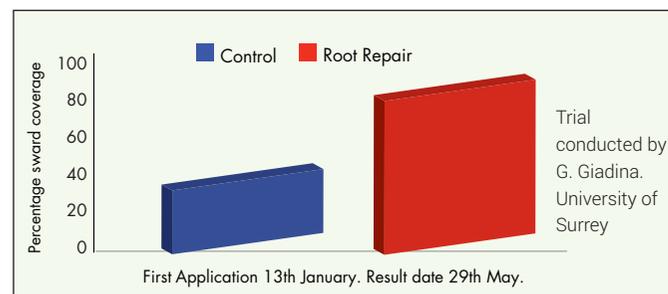
In 400-600 litres of water.

Pack size **10 litres**



To repair nematode damage use every two weeks for 3 or 4 applications.

Root repair increase in frost damaged sward coverage.



SYMBIO PHOSPHITE 7.30.11

HIGHLY CONCENTRATED LIQUID BIOSTIMULANT FOR PLANT HARDENING AND STRESS RELIEF

- Increased energy transfer within the plant
- Rapid absorption from foliar or root application
- Stimulates and supports plant defence mechanisms
- May be tank mixed with many biostimulants and fungicides
- Complements the action of calcium, magnesium and iron

Symbio Phosphite is a fast acting liquid fertiliser containing highly mobile phosphite (PO_3) molecules to increase the rate of energy transfer within the plant for increased root and shoot growth.

Phosphite may be applied as a foliar spray, tank mixed with fungicides or Fulvic Booster, or via the roots as a soil drench.

It also stimulates and supports natural plant defence mechanisms.

APPLICATION

In 200-300 litres water as a foliar spray or 400-600 litres water as a soil drench.

Pack size **10 litres**



SYMBIO DEFENDER



TURF HARDENER AND AUTUMN/WINTER BIOSTIMULANT

- Promotes stress-resistant, healthy plants
- Hardens the grass against wear and enhances disease resistance
- Used in times of stress to re-balance the trace elements within a plant

Naturally-occurring nutrients include:

- A concentrated extract of Ascophyllum nodosum seaweed harvested from the Atlantic Ocean from renewable resources, with 5% Iron and 0.3% Copper.
- Vitamins A, B1, B2, B3, B5, B12, C, D, E, K, choline and carotene.
- Bioactive amino acids including alanine, valine, glycine, isoleucine, serine, tyrosine and stress protecting amino-betaines.
- Plant hormones: auxins, gibberellins, and cytokinins.
- Essential trace elements including boron, copper, iron, magnesium, manganese, molybdenum and zinc

APPLICATION and TIMING

Use as a biostimulant year round and winter turf hardener. Apply monthly or tank mixed with biostimulants or liquid fertilisers as required.

In 300-600 litres of water.

Pack size **10 litres**



Maintenance Essentials

SYMBIO OIL REMOVER

EVERY TURF MANAGER SHOULD HAVE OIL REMOVER ON STANDBY

Oil spills are a fact of life. **Symbio Oil Remover** makes you prepared for immediate action. Simply mix Oil Remover in a bucket of water, brush or drench the affected area and the enzymatic and surfactant action will break down the oil to water soluble elements and nutrient. For use on grass and hard surfaces 1Kg treats up to 1,000m².

Pack size 1Kg



SYMBIO OIL DEGRADER

FOR LARGER SPILLS WHEN THE ROOTZONE IS CONTAMINATED WITH OIL

Powerful oil degrading bacteria convert oil to carbon dioxide and water in weeks.

Simply drench the contaminated rootzone with **Oil Degradator**, repeat weekly until the smell of oil has gone and it is safe to overseed.

Pack size 1Kg

SYMBIO RECYCLE

FOR WASH DOWN TREATMENT SYSTEMS

Symbio Recycle breaks down grass organic material, hydrocarbons, pesticides and waste found in wash down and waste water treatment systems.

