

Angus BioActive Products

Angus Horticulture have been at the forefront of the move to natural turf management and now have many years of experience in formulating, producing and using what we now call **Angus BioActive Products**. While not advocating the complete suspension of chemical nutrients we do believe, and indeed have proved, that it is possible to significantly reduce chemical inputs and in particular fungicides are frequently not required at all.

Using **Angus BioActive Products** as part of a planned programme for grass management enables sports turf managers to improve sward quality, plant health, playing surface and establishment of newly seeded areas. The range of products is now selling throughout Europe and word of mouth is promoting continually increased sales for this outstanding range of products.

Working with nature, encouraging natural biology to develop and thrive is where **Angus BioActive Products** work best. Once developing these fungal and bacterial colonies it's important to protect and nurture this natural life that so improves our root zones, plant health and nutrient availability. Angus Horticulture produce a range of reduced and low salt fertilisers that ensure the best possible outcome for plant and microbial life.

The next few pages (p.27 – 39) of the brochure detail **Angus BioActive Products** and pages 14 -20 feature our reduced and low salt **BioActive ProloNg™** (mini & 2-4mm) and **Turf Rise MU** fertilisers.

BioActive TE

A blend of chelated trace elements complexed with carbohydrates and humates. Using natural chelating compounds ensures these important trace elements are efficiently available to the plant. Often overlooked, trace elements (micro nutrients) are essential to all plants and providing a proportional balance of each of these nutrients will:

- Enhance plant colour
- Help maintain plant health
- Improve disease resistance and stress tolerance
- Increase rooting and aid establishment of new turf grass surfaces
- Provide necessary nutrient for plant auxin and enzyme production and metabolism
- Prevents harmful side effects caused by micro nutrient deficiencies

BioActive TE

Blend of chelated trace elements complexed with carbohydrates and humates

Contains proportionate levels of:

Boron (B), Copper (Cu), Iron (Fe), Manganese (Mn), Zinc (Zn)

And traces of:

Calcium (Ca), Molybdenum (Mo) and Sulphur (S)

As well as:

0.3% Potassium (K), carbohydrates, humic & fulvic acid and seaweed

Application rates:

20 - 40 litres / ha in 300 - 500 litres of water

Apply when required

Available in 10 litre containers

best quality, best service, best value



BioActive Invigo™

This homogenized blend of plant extracts provides a superb organic based feed for all grass surfaces with the added advantage of the inclusion of iron (Fe) complexed with carbohydrates and humates. Formulated with more than 95% organic or natural raw materials, providing both readily available and slow release macro and secondary nutrients.

- Improves turf density, root density and enhances plant colour
- Enhanced plant uptake of all major nutrients for strong plant growth
- Encourages healthy microbiology in the turf root zone environment
- Improves disease resistance & stress tolerance
- Fast recovery times
- Low salt formulation
- Safe & ideal for regular application throughout the growing season

BioActive Invigo™

Contains (w/v):

7-2-3 + TE, humates & carbohydrates

7% Nitrogen (N), 2% Phosphorus Pentoxide (P₂O₅), 3% Potassium (K₂O), 0.12% Magnesium Oxide (MgO), 0.73% Calcium Oxide (CaO), 0.94% Sulphur Trioxide (SO₃), 0.01% Iron (Fe)

As well as:

Carbohydrates (25% sugars), humic & fulvic acid (>2.4% humic substances)

Application rates:

50 - 150 litres / ha in 300 - 500 litres of water

Nutrients supplied per m² @ 75lt/ha:

0.525g N, 0.15g P₂O₅, 0.225g K₂O + 0.07g MgO + 0.05g CaO + 0.07g SO₃

Available in 10, 200 & 1,000 litre containers

SG: 1.32

best quality, best service, best value





BioActive MolTurf®

Concentrated Carbohydrates

Faster playing surfaces, increased stress resistance & recovery

BioActive MolTurf® is our award winning liquid carbohydrate. **BioActive MolTurf®** contains naturally sourced carbohydrates and trace elements that energise the turf grass plant metabolism and stimulates microbial activity around the root and leaves. **BioActive MolTurf®** is a natural carbon balancer that increases the efficiency of nitrogen utilisation allowing less nitrogen to be applied. **BioActive MolTurf®** provides a quickly available carbon food source for microbes that live around turf grass roots, thus helping to reduce fungicide and fertiliser applications. Use on all turf grass surfaces and root zones for faster playing surfaces.

