

Sustainable Fertility For Turf



Experiencing Nature's Science™

PRODUCT CATALOG

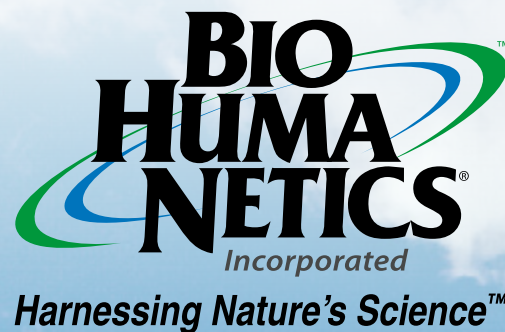
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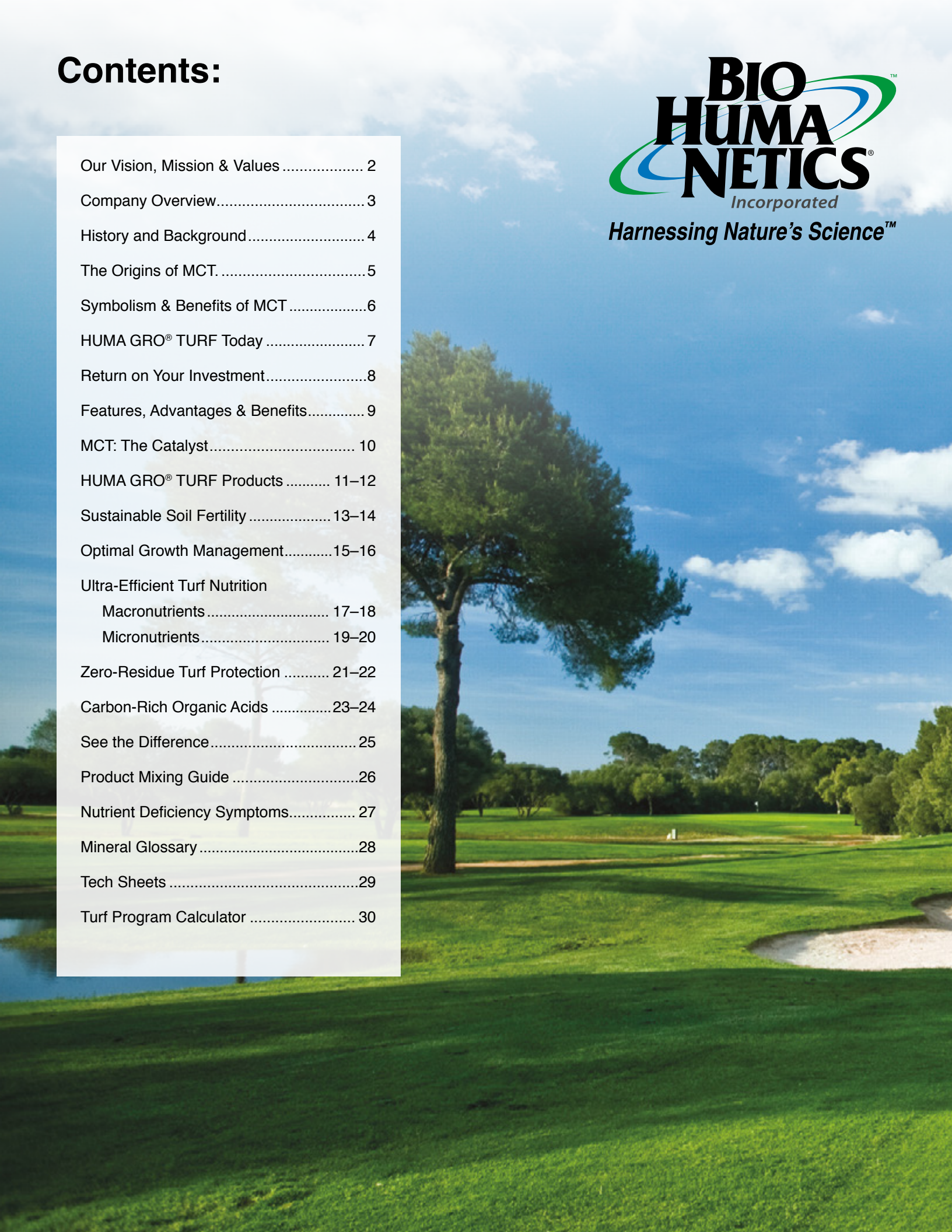
**MICRO CARBON
TECHNOLOGY®**

Playable • Environmentally Friendly • Efficient

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OUR VISION

Bio Huma Netics, Inc. (BHN) to be the global leader in providing sustainable solutions to the world's environmental challenges for agriculture, horticulture, turf, water & wastewater, and associated engineered technologies through its constantly improving Micro Carbon Technology®.

