SYMBO BRINGING LIFE TO YOUR SOIL

SYMBO

SPORTSTURF | LANDSCAPE | WATER
Grasses, from grazing land to cereal crops, provide a large proportion of the nutrient energy that feeds the planet. Surprisingly, almost 50% of the nutrients that grass and other plants synthesise using the sun’s energy, is released back into the soil in the form of sugary root exudates to feed and stimulate the growth of microbes – the soil living bacteria and fungi. These microbes in turn encourage healthier growth of the plant by recycling nutrients from organic matter in the soil, making these and other nutrients and water more readily available to the plant and by suppressing the activity of disease causing soil organisms.

Many turf grass management techniques override these natural processes with the excessive use of synthetic chemicals and inorganic fertilisers which can kill the beneficial soil microbes resulting in the cycle of fertiliser – water – disease – fungicide – fertiliser which is typical of sterile soil.

Symbio helps you to create a healthy living soil in intensively managed and heavily played turf by allowing you to break this cycle and by making the life in the soil work for you.
Can you afford to waste Nature's
Free nutrients
Free disease suppression
Free perennial grass promotion

All Symbio products are compatible with conventional plant management techniques and provide excellent results as part of an Integrated Pest Management (IPM) programme helping to substantially reduce conventional fungicide use.

To allow the added mycorrhiza, soil fungi and bacteria to flourish, you should reduce fertiliser and water inputs.

Symbio’s trained and highly experienced technical advisors will conduct a thorough survey of existing conditions, and work out a programme with you to solve your problems and meet your objectives to improve your sports turf. The Symbio team work closely with you to ensure success.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thatch</td>
<td>Lack of oxygen, bacteria and fungi to degrade the thatch and convert it to humus, organic acids and plant food</td>
</tr>
<tr>
<td>Disease</td>
<td>Weak grass, under stress growing in poor soil without the benefit of natural disease suppression from beneficial plant hormones, bacteria fungi and nematodes</td>
</tr>
<tr>
<td>Fairy rings &amp; dry patch</td>
<td>The predators which prevent basidiomycetes (the fungi which cause fairy rings) are too weak to stop the fairy rings from forming</td>
</tr>
<tr>
<td>Poor root growth</td>
<td>The plant is growing in sterile compacted soil</td>
</tr>
<tr>
<td>Poa annua out competes fine grasses</td>
<td>Incorrect soil conditions and management programme for fescue, bent or rye grasses</td>
</tr>
<tr>
<td>Overseeding doesn’t work</td>
<td>Incorrect ratio of fungi:bacteria, low mycorrhizal colonisation or poor physics and chemistry.</td>
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</tbody>
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Symbo Solution
Symbio analyses the rootzone to correct any chemical imbalances and provides a comprehensive nutrition, microbial and biostimulant programme to cure the problem, not just mask the symptoms.
Symbio’s Biofixation Technology Provides the Foundation for Healthy Rootzones

Symbio’s Biofixations inoculate the rootzone with the correct microbiology for strong grass growth. The Biofixation technology supports the microbial population for the entire growing season.

**SYMBIO THATCHEATER**

**GUARANTEED TO REDUCE THATCH ON ALL HEAVILY USED SPORTS TURF**

- Degrades thatch and mineralizes organic matter
- Increases turf vigour, wear, and stress resistance
- Releases nutrients for sward development, not disease
- Releases food for fungi to help promote fine grasses
- Reduces the need for hollow coring and top dressing
- Improves surface drainage and prevents black layer

*ThatchEater* is applied in spring and works for a complete season to degrade thatch and organic matter, converting it to plant food and the humus, humic and fulvic acids essential for sustainable plant growth.

Save money. Many of our customers make substantial reductions in top dressing, hollow coring, fungicide and fertiliser costs, these savings coupled with reduced surface disruption and improved playing surfaces provide greater player satisfaction and increased income and more than cover the costs of a *ThatchEater* programme.

*ThatchEater* is guaranteed 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.

“Since we started working with Symbio our thatch has nearly gone, we have converted the greens from Poa annua to predominantly fescue and reduced fertiliser inputs and fungicide applications by 4 or 5 a year. With reduced budgets, had we not been on a Symbio programme I doubt if we could have produced our greens to the exceptional condition at present.”

Andrew Shade
Head Greenkeeper, Spey Bay Golf Course

**SYMBIO GREENCIRCLE**

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

- Degrades thatch 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.