Main benefits of **BioActive MolTurf®** on turf grass surfaces:

- **Faster and improved playing surface**
- **Promotes the availability and ready uptake of mineral nutrients**
- **Reduced applications of fertilisers**
- **Increased ability to resist and recover from environmental stresses, e.g. freezing temperatures, extended heat etc.**
- **Reduced disease susceptibility**
- **Regular use can result in less nematode damage**
- **Helps to reduce thatch build up by improving the efficiency and recycling of nitrogen and carbon by soil microbes**
- **Contains useful levels of furfural (typically 50mg/kg), high in sugars (> 40%)**



Application guidelines:

10 - 20 litres/ha when tank mixed with **BioActive Invigo™** and/or with **Angus BioActive Seaweed** in 300 - 400 litres of water

20 - 30 litres/ha when used on its own in 500 - 600 litres of water

Apply every 2-3 weeks during March and April and before the first fertiliser application, and during September and October after autumn renovations.

Apply once per month during summer and winter months.

Available in 10 litre containers

best quality, best service, best value



Angus BioActive Seaweed

This concentrated liquid seaweed extract derived from *Ascophyllum nodosum* without the use of chemicals is an industry leader. A great source of plant nutrients and organic carbon, **Angus BioActive Seaweed** promotes strong & vigorous growth, excellent root development as well as increasing the plants ability to withstand pressure from disease and environmental stresses.

- Promotes strong root development
- Improves plants tolerance to environmental and biological stresses
- Encourages activity of beneficial microbes
- Results in stronger & healthier plants
- Concentrated natural formulation for best results
- Low application rates for greater affordability
- Increases plant vigour

Angus BioActive Seaweed 30% solids

Typical analysis (w/v): 0.58% Nitrogen (N), 0.29% Phosphorus Pentoxide (P₂O₅), 1.02% Potassium (K₂O),

As well as: boron (B), copper (Cu), iron (Fe), magnesium (Mg), manganese (Mn), molybdenum (Mo), zinc (Zn)

And: alginates, amino acids, auxins, cytokinins, gibberellins, vitamins, betaines, fucoidan, laminarin, mannitol

Application rates: 3 - 5 litres / ha in 300 - 500 litres of water

Alginates (>24% content typically) improve soil structure; increasing humates, forming crumb structure, increasing soil aeration & aerobic bacteria, increases moisture retention. With mannitol (>10% content typically) a carbohydrate, trace elements (present in seaweed and the soil) are chelated and made available to plants. **Amino acids** (alanine, valine, glycine, isoleucine, serine, tyrosine & stress protecting amino-betaines); these Natural L-isomers are used by plants directly in the production of proteins. **Auxins** (>90 ppm content typically), plant hormones are essential for plant body development, enabling a plant to react to external conditions. Auxins stimulate cell elongation & promote root initiation. **Cytokinins** (>285 ppm content typically) promote cell division and plant growth. **Gibberellins** (>150 ppm content typically) regulate plant growth & enzyme production, breaking dormancy and stimulating cell elongation causing plants to grow taller. **Vitamins:** A, B1, B2, B3, B5, B12, C, D, E, K, choline & carotene. **Betaines** (>0.04% content typically) aid plants to cope with stresses such as cold, heat, water deficient or high salt conditions and increases the tolerance of plants to abiotic stress. **Fucoidan** (>8% content typically) provides plant protection in strong sunlight and harsh environments. **Laminarin** (>20% content typically) accelerates seed germination and plant growth and elicits defense response in plants reducing infection of the plant by various diseases. **Mannitol** (>10% content typically) increases trace element availability, increases a plants tolerance to salt and osmotic stress and has a role in a plants response to attack from pathogens; reducing biotic & abiotic stresses. Mannitol decomposes readily & unlike cellulose, doesn't immobilise Nitrogen.