OUR MISSION

BHN provides technologically advanced and ecologically sustainable quality products and services that replenish the earth by restoring water quality, reviving soil fertility, renewing food and fiber value, and refocusing engineered technologies that minimize human environmental impact and enhance the quality of life worldwide.

OUR OPERATING VALUES

BHN treasures **quality relationships** by honoring and valuing each person's contributions toward success.

BHN asserts that **honesty and integrity** are the foundation for successful business and communications.

BHN focuses on **“win-win” outcomes** that foster a culture of synergy and mutual success.

BHN believes in an **abundance mentality**—resources properly managed allow everyone to share in the fruits of the harvest.





Company Overview

Founded as Sunburst Mining Company, Inc. in Mesa, Arizona, in 1973, Bio Huma Netics, Inc. (BHN) claims the uniqueness of “complexing” nutrients and other ingredients with very small organic molecules. These small molecules have come to be called by the company, “Micro Carbon Technology®” (MCT). MCT is what makes BHN’s liquid plant nutrition and specialty products much more effective and efficient than any other technology source on the market. Currently headquartered in Gilbert, Arizona, BHN offers over 70 sustainable liquid solutions. Each formulation is designed to increase the efficiency and productivity for agriculture under the HUMA GRO® brand, for turf & ornamentals with the HUMA GRO® TURF brand, and for wastewater treatment and environmental applications under the Probiotic Solutions® brand. BHN also offers Sustainable Smart SystemsSM technology infrastructure solutions with its wholly owned subsidiary engineering company, Opus-Prime, LLC.

History and Background



The name “Bio Huma Netics” signifies the study and application of the relationship (Netics) between the Earth (Huma) and living organisms (Bio).

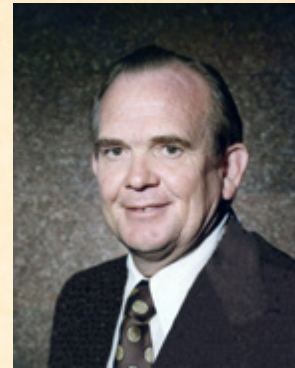
In 1973, Dr. Jordan Smith, Mr. Don Organ, and Mr. Delworth Stout made the first agricultural application of a unique oxidized humate material from a mine in the state of Idaho in the United States. They purchased the mine and called their company Sunburst Mining Company. This unique material is rich in natural organic compounds and minerals laid down over eons of time in fresh water. When applied to farm soils, it improved soil conditions, accelerated nutrient uptake, enhanced crop vigor, and increased yields.



Mr. Donald Organ



Dr. Jordan Smith



Mr. Delworth Stout

By 1981, Sunburst had developed a proprietary process to extract organic acids, valuable minerals, and other organic components from this material and updated the corporate name to Bio Huma Netics, Inc. (BHN). This extract contains the base of BHN’s unique Micro Carbon Technology® (MCT) that is the foundational ingredient used in all HUMA GRO®, HUMA GRO® TURE, and Probiotic Solution® products. MCT is combined with other beneficial components to create over 70 products the company produces today to improve soils, promote plant nutrition, manage growth, protect against pests, and make wastewater treatment more efficient.



The Origins of Micro Carbon Technology®

The beginning of our proprietary Micro Carbon Technology® can be traced back to 1973 when our scientists discovered a unique material in a mine located in the state of Idaho in the United States. The mine was purchased and our company was formed under the name of Sunburst Mining Company. When applied to farmers' fields, this material improved both the soil's fertility and the plants' nutrient uptake. We now know this material to be mainly composed of a high quality leonardite. Leonardite is defined as an oxygen-rich form of soft coal that is made up of decomposed plant matter and minerals.