*GreenCircle* contains facultative and 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.

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

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

Pictures courtesy Bromborough Golf Club
“During 13 years working with Symbio on our USGA greens, we have developed as high a quality of fescue/bent putting surfaces as anywhere in Britain. Our greens budget including top-dressing and seed is less than £5,000. I rarely need to use fungicides, and fertiliser use is at an absolute minimum. This is ‘real sustainability.’

Howard Wood
Owner/Head Greenkeeper
Woodlake Park Golf Club

SYMBIO MYCORRHIZAL INOCULANT

FOR RAPID DEVELOPMENT AND LOWER COST MAINTENANCE OF NEWLY SEEDED OR TURVED SPORTS TURF
- May reduce grow in time by months
- Promotes establishment and longevity of perennial grasses
- Greatly improves root mass and increases nutrient uptake
- Mycorrhizal grass needs less fertiliser and water
- Mycorrhizal grass is less susceptible to and recovers faster from disease

The soil in new sand-dominated sports pitches is almost sterile. Symbio Mycorrhizal Inoculant contains 8 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.

SYMBIO RESISTER

FOR STRONG GROWTH AND DISEASE RESISTANCE IN AUTUMN AND WINTER
- Breaks down thatch which harbours disease-causing fungi
- Utilises available nutrient for microbial and turf growth
- Promotes root development and increased winter wear resistance
- Increases turf vigour and natural plant protection
- Increases fungal population to promote fine grass growth

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.

“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

A Comparison of Root Dry Weights between Mycorrhizal Inoculant and Control

Trial conducted by J Shannon – Lowe University of Surrey
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
- Retains and recycles nitrogen and other nutrients
- Rapidly decomposes thatch and turns organic matter into humus
- Produces hormones that encourage plant growth
- High biological activity in the soil and on the plant, reduces opportunities for pathogens to grow
- Introduces high levels of beneficial fungi to promote rye, fescue and bent grass over Poa annua

The Bio Brewer 620 makes enough tea for 1 – 12 hectares suitable for golf courses and larger playing fields.

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.
“We’ve been applying Compost Tea for the last five years with some very encouraging results. The brewing process and subsequent applications have undoubtedly seen a reduction in disease development and certainly enhanced both rooting depths and general aesthetics. In addition, the combination of Phytogro and Liquid Silicon have proved invaluable during the late autumn/winter months”

Rob Jackson
Course Manager Bramley Golf Club

**SYMBIO BIO BREWER 25**

**COMPLETE COMPOST TEA PACKAGE FOR USE WITH ALL COMPOST TEA BREWERS**
The Sym Bio Compost Tea Pack has been specially formulated using Sym Bio’s composting microbial technology. Each batch is tested to ensure it contains:
- Specially formulated compost, 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 plus
- A selection of plant based key nutrients and highly porous minerals to provide a protective support for the growing micro-organisms

**Fungal Additive for Compost Teas**
Many lignase producing fungi that degrade thatch do not grow in the time it takes to make a good compost tea. 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 100-500 gms per hectare to your compost tea at the beginning of the brewing cycle.

Pack size 1Kg, 5Kg

**Bacterial Additive for Compost Teas**
A mix of 16 species of soil bacteria concentrated at 2 x 10^9 CFU per gram. The bacteria are used to boost the compost tea to stimulate growth in early spring and late autumn. If you 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. Pack size 1Kg, 5Kg

**APPLICATION AND TIMING**
For soils that have been subjected to heavy inorganic fertiliser and pesticide use, apply every 7 days for the first three 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.

**Sterile v Biologically Active Rootzone**
(Trial performed by Josh Webber Portmore GC at Myerscough College)

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

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.
Mycorrhizal SeedCoat and Grass Seed

Mycorrhizal fungi are one of the most important elements for grass growth and health. They are essential for the growth of strong perennial grasses with dense roots and good disease resistance. Mycorrhizal grass requires less fertiliser and water.

In addition to healthy soil you need the correct seed to get the very best fine grasses for your playing surface. Symbio supply the DLF Johnsons range to ensure maximum performance from your turf.

SYMBIO MYCORRHIZAL SEEDCOAT AND GRASS SEED

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 8 beneficial endo mycorrhizal fungi, plus growth promoting bacteria and fungi and organic soil nutrients, to improve success when overseeding and the rapid establishment of newly seeded areas.