- For the rapid improvement of overloaded or underperforming biological aerobic waste water treatment plants
- Facilitates the aerobic degradation of a range of grass, hydrocarbons, lignin, cellulose and general organic residues
- Improves nitrification

APPLICATION

Add to the waste water treatment system or as recommended by your technical advisor, every 7 days.



Pack size 1Kg

SYMBIO INDICATOR DYE

A NON TOXIC NATURAL VEGETABLE BLUE INDICATOR DYE, COMPATIBLE FOR TANK MIXING WITH OTHER PRODUCTS

- Highly visible, temporary pattern indicator
- Prevents overlap
- Highlights missed areas
- Identifies wind drift
- Visual guide to the efficiency of spray heads
- Compatible with fertilisers, pesticides, herbicides and fungicides
- Application rate from 25ml per 100L of mixed spray chemicals / products



APPLICATION

Symbio Indicator Dye per 100 litres of spray.

Pack size 1 litre

Tree and Plant Management

Symbio MycoForce provides all the biological support systems the plant needs to survive in its new environment and grow from day one in its new environment.

Plants grown in a nursery in sterile growing media with managed water, fertiliser and fungicide inputs often remain dormant for a year or two or even die when transplanted to the natural environment.

SYMBIO MYCORRHIZAL TRANSPLANTER

FOR CONTAINERISED AND ROOTBALLED TREES AND SHRUBS

- Improves transplant survival rate
- Accelerates growth rates
- Reduces need for fertiliser and fungicide
- Increases resistance to stress and disease

AN ENDO (VAM) AND ECTO MYCORRHIZAL INOCULANT CONTAINS

Endo Mycorrhizal species – *Glomus clarum*, *G. intraradices*, *G. mosseae*, *G. deserticola*, *G. monosporum*, *G. aggregatum*, *G. etunicatum*, *Gigaspora margarita*, *Paraglomus brassillianum*. Ecto Mycorrhizal species – *Pisolithus tinctorius*, *Rhizopogon sp.* Plus beneficial soil bacteria and fungi.

APPLICATION

Add 1g for every 1 litre of rootball size. The object is to get an even coating of mycorrhizal spores over the young feeder root system on the outside of the rootball.

Pack sizes **300g, 1Kg, 5Kg, 10Kg**



per 2-3 litre rootball



Cornus Midwinter on left treated with Symbio Mycorrhizal Transplanter

SYMBIO MYCORRHIZAL WHIPDIP

FOR BARE ROOT AND FEATHERED TREES AND SHRUBS

- Improves transplant survival rates
- Accelerates growth rates
- Reduces need for fertiliser and fungicide
- Increases resistance to stress and disease

An endo (vam) and ecto mycorrhizal inoculant for almost all* whips, bareroot trees, shrubs, seedlings, cuttings and small containerised plants. Easy to apply as a root dip just before planting.

CONTAINS

Glomus clarum, *G. intraradices*, *G. mosseae*, *G. deserticola*, *G. monosporum*, *G. aggregatum*, *G. etunicatum*, *Gigaspora margarita*, *Paraglomus brassillianum*. Ecto Mycorrhizal species – *Pisolithus tinctorius*, *Rhizopogon sp.* Plus beneficial soil bacteria and fungi. Additional sachet of swell gels. WhipDip is made into a paste with the water retaining polymers supplied.

APPLICATION

The object is to get an even coating of mycorrhizal spores over the root system. Add polymers, mix and leave for a few minutes until the mixture has the consistency of wall paper paste then dunk bare roots until coated in gel. 300g will be enough for approx 660 bare root trees or 2000 - 3000 seedlings depending on size of root. (Use less water for seedlings).

Pack sizes **300g, 1Kg, 5Kg, 10Kg**

* Endo and ecto mycorrhizal inoculants benefit most plants except ericaceous species, brassicas, orchids and some annual plants.



6-10 litres of water

Water Management

Symbio's biotechnology restores and manages healthy aquatic ecosystems at a fraction of the cost of chemical treatments and dredging.