Available in 10 litre containers

best quality, best service, best value



BioActive FerroCarb™

Concentrated liquid iron with carbohydrates

Environmentally safe formulation of liquid iron and natural carbohydrates

BioActive FerroCarb™ is a blend of carbohydrate extracts, amino acids, and iron in a true solution formulation. **BioActive FerroCarb™** contains our unique blend of carbohydrates, amino acids and proteins for more effective penetration into the turf grass plant and utilisation in making chlorophyll molecules, and enhanced rooting and plant health. **BioActive FerroCarb™** reduces moss formation, provides aesthetic greening up, and blends with all liquid products in the BioActive range. **BioActive FerroCarb™** does not scorch turf grass leaves nor does it harm soil microbes when used at recommended rates. **BioActive FerroCarb™** is ecologically safe and an effective green-up formulation for turf grass surfaces.

Applying **BioActive FerroCarb™** outperforms straight ferrous sulphate

Main benefits of **BioActive FerroCarb™** on turf grass surfaces:

- Great colour for aesthetic appeal
- Safe for soil microbes
- Reduces moss formation
- Enhanced rooting
- Replaces the need for harmful Ferrous Sulphate
- Easily tank mixed and applied with other treatments in the BioActive range



Application guidelines;

Apply 20 - 40 litres per hectare diluted in 400 litres of water as required

Do not tank mix where instructions for other manufacturer's product(s) advise **against** use with stickers, wetters or other adjuvants.

Available in 10 litre containers

best quality, best service, best value



BioActive Maxim™

High concentration liquid humic and fulvic acids

Increases CEC of sand root zones and improves fertiliser longevity

BioActive Maxim™ is made from naturally occurring organic substances that come from a mix of microbial action on plants and ancient deposits of plant origin. **BioActive Maxim™** is a plant stimulant and soil amendment and should always be used as part of a standard fertility program to improve nutrient retention in the root zone and utilisation by plants. **BioActive Maxim™** is an easy spray formulation and is a simple and effective way of improving root zones by detoxifying pesticide and heavy metal residues.

The high-molecular weight humic substances in **BioActive Maxim™** alter the physical characteristics of root zones. Humates influence soil fertility through its effect on the physical, chemical, and biological properties of the soil and can also act as a buffer by preventing rapid changes in root zone pH.

The low-molecular weight humic substance, fulvic acids and fulvates, are involved in chemical reactions in the soil. Microorganisms are needed in the soil to create fulvic acids and make important contributions to stimulating plant metabolism leading to greatly improved plant growth and micronutrient uptake.

Benefits of **BioActive Maxim™**:

- Remediation of salt affected turf grass surfaces
- Assistance in seed germination and growth
- Improved development of roots and shoots
- Resistance of plants to fungal attack
- Enhanced uptake of nutrients
- Stimulation of plant metabolism
- Increased drought tolerance
- Participation in synthesis of new minerals



Application guidelines

When tank mixing we strongly recommend a simple 'bucket test' prior to application in order to confirm compatibility.

Spray at 20 - 40 litres/ha in 200 - 400 litres of water
Apply three times per year on soil-based root zones
Apply four to six times per year on sand based root zones

*Available in 10 litre containers
best quality, best service, best value*



BioActive CT Activators

Compost Teas have been used for many years throughout the world and with significant benefits when brewed and used with education and understanding. Angus Horticulture is pleased to encourage this use of natural biology and by using **Angus BioActive CT Activators** turf managers can easily produce high quality and economical compost teas.

- **Boost natural microbial content in root zones**
- **Increasing root mass**
- **Reduce damage from disease**
- **Enhanced nutrient assimilation by the plant**
- **Maintain healthy microbiology in the turf root zone environment**
- **Improves disease resistance & stress tolerance**
- **Safe & ideal for regular application throughout the growing season**
- **Improves soil / root zone structure**

In order to get the best from any compost tea brew, it's important to add to the mix ingredients that encourage the specific type of biology that you're looking to mobilise; that's what **Angus BioActive CT Activators** facilitate. We advocate using compost from your own site (the best is often found under trees) where local strains (rather than imported foreign strains) of beneficial fungi & bacteria are likely to be the best for your environment. Where this isn't available Angus Horticulture can supply a high quality VermiCompost. With compost in the brewer, then choose a fungal or bacterial brew and add the required CT Activator.