Mycorrhizae are essential for grass health, attaching to the roots, they can increase the surface area for nutrient and water uptake by over 300%.

“Following years of wet weather, our thatch levels had increased significantly. However since applying Symbio Liquid Seaweed 50%, Liquid Aeration and Symbio ThatchEater in combination with routine aeration we have seen greatly reduced thatch levels, increased soil friability and firmer surfaces. Fertilizer inputs have been reduced and we look forward to continued success working with Symbio.”

Neil Robinson
Head Greenkeeper, Penrith Golf Club

Bent, fescue and rye grasses rely heavily on mycorrhizae for survival in nature. In sports turf, levels of mycorrhizae are often low or non-existent due to sterile soils, compaction, pesticide and inorganic fertiliser use.

With the ever increasing price of seed it makes sense to make sure you get the maximum establishment possible. For research and trials data, contact Symbio or log on to our website www.symbio.co.uk

APPLICATION AND TIMING
Apply 3kg of Mycorrhizal SeedCoat per hectare regardless of the amount of seed used. Mix with seed in the bag or drum and sow in the usual way. The aim is to achieve even coverage of the Mycorrhizal SeedCoat across the sward using the seed as a carrier.

When a healthy mycorrhizal root touches a non mycorrhizal root, in most cases, the mycorrhizae will transfer and infect the weaker root.

Symbio is pleased to supply all Johnsons and Pro Master Range seeds precoated with Mycorrhizal SeedCoat.

Pack size 1.5Kg

Roots on left inoculated with Mycorrhizal SeedCoat. Roots on right control.

Aberdeen Football Club 4 weeks after seeding.
**Plant and Soil Nutrition**

**MycoGro Greens Grade Biological Fertilisers**

- **Promotes 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 microbiologically active root zone suffers less and recovers faster from disease**

**MycoGro Complete Biological Fertilisers**

- *Organic fertiliser, rich in humus with added mycorrhizae, soil fungi, bacteria, molasses and seaweed meal*

**SYMBIO MYCOGRO COMPLETE ORGANIC BIOLOGICAL FERTILISERS**

- Easy to spread fertilisers with mycorrhizae, soil fungi, bacteria, zeolite, molasses and seaweed meal

**SYMBIO MYCOGRO**

- Promotes 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 microbiologically active root zone suffers less and recovers faster from disease

**BIOLOGICAL ANALYSIS**

All MycoGro Organic fertilisers contain, per 20kg bag, a minimum of 15,400 spores/propagules of 8 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.

**SYMBIO MYCOGRO COMPLETE BIOLOGICAL FERTILISERS**

**SPRING and SUMMER**

- Symbio MycoGro 10.0.0 + 4% Mg with trace elements.
- Symbio MycoGro 10.0.10 + 4% Mg with trace elements.
- Symbio MycoGro 15.0.10 + 4% Mg with trace elements.

**AUTUMN, WINTER and SPRING**

- Symbio MycoGro 3.0.20 + 4% Mg 2% Fe with trace elements.
- Symbio MycoGro 5.0.28 + 4% Mg 2% Fe with trace elements.
- Symbio MycoGro 9.3.14 + 2% Mg 2% Fe.
- Symbio MycoGro 0.0.10 + 10% Mg 2% Fe 2% Mn 1% Zn 1% Cu with trace elements.

**What do the rhizo bacteria and fungi do?**

Soil bacteria and fungi are essential to:
- Convert ammonia to plant-available nitrate.
- Solubilise phosphorus.
- Degrade thatch and other organic matter, produce humus and recycle the nutrient as plant food.
- Assist nutrient uptake into the plant.
- Produce enzymes to help seed germination
- Competitively exclude harmful fungi
- Feed the nematodes and protozoa and other elements in the soil food web

**What do the Molasses & Biostimulants do?**

Our biostimulants come in different forms to:
- Provide carbon to feed all the soil microbes
- Increase the population of soil microbes
- Improve soil structure
- Increase plant photosynthesis and cell division.

**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 - 50% Organic

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

**What do Mycorrhizae do?**

Mycorrhizae are fungi that effectively 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 species to dominate *Poa annua*.