Good water quality is essential for irrigation and the pleasant appearance of water features and lakes.

SYMBIO BLUEWATER

TREATMENT FOR PROBLEM LAKES, PONDS AND WATER FEATURES

- Prevents the growth of blanket weed and unicellular algae
- Helps to prevent green and cloudy water
- Reduces organic silt build-up
- Eliminates odour problems
- Non-chemical, safe for fish

ACTION

Symbio BlueWater is a natural formulation of bacteria, enzymes and buffers contained in a water soluble sachet. The bacteria in BlueWater use the nitrates and phosphates that feed algal growth as their own food source, starving the algae and reducing algal growth. Other bacteria break down and mineralise the organic solids from fish and waterfowl excreta and decaying plant material that results in cloudy water, sludge build-up and foul odours.



Before and after applying Symbio BlueWater

APPLICATION

Symbio BlueWater is supplied in a 200g sachet for larger lakes and ponds. The sachets are water soluble. Just throw the required number of sachets evenly around the lake.

DOSAGE

For larger water bodies: Apply 1 x 200g BlueWater sachet per 800m³ (176,000 gallons) per week through the algae growing season when water temperature is above 10°C.

For smaller water features and fishponds:

Apply 1 x 20g scoop of Symbio BlueWater Junior per 25m³. (5,500 gallons) once every 2-3 weeks.

ECOLOGY

BlueWater is harmless to aquatic life and to rooted plants. BlueWater creates a less stressful environment for fish and amphibians.

Pack size **8, 25, 50 sachet tubs**



SYMBIO BARLEY STRAW EXTRACT



- Harmless to pets
- Controls algae and filamentous algae (blanket weed)
- Accelerates the clearing of the green water
- Contains no synthetic chemicals or artificial pesticides
- Becomes effective weeks earlier than barley straw
- Harmless to fish and wildlife in ponds

APPLICATION

Symbio Barley Straw Extract should be applied initially at a dose rate of 4-5 litres per acre before dilution.

The concentrate should be added to the water body by mixing at least 1 part concentrate to 5 parts water, this is done, not directly to dilute the product, but simply to create volume thus ensuring a good initial spread across the entire area of the lake.

Pack size **25 litres**

"Using Blue Water over the last five years has enabled me to provide a much better service for my customers by keeping their ponds and lakes algae free all year. I wouldn't hesitate to recommend Blue Water to anyone."

Tim Soane | Managing Director, Clearwater plm

SYMBIO AQUABLUE

COLOURANT FOR PONDS AND LAKES

- Reduces algal growth
- Reduces the growth of submerged aquatic plants
- Complements the effects of BlueWater sachets

ACTION

Symbio AquaBlue is a highly concentrated blue vegetable dye which filters out the wave lengths of light that promote photosynthesis, this reduces algal growth whilst creating a more aesthetically pleasing water feature.

APPLICATION

AquaBlue should be added to ponds and lakes at several different locations to ensure even distribution. For smaller water features, it is advisable to pre-dilute a small volume of AquaBlue in separate container to avoid accidental overdosing. If you are unsure of water volumes or desired colour intensity, add a small volume of AquaBlue; allow to disperse and re-apply until the desired colour intensity is achieved.

DOSAGE

AquaBlue is typically applied at a rate of 1 litre per 5000m³ – 7500m³ of water (1.1 million – 1.7 million gallons). The colouration will remain for several weeks and can be topped-up as required.

Notes: AquaBlue will not stain birds or fish when used at the recommended rates although it is advisable to avoid dosing the product close to swimming waterfowl. AquaBlue will not disrupt fishing, swimming or irrigation once the product has dispersed throughout the entire water body. **AquaBlue should only be used in closed water systems.**

Pack size **1 litre**

SYMBIO LAKE SHADOW

A special blended lake colourant which creates an artificial shadow within the water to halt light from reaching the bottom, which in turn will inhibit or halt any growth of the dreaded algae.