CT Activator Fungal

A probiotic blend of humates, amino acids and plant extract proteins formulated to encourage the activity and increase of beneficial fungi

Application rates: Up to 500 litres of compost tea, use 1 litre of **BioActive CT Activator**
500 – 1,000 litres of compost tea, use 2 litres of **BioActive CT Activator**

CT Activator Bacterial

A probiotic blend of mainly plant extract carbon & hydrogen formulated to encourage the activity and multiplication of beneficial bacteria

Application rates: Up to 500 litres of compost tea, use 1 litre of **BioActive CT Activator**
500 – 1,000 litres of compost tea, use 2 litres of **BioActive CT Activator**

Available in 2 litre containers (12x 2 litres / outer)

best quality, best service, best value



BioActive Express™

Efficient phosphorus with plant extracts: 4-25-9 w/w

Enhances establishment of new turf grass surfaces from seed

BioActive Express™ is a unique bio-stimulant for use in all turf grass surfaces to maximise early plant growth, particularly in new golf course and sports pitch constructions. By encouraging stronger root systems and more effective symbiotic relationships with soil biology the plant's nutrient gathering abilities are enhanced. As a result plants make more effective and economic use of all available and locked up resources reducing dependence on applied fertilisers. In addition, **BioActive Express™** will enhance the plant's own defence mechanisms by enabling the plant to produce phytoalexins more effectively, complementing and improving disease control programmes.

Main Benefits of **BioActive Express™**:

- Aids the rapid establishment of newly germinated turf grass seed
- Maximises root development, enhancing nutrient uptake and utilisation
- Encourages the development of strong plant structures
- Enhances plant health, complementing disease control programmes
- Maintains green leaf retention to maximise turf grass development and maturity



Application guidelines:

Compatible in tank mix with a wide range of herbicides, fungicides and insecticides. **Do not tank mix** where instructions for partner product(s) advise against use with stickers, wetters or other adjuvants. Always read the label and that of partner product(s) and if in doubt consult your Angus BioActive advisor/distributor. Unless circumstances dictate do not apply more than three times during a growing season.

Rate: 2 litres/ha on new turf grass seedlings
4 litres/ha on mature turf grass surfaces
Mix with 200 - 400 litres of water per hectare

Available in 10 litre containers

best quality, best service, best value



BioActive Infiltrate™ Yucca Extract

Organic wetter and anti-stress agent

BioActive Infiltrate™ is a natural plant extract containing surface tension breaking saponins. It improves water spread and penetration, and alleviates stress conditions. By affecting water movement and uptake in the root zone it also improves nutrient absorption. **BioActive Infiltrate™** is a natural biostimulant, which increases biological activity in the soil and stimulates plant growth and development.

Why choose BioActive Infiltrate™?

Because it is a natural wetter Yucca Extract can be applied as foliar spray or drenched via irrigation system to:

- Improve water and fertiliser penetration
- Soften hard, compacted soils
- Reduce surface tension of foliar sprays
- Improve uptake of foliar feeds and trace elements
- Improve performance of pesticides
- Improve seed germination

BioActive Infiltrate™ is particularly useful in helping plants to overcome high stress conditions such as:

- Excessive wear
- Insufficient water availability through poor penetration or excess percolation
- High alkaline or acidity
- Temperature extremes
- Drought

BioActive Infiltrate™ Yucca Extract Organic wetting agent for use on amenity turf

Application rates:

High volume application 3 litres / ha in irrigation water applied @ fortnightly intervals while required

Foliar application 100ml / 100 litres of spray solution with other foliar sprays

Available in 5 & 10 litre bottles

We cannot predict or guarantee tank mix success for any product; always conduct a bucket test to confirm compatibility.



best quality, best service, best value



BioActive RZ™

Balanced consortium of mycorrhizae fungi

Increased mineral nutrient uptake, pest & disease resistance, increased plant stress tolerance