**What do we have worked with Symbio’s microbial approach over the last two years and have seen significant ingress of finer grasses and improved plant health throughout the year. We look forward to continued improvement going forward.**

Mick Buckley  Course Manager, Muskerry Golf Club
SYMBIO BIO BOOSTER LIQUID ORGANIC FERTILISERS AND BIOSTIMULANTS

Organic fertilisers have a very low salt index and combine even nutrition with biostimulants that feed the soil food web.

BioBooster Fish 8.7.7
- Made from odour free fish hydrolysate
- The most powerful biostimulant you can apply
- Promotes growth when grass is heat, cold and drought stressed

BioBooster Carbohydrate based Organic Liquids 15.1.1 – 7.2.2 – 6.2.4 – 3.0.8
- Rich in sugars and carbohydrates
- Contain both Macro and Micronutrients
- High sticker/wetter activity and organic matter content gives long lasting effect
- Multiple applications promote improved soil structure and root growth

BioBooster Liquid Organic fertilisers are ideal for use with high conductivity irrigation water sources. They repair the salt stress in growing media caused by the long-term use of inorganic fertilisers and poor irrigation water quality. May be mixed with compost teas.

Pack sizes 10 litres, 200 litres, 1,000 litres

SYMBIO LIQUID FERTILISERS + SEAWEED, HUMIC ACID AND TRACE ELEMENTS

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

20.0.10 - 16.3.10 - 15.0.0.+5Ca - 15.0.10 - 10.0.20 - 12.0.12 - 1.0.15 - 3.0.20 - 0.0.16 and 3.0.10+3Mg all with essential trace elements.

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

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

Pack size 20Kg

SYMBIO MYCOGRO TEE, PITCH, LAWN AND FAIRWAY FERTILISERS

Contain Thatch Eating Fungi and Bacteria

12.2.9 50% Organic
6.2.18 50% Organic
20.0.10 50% SCU Slow release
7.0.10 with extra thatch eating fungi
15.2.15 25% UMAXX slow release

- 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

Pack size 20Kg
**SYMBO SYMBIO CMS SHOOT 5.0.2**

**For the earliest start to Spring growth**

Contains 9.2% amino acids w/w. 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 total fertiliser for greens, pitches, fairways and lawns 30 - 50 litres per hectare.

As a biostimulant for golf greens and other grass swards 10 - 20 litres per hectare.

**NUTRIENT CONTENT**

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

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

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**SYMBO SYMBIO CAVIAR 10.0.4 WITH 25% FULVIC ACID ORGANIC FERTILISER FOR FAIRWAYS AND SPORTS PITCHES**

A 10-0-4 low salt index organic granule combining slow release nutrients, with organic matter 45% – fulvic acid 25% – amino acids 15% with excellent biostimulant and soil building properties.

- Easy to spread organically sourced slow release fertiliser – 2mm granules
- Manufactured from Soluble Condensed Molasses
- 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

**CONTAINS**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Content</th>
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<tbody>
<tr>
<td>Nitrogen</td>
<td>10%</td>
</tr>
<tr>
<td>Phosphorus</td>
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<tr>
<td>Potassium</td>
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<td>Zinc</td>
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<tr>
<td>Humic Acid</td>
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<tr>
<td>Fulvic Acid</td>
<td>25%</td>
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<tr>
<td>Amino Acids</td>
<td>15%</td>
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</table>

Pack sizes **20Kg bag, 500Kg big bag**
**BIOSTIMULANTS**

Biostimulants play a very important role by feeding the life in the soil that recycles and retains nutrients and degrades thatch. Many biostimulants directly improve the plant’s metabolism and increase plant hormone activity to strengthen the plant against stress and disease. Not all biostimulants are the same, so use the following guide or contact your Symbio advisor to get the best results.

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**SYMBIO FULVIC BOOSTER**

**COOL SEASON GROWTH PROMOTER AND CHELATING AGENT**

Apply in Spring and Autumn

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**

To promote early and late season growth apply at 10 litres per hectare. To maintain results apply at 2.5-5 litres through the summer. To chelate liquid fertilisers and improve fungicide uptake: 5 litres per hectare tank mixed. To mix with organic fertilisers and compost teas: 2 litres per hectare.

Pack size **10 litres**

Also available as a soluble powder at 80% concentration

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**SYMBIO LIQUID SEAWEED**

**CONCENTRATED 50% SOLID MATTER**

Apply throughout the growing season

A super concentrated Liquid Seaweed with 50% solid content, 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**

10-20 litres in 400-800 litres of water per hectare.