- Works in all large ponds, lakes and fisheries
- Very economical to use
- Blocks light, denying algae's food source
- Lasts up to three months
- Free of pesticides and herbicides
- All year round use

Just 1Kg will treat 4 million litres.

APPLICATION and DOSAGE

Symbio Lake Shadow is supplied in 1Kg boxes containing 5 x 200g water soluble sachets.

Pack size **5 x 200g Sachets**

"Using Symbio Blue Water is the most effective and economic way we have found of keeping our angling lake free of blanket weed having tried all other available methods."

Tony Little | Area Parks Officer, Southend Borough Council

Remove problem blanket weed and green algae.



Analytical Services

Ensure you have the correct balance of biology, physics and chemistry for soil and plant health.

Soil, Compost and Compost Tea Analysis. Soil Food Web Analysis for Fungi, Bacteria, Mycorrhizae, Nematodes and Protozoa

Total Bacteria	Measure total bacterial biomass and compares it to optimal bacterial biomass for the grass or plant.
Active Bacteria	Measures the % of the bacteria actively metabolising organic compounds and nourishing the plant.
Total Fungi	Measure total fungal biomass and compares it to optimal fungal biomass for the grass, plant or crop.
Active Fungi	Measures the fungi currently growing and metabolising nutrient to feed the plant. Check to see if you have beneficial or pathogenic fungi.
Fungal:Bacterial Biomass	Measure the effective ratio of bacterial:fungal biomass and compares it to the ideal ratios for your plants.
Protozoa	Measures total flagellates, ciliates and amoeba. These large single celled organisms eat bacteria and excrete ammonium to feed the plant.
Nematodes	A very large group of small worms, that make nitrogen available to the plant. We count the number and identify them to genus and function.
Mycorrhizal Colonisation	Checks roots for percentage mycorrhizal colonisation.
Qualitative Analysis	A visual scan to see if bacteria, fungi, protozoa and nematodes are present in excellent, good, adequate or poor numbers.

Physico Chemical Soil Analysis

Standard Soil Analysis	pH, available phosphorus, potassium, magnesium, iron, sodium, calcium, sulphate, Cation Exchange Capacity and % Organic Matter.
Complex Soil Analysis	As above plus boron, copper, zinc, manganese.
Conductivity	Measures the total salt index in the soil.
Granulometry	Check your soil against the specifications needed for your sport or plant.

Plant Analysis

Leaf surface assay	Measures the bacteria and fungi on the leaf – an important test for disease management.
Tissue Analysis	Measures the macro and micro nutrients taken up by the plant.

Water Analysis for Irrigation, Lake, Pond and River Management

General	pH, BOD, COD, suspended solids, conductivity, hardness as calcium carbonate, turbidity, bicarbonate and alkalinity.
Nutrients	Nitrate, nitrite, organic nitrogen, ammonia, phosphate, sulphate, potassium, silicates and chloride.
Metals	Magnesium, calcium, iron, lead, zinc, cadmium, chromium, copper, nickel, barium, strontium, boron, aluminium, sodium and manganese.
Microbiological	TVC for coliforms, E.coli and faecal streptococci, salmonella, legionella.

Silt Analysis

General	Total solids, total organic carbon and dissolved organic matter plus hydrocarbons.
Nutrients	Nitrogen, phosphorus plus others as required.
Metals	Iron, lead, zinc, plus other metals if required.

Disposal

As required to determine silt disposal options.



Your Symbio technical advisor will help you decide on the analysis you need and arrange for sample collection, analysis and interpretation of the results. The results will be used to formulate a management plan to give you the results you want.

"Technical support from Symbio has been consistently excellent since I began using their products. The Sales Managers are extremely knowledgeable and have always been available to give sound advice when required."