BioActive RZ™ combines beneficial microbes with a vegetable based source of continuous release micro-nutrients, trace minerals, fulvic and humic acids. **BioActive RZ™** is carefully graded to ensure each particle contributes to the retention of moisture and nutrients in the soil. Mycorrhizae establish a symbiotic relationship with turf grass roots and a strong establishment results in mycorrhizae taking up nutrients from a far greater area than roots can reach. Mycorrhizae function in low pH environments and nutrient uptake is not affected by pH fluctuations in sand root zones. Mycorrhizae also provide a barrier to soil pests, e.g. nematodes, and help to control this important pest through their own defence capabilities.

Benefits of **BioActive RZ™**:

- **Applied nutrients are used more efficiently, particularly in low pH root zones**
- **Enables turf roots to make better use of water**
- **Protection from pest & disease attack**
- **Increased establishment of new turf grass surfaces**
- **Increase plant stress tolerance & recovery**
- **Increased root mass and plant growth rates**



Application Guidelines

Pre-seeding or laying new turf – apply at 1 - 2 tonnes per hectare to seed-bed before final preparation for sowing or laying turf

Established turf – apply at 0.5 - 1 tonne per hectare after aeration

Available in 20kg bags & 1,000kg bulk bags

best quality, best service, best value



BioActive Magnet™

High quality clinoptilolite

Retention of nutrients & water and buffering of pH in sand-based root zones

BioActive Magnet™ is a high quality clinoptilolite processed from volcanic material that also contains potassium and magnesium nutrients. **BioActive Magnet™** increases nutrient retention and reduces fertilizer requirements in the root zone by increasing the Cation Exchange Capacity (CEC) and establishing a replenishable and balanced nutrient supply. The attached nutrients in **BioActive Magnet™** attract soil microbes which use the substrate to feed on, and high microbial populations are rapidly established. **BioActive Magnet™** is ideal for use in combination with *Compost Tea*. Moisture retention is also increased because of the porous structure of the material. **BioActive Magnet™** maintains and improves the ability of the root zone to drain, provide aeration and to withstand intense traffic.

BioActive Magnet™, applied either by top dressing to existing turf grass surfaces, or used as an amendment on new constructions, has the following benefits;

- Helps to establish soil microbe populations
- Absorption of soluble nitrogen and potassium leads to reduced leaching of key nutrients into waterways
- A high ion-exchange capability helps to save on fertilizer costs
- Porous granules increase soil aeration resulting in healthier turf
- Improves seed germination rates
- Robust granules resist soil compaction



In addition, the use of **BioActive Magnet™** as a perch layer on top of course backfill when installing drainage systems will minimise the loss of nutrients to ground water, helping to reduce nitrogen pollution and eutrophication.

Application Guidelines:

Seeding/laying new turf:	Apply at 1 - 4 tonnes per hectare to the seed bed before final preparation for sowing or laying turf
Established turf:	Apply at 0.5 - 1 tonne per hectare after aeration practices

Available in 20kg bags and bulk bags

best quality, best service, best value



Angus BioActive Thatch Reduce™

A carefully selected amalgamation of fungal & bacterial species formulated to efficiently break down thatch. Provided in an easily applied dispersible powder, this product will effectively remove unwanted organic matter, releasing humus and nutrients to the root zone.

- Effectively reduces thatch in all sports turf situations
- Optimises organic matter degradation
- Increases humus content in the root zone
- Releases nutrients for plant assimilation
- Improves root zone structure
- Reduces requirement for mechanical thatch removal, so less playing surface disruption
- Prevents build up of excessive organic matter in turf grass surfaces

Angus BioActive Thatch Reduce™

Apply at times when soil temperatures are above 7°C

Minimum 250g (max. 1kg) **BioActive Thatch Reduce™** in 200 – 300 litres of water / ha

For best results apply **Angus BioActive MolTurf®** @ 20 litres/ha soon after application of **BioActive Thatch Reduce™**

Further applications at minimum 4 week intervals may be required where thatch is particularly prevalent.

Angus BioActive Thatch Reduce™ is not a fertiliser and should be used as part of a fully planned and monitored fertility programme.