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

Pack size **20 litres**
“In May significant root knot nematode damage was evident. We applied 3 applications of Root Repair which restored root growth and increased root depth.”

Brett Cox
Course Manager, Welwyn Garden City Golf Club

SYMBIO HUMIC BOOSTER

FUNGAL BIOSTIMULANT AND CHELATING AGENT

Apply throughout the growing season

The essential biostimulant for perennial grass growth in sandy rootzones with available humic and fulvic acids.

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

Humic Booster can be applied as a foliar feed or soil drench via irrigation systems or spray tank and mixed with all Symbio products plus liquid fertilisers.

APPLICATION
Soluble 1-5 kilos dissolved in 400+ litres per hectare per hectare.

Liquid 10-20 litres in 400+ litres per hectare.

Pack size soluble 10Kg, 25Kg sack or liquid 10 litres

SYMBIO SILICON

RAPIDLY AVAILABLE POTASSIUM SILICATE K₂O 12% SiO₂ 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 photo synthesis

APPLICATION
5 litres per hectare in 300 to 600 litres of water. To increase ball roll or green speed apply 4-7 days before competition.

Pack size 5 litres
SYMBIO INCISION

A new 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 is a combination of surfactant technology to ensure even distribution of water through the rootzone with polymers to hold the water in a thin film around the soil particle to ensure the all-important airspace between soil particles is maintained.

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. 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, cutting quickly though the profile to the hydrophobic layer.

Pack size 10 litres

SYMBIO SUPA YUCCA WETTING AGENT

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

Pack sizes 1 litre, 5 litres, 10 litres

SYMBIO HYDROAID PLUS

Budget wetting agent for fairways, tees, surrounds and outfields

For severe dry patch, when an immediate response is necessary, we recommend HydroAid Plus, a powerful non-ionic surfactant that will quickly remove the natural waxes and proteins that cause hydrophobic conditions, allowing water to penetrate the root zone. It may be tank mixed with most non microbial liquids.

Pack sizes 2 x 5 litres, 200 litres

SYMBIO AQUACEPT

A cure for the hydrophobic (water repellent) layer caused by 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 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.

Pack size 10 litres
SYMBIO TRACEOLITE

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

- 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. Apply 1-10 tonnes per hectare.

To firm and dry wet playing surfaces. Apply 2-10 tonnes per hectare, either via tine holes or mixed with top dressing.

NUTRIENT CONTENT
P2O5 3.1%; K2O 2.9%; FeO 10%; MgO 5.4%; CaO 5.5%; MnO 1.0%; S03 2.5%; TiO 1.5%; Al2O3 13.0%; SiO2 41.5% Cu 250ppm; Mo 120ppm; Zn 190ppm. pH 6.8.

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 effected area and the enzymatic and surfacant action will break down the oil to water soluble elements and nutrient. For use on grass and hard surfaces 1 Kg treats up to 1,000m².

OIL SPILL MANAGEMENT

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 Degradar, repeat weekly until the smell of oil has gone and it is safe to overseed.
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
2.5L – 5L per hectare in 400-600 litres of water. 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.

Pack sizes 1 litre, 5 litres

Improved rootzone friability and water retention

<table>
<thead>
<tr>
<th>Mean soil moisture % water content</th>
<th>Control</th>
<th>2.5 L/Ha</th>
<th>5 L/Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial readings 15th May 2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 weeks after application</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5L/Ha</td>
<td>44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“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
**Problem solving with Symbio**

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

Symbio helps you create a supportive natural environment for fine grass. Symbio does not supply pesticides but develops an active soil food web that defends the grass against disease and drought stress. By creating healthy soil as part of an IPM programme you will substantially reduce the need for pesticides.

**SYM BIO LIQUID FUNGIBOOSTER**

Liquid 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

Fungi Booster 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.

Pack size 2 litres

“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

**DISEASE AND DRY PATCH PREVENTION AND REPAIR**

**SYM BIO PHYTOGRO**

Biostimulant, Hormone Stimulant, Wetting Agent 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
- May be used as a treatment or a preventative

Symbio PhytoGro employs a unique combination of: Fatty Acids, Fruit Acids and Vitamins wetting agent/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

**APPLICATION AND TIMING**

PhytoGro has no fungicidal properties and only works on growing grass. It may be applied at any time soil temperature is above 6°C. For best results apply monthly from late summer until the grass stops growing and as soon as the soil temperature goes above 6°C in spring.