Jason Hatton | Golf Course Manager, Arkley Golf Club

The Symbio Technical Team



Martin Ward
Managing Director

martin@symbio.co.uk
07956 898004



Gary Smith MBPR
Technical Sales Manager

gary@symbio.co.uk
07976 624241



Harry Larkins
Technical Sales Manager

harry@symbio.co.uk
07738 981570



Jeremy Hughes
Technical Sales Manager

jeremy@symbio.co.uk
07554 668423



Kerr Hunter BSc (Hons)
Business Development
Manager

UK and Ireland
kerr@symbio.co.uk
07966 786743



Laura Nelson
Technical Sales Manager

laura@symbio.co.uk
07973 712275



Neil Robinson
Technical Sales Manager

07968 344029
neil@symbio.co.uk



Mark Harper
South Wales Distributor

07786 243576
MHConsultancy06@
outlook.com



Ian Lavelle
North East Distributor

07880 614479
ianlavelle180@btinternet.com



John Quinn
Bowls Central
UK Distributor

07939 149103
Bowling Clubs
john@bowls-central.co.uk

International Distributors

Czech Republic and Slovakia ENGO, s.r.o.

Contact: Iveta Rothová
Tel: +421 335340301-3
Email: rothova@engo.sk
Mobile: + 421 903 753 841,
Tel: +421 33 59 072 51
www.engo.sk

Denmark

Contact: Gert Raeder
Tel: +45 20 42 24 86
Email: froet@froet.dk

Estonia, Latvia and Lithuania Horticom OÜ

Contact: Siiri Part
Tel: +372 517 9819,
Email: Siiri.Part@horticom.ee
Mobile: +372 651 2987
www.horticom.ee

Finland Schetelig Oy

Contact: Mika Nurminen
Tel: +358 985 20631
Email: mika.nurminen@schetelig.com
Mobile: + 358 (0)504302557
www.schetelig.com

France, Belgium and Luxembourg Fert in Time Europe SPRL/BVBA

Contact: Philippe Debougnoux
Email: debougnoux-fertintime@hotmail.com
Mobile: +32 479 36 40 84
www.fertintime.eu

Germany

Contact: Nick Simpson
Tel: + 44 (0)7555 092995
Email: nickfescue@yahoo.co.uk

Contact: Andreas Seidenfaden
Tel: + 49 (0) 1712738578
Email: aseidenfaden@t-online.de

Iceland GrasTec ehf / Ltd.

Contact: Brynjar Sæmundsson
Tel: (+354) 895 6226
Email: grastec@simnet.is

Ireland White's Agri

Contact: Jer Doran
Tel: +353 01-8438521
Email: jerdoran@whitesagri.ie
www.whitesagri.ie

Netherlands Innogreen VOF

Contact: Ruud Sniijders
Tel: +31 (0) 183 509 796
Email: sniijders@innogreen.nl
Mobile: +31 (0)610 59 7243
www.innogreen.nl

Norway PGM AS

Contact: Thomas Nicolaysen
Tel: 66 81 33 00
Email: thomas@pgm.no
Mobile: 47 (0) 66 81 33 00
www.pgm.no

Portugal Aquamatic (Algarve), Sistemas de Rega, Lda.

Contact: Paulo Gamboa
Tel: + 351 289 399 261
Email: geral@aquamaticalgarve.pt
www.aquamaticalgarve.pt

Sweden Jordelit

Contact: Thomas Johansson
Tel: 46 31 87 70 70
Email: thomas@jordelit.se
Mobile: 031-761 43 79
www.jordelit.se

Switzerland Fenaco Genossenschaft

UFA-Samen PROFI GRÜN
Tel: +41 58 433 76 76
Email: profifruen@fenaco.com
www.ufasamen.ch



SYMBIO

Unit 8, Coopers Place, Combe Lane, Wormley, Surrey GU8 5SZ

Tel: +44 (0)1428 685762 | Fax: +44 (0)1428 685702 | info@symbio.co.uk

Follow us on twitter [@symbiok](https://twitter.com/symbiok) | Like us on Facebook facebook.com/Symbio.info.uk/

www.symbio.co.uk