Available in 1kg sachets

best quality, best service, best value



Angus BioActive AquaClear™

A combination of natural bacteria that restrict availability of nutrients to algae in water. **Angus BioActive AquaClear™** uses natural bacterial ability to utilise phosphorus and nitrogen compounds for growth. Organic wastes of pond life and fertiliser run-off results in soluble phosphorus and nitrogen that stimulate the overgrowth of algae.

- **Helps maintain balanced eco-system in lakes & ponds**
- **Prevents the development of algae bloom**
- **Reduces harmful organic waste**
- **Maintains healthy, clean & clear water**

Bacteria can use very simple compounds as food nutrient sources. They actively grow on fertiliser and excreta. Nitrogen and phosphorus are used by bacteria in very similar ways to that of simple plants, such as algae. Unlike algae, most bacteria do not require sunlight for energy and some do not even need oxygen. The breakdown of carbon compounds in the environment provides the energy needed for bacteria. These carbon compounds, if derived from solely organic sources, may not be adequate for metabolism of large amounts of nitrogen and phosphorus. Bacteria require a balanced diet complete with micronutrients for optimum growth. **Angus BioActive AquaClear™** provides these missing components along with strains of bacteria that can naturally metabolise the excess nitrogen and phosphorus in the pond eco-system.

By deriving energy from carbon compounds rather than from photosynthesis, bacteria can work day and night, thus they do not cause diurnal variation in dissolved oxygen characteristic of large algae populations. This nutrient removal ability without the need of sunlight, gives bacteria a substantial advantage in the utilisation of nutrients. **Angus BioActive AquaClear™** is not an algicide, it is a blend of natural micro-organisms and growth accelerators that remove excess nutrients from the water column.

Some bacteria known as facultative anaerobes do not require free nitrogen and grow by utilising compounds such as Nitrate (NO_3) as an oxygen substitute in their metabolic process. These bacteria not only use ammoniacal nitrogen as a building block but by using nitrogen compounds as an energy source they also help to maintain a balanced pond eco-system by limiting the levels of nitrogen compounds. Bacteria will help eliminate many harmful components that may be found in pond water. Clean and clear water with the extra bonus of increased oxygen content are some benefits of the bacterial treatment.

Angus BioActive AquaClear™

Application Guidelines

Apply directly to area to be treated; this product should not be pre-hydrated.

Initial dosage: 2.2kg per 1,000 m³

Maintenance dosage: 368g per 1,000 m³

The maintenance dosage should be applied every two weeks until desired results are achieved

Angus BioActive AquaClear™ may cause temporary elevation in demand of oxygen during initial use.

Available in 250g sachets

best quality, best service, best value



Angus BioActive AcidipHier™

A concentrated, naturally occurring, organic chelating agent that promotes healthy plants and is fundamental to all aerobic lifeforms. Complexing with metallic cations Angus BioActive AcidipHier™ improves nutrient uptake and is transported throughout the plant affecting a wide range of plant functions promoting health & vigour.

- Promotes metabolism of beneficial microbes
- Chelates or complexes nutrients increasing availability to the plant
- Improves plants tolerance to environmental and biological stresses
- Results in stronger & healthier plants
- Concentrated natural formulation for best results
- Available as a soluble crystal for easy dissolving and low cost application
- Contains 2-hydroxypropane-1,2,3-tricarboxylic acid hydrate ($C_6H_8O_7 \cdot H_2O$)

Angus BioActive AcidipHier™

Apply at times when plant health is of most importance:

30kg / ha in 300 - 600 litres of water

Or at times of increased plant stress:

40kg / ha in 300 - 600 litres of water

A vitamin supplement which in turn creates a stronger host enabling it to create pathogeneses related protein which have an enormous effect on creating lignin by molecular crossing in cell which adds to pathogen protection.

This product can also be used for acidifying water and reducing bicarbonate content; dose rates are specific to water source and can only be offered on sight of recent source water analysis results. NB: It's important to ensure that bicarbonate content is not allowed to drop below 50mg/l.

Available in 25kg bags

best quality, best service, best value