Pack size 2 x 10 litres
Symbio Phosphite NPK 7.30.11

Highly concentrated liquid fertiliser for plant hardening and stress relief

- Rapidly available source of phosphate, especially in mycorrhizal plants
- 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 (PO₃) molecules, rather than the usual phosphate (PO₄). Its effect is to increase the rate of energy transfer within the plant, resulting in increased root and shoot growth.

Phosphate is highly mobile and may be applied as a foliar spray, tank mixed with fungicides or Fulvic Booster or via the roots via soil application.

It also stimulates and supports natural plant defence mechanisms because natural phytoalexin production is maximised when ideal nutrition is provided.

APPLICATION RATE
5-10 litres of Symbio Phosphite in 200-300 litres water as a foliar spray or 400-600 litres water as a soil drench.

Root Repair increase in frost damaged sward coverage

Trial conducted by G. Giadina. University of Surrey
“After the winter Green Circle gives the soil a kick start. Since applying it, the soil profiles have become much cleaner and obviously healthier. This in turn has led to fewer fertiliser and fungicide applications. The savings made more than compensate for the initial cost and I see Green Circle as a vital component in my management regime.”

Jeff Foulger
Course Manager, Pinner Hill Golf Club

“We’ve had great success with Symbio over many years on our fescue links greens which hardly ever get fed! We have also not used a fungicide for years.”

Billy Mitchell
Head Greenkeeper, Perranporth Golf Club

“Before we used Symbio our parkland greens were very poor in all aspects. After 7 years with Symbio, using their ‘sustainable approach’ for quality turf, the greens are continuously in very good condition despite the huge amount of rounds played. We now have bent dominated swards that are improving rapidly all the time”

Les Pearce
Head Greenkeeper, The Parc Golf Club
Biological treatment for problem lakes and ponds

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

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

**SYMBIO BLUEWATER**

**TREATMENT FOR PROBLEM LAKES, PONDS & 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.

**APPLICATION**

Symbio BlueWater is supplied in a 225gm 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 225gms 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 25gms sachet 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.

**SYMBIO AQUABLUE**

**Colours 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.
“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

SYMBIO BIOFILTERS

Nutrient stripping and pollution control filters for flowing water, recycling systems, waste treatment plants, inlet streams, reed beds and irrigation water.

Removes algae from feeder streams.
Reduces organic pollution, nitrate and phosphate in lakes and irrigation water.

ACTION
SYMBIO BIOFILTERS contain bacteria fixed to a porous substrate that work by metabolising or removing the pollutants in flowing water. They degrade organic matter e.g. hydrocarbons, phenols, animal waste and also remove heavy metal ions from the water.

APPLICATION
SYMBIO BIOFILTERS can be installed easily in and across water channels, or the filter media can be used to replace existing filter media in all systems, which do not rely on UV after filtration.

DOSEAGE
Dosage and application is calculated on a case-by-case basis by Symbio’s technical service team, following analysis of the problem to be solved and the customer’s requirements.

“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 LAGOON

Restores polluted lakes and lagoons

- Restoration of neglected ponds and lakes.
- Restoration of surface waters after oil or chemical spills.
- Non Invasive organic silt reduction in heavily silted lakes.

ACTION
The microbes fixed in Symbio Lagoon degrade organic silt, and pollutants and utilise available nitrate and phosphate preventing growth of algae and blanket weed.

APPLICATION
Symbio Lagoon is applied direct to the water, silt or sludge.

DOSEAGE
Lagoon is usually dosed at a rate of 3-5 tonnes per hectare, depending on the problem to be treated. The bioremediation programme is determined after analysis of the silt and water by Symbio’s technical team.

Remove problem blanket weed and green algae.
APPLICATIO N RATE
The object is to get an even coating of mycorrhizal spores over the root system. Add one 300 g sachet of MycoForce to 6-10 litres of water, 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. 300 gms will be enough for approx 660 bare root trees or 2000 - 3000 seedlings depending on size of root. (Use less water for seedlings)

M YCOFORCE
MYCORRHIZAL STRESS SAVER
I Arrests decline for trees suffering from compaction, salt damage and drought
I Accelerates growth rates
I Reduces need for fertiliser and fungicide
I Increases resistance to stress and disease

AN INJECTABLE ECTO & ENDO MYCORRHIZAL INOCULANT WITH ROOT GROWTH PROMOTERS FOR MATURE TREES SUFFERING STRESS OR IN DECLINE.

APPLICATION RATE
1.5 gms per 1 sqm of canopy cover. Apply under the canopy at least to the edge of the drip line. Mix 1 300gms bag with 200 litres to 400 litres of water and apply by pressure injection machine at no more than 200 psi (12 bar) or via soil corer or auger into the upper 20 – 50cms of root zone. Apply at about 1 metre centres for large trees with a canopy over 100m² and 0.5 metre centres for smaller trees. If using a soil compaction reducer, relieve compaction first then apply MycoForce Stress Saver. Keep mix agitated during application, as it is not readily soluble. May be mixed with HumicBooster, Liquid Seaweed and MycoPower.

FOR BEST RESULTS
Transplant into a soil or mulch high in organic matter. Mycorrhizal plants do not need heavy applications of fertiliser. (See MycoForce fertilisers) Herbicides and insecticides which do not harm the plant, do not interfere with mycorrhizal fungal development.

SPECIES COMPATABILITY
*All trees and shrubs except Rhododendrons, Laurels, Azaleas and Ericaceous species.

Pack sizes 1 x 300g sachet 10 X 300g per box. 1kg, 5kg tub, 10kg tub

SYM BIO MYCORRHIZAL TRANSPLAN TER
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

APPLICATION
3gms per 2-3 litre rootball then add 1gm for every extra 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.

SYM BIO 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

SYM BIO 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

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.

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.
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

**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**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Bacteria</td>
<td>Measure total bacterial biomass and compares it to optimal bacterial biomass for the grass or plant.</td>
</tr>
<tr>
<td>Active Bacteria</td>
<td>Measures the % of the bacteria actively metabolising organic compounds and nourishing the plant.</td>
</tr>
<tr>
<td>Total Fungi</td>
<td>Measure total fungal biomass and compares it to optimal fungal biomass for the grass, plant or crop.</td>
</tr>
<tr>
<td>Active Fungi</td>
<td>Measures the fungi currently growing and metabolising nutrient to feed the plant. Check to see if you have beneficial or pathogenic fungi.</td>
</tr>
<tr>
<td>Fungal:Bacterial Biomass</td>
<td>Measure the effective ratio of bacterial:fungal biomass and compares it to the ideal ratios for your plants.</td>
</tr>
<tr>
<td>Protozoa</td>
<td>Measures total flagellates, ciliates and amoeba. These large single celled organisms eat bacteria and excrete ammonium to feed the plant.</td>
</tr>
<tr>
<td>Nematodes</td>
<td>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.</td>
</tr>
<tr>
<td>Mycorrhizal Colonisation</td>
<td>Checks roots for percentage mycorrhizal colonisation.</td>
</tr>
<tr>
<td>Qualitative Analysis</td>
<td>A visual scan to see if bacteria, fungi, protozoa and nematodes are present in excellent, good, adequate or poor numbers.</td>
</tr>
</tbody>
</table>

**Physico Chemical Soil Analysis**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex Soil Analysis</td>
<td>As above plus boron, copper, zinc, manganese.</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Measures the total salt index in the soil.</td>
</tr>
<tr>
<td>Granulometry</td>
<td>Check your soil against the specifications needed for your sport or plant.</td>
</tr>
</tbody>
</table>

**Plant Analysis**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf surface assay</td>
<td>Measures the bacteria and fungi on the leaf – an important test for disease management.</td>
</tr>
<tr>
<td>Tissue Analysis</td>
<td>Measures the macro and micro nutrients taken up by the plant.</td>
</tr>
</tbody>
</table>

**Water Analysis for Irrigation, Lake, Pond and River Management**

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

**Silt Analysis**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Total solids, total organic carbon and dissolved organic matter plus hydrocarbons.</td>
</tr>
<tr>
<td>Nutrients</td>
<td>Nitrogen, phosphorus plus others as required</td>
</tr>
<tr>
<td>Metals</td>
<td>Iron, lead, zinc, plus other metals if required.</td>
</tr>
<tr>
<td>Disposal</td>
<td>As required to determine silt disposal options</td>
</tr>
</tbody>
</table>