Proprietary Extraction Process

Over the years since the discovery of this unique leonardite deposit, our scientists have perfected a proprietary time-tested biological and chemical extraction process. This process is designed to refine from the leonardite extremely small carbon-rich molecules and oxygen-rich organic molecules that are a sub-fraction of humic acid. These very small organic molecules we call our "Micro Carbon Technology®." A secondary proprietary process called "complexing" then blends nutrients together with the Micro Carbon Technology®. The complexing of nutrients with the Micro Carbon Technology® creates very efficient products. This means that growers can achieve more with less.

The Base of All Our Products

Using Micro Carbon Technology® (MCT) as the base, our company has developed over 40 highly efficient products in the HUMA GRO® TURF brand for nearly every turf application.

These highly efficient products do the following:

- They create an active, healthy, and ideal environment for long-term **sustainable soil fertility**.
- They provide all the major and minor nutrients for **ultra-efficient turf nutrition**.
- They balance and control plant hormonal activity for **optimal growth management**.
- They allow growers the option of **zero-residue turf protection**.
- They promote an abundant high quality turf and plants that enhance bottom-line profits.

MCT-based products have a positive environmental impact that promote the growth of roots and beneficial microorganisms in the soil, are safe for foliar application to leaves/turf with less toxicity and burn when applied per label instructions, and reduce the amount of fertilizer and protection products needed to accomplish maximum results!

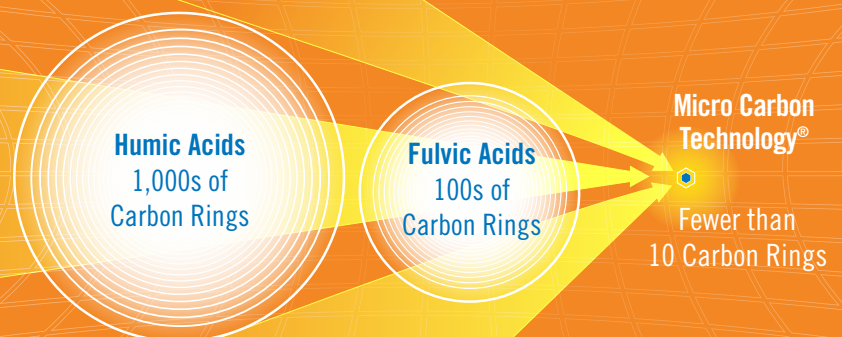
Origins of



MICRO CARBON TECHNOLOGY®

Delivering Nature's Science™

Micro Carbon Technology® is our special foundational ingredient for all products produced by Bio Huma Netics, Inc. This Micro Carbon Technology® adds efficiency and effectiveness to each product and generally makes HUMA GRO® TURF products several times more efficient than conventional agrochemicals and fertilizers.



Symbolism of Micro Carbon Logo

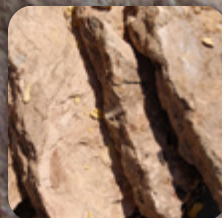
Our Independent Laboratory Analysis and Field Reports show that products that contain BHN's Micro Carbon Technology® (MCT) are highly efficient and accomplish better results at a much lower application rate and at a lower cost. You will not want to apply anything to your turf and plants without it!



- **Hexagonal Ring** – Carbon-rich technology based on the benzene ring.
- **Brown Soil** – Improves soil health, fertility, and physical structure.
- **Green Leaf** – Uses carbon as a delivery vehicle for essential elements to growing plants and turf.
- **Blue Water** – Cleans contaminated water systems.

Benefits of Micro Carbon Technology®

- **Non-Selective**—Complexes with both positive and negative ions (anions and cations).
- **Very Efficient**—More efficient than granular fertilizers and more effective than high quality chelates.
- **Versatile Delivery**—Can be applied to the soil directly and/or through all irrigation systems and/or as a foliar spray.
- **Micro Molecule**—Very small molecule that adds effectiveness to fertilizers and protects nutrients from soil “tie up.”
- **Highly Oxidized**—Many chemically active carbon-based functional groups.
- **Greater Surface Area**—Higher number of complexing sites due to fractioning, splitting, or refining of complex carbon-rich molecules.



HUMA GRO® TURF Today

HUMA GRO® TURF is BHN's line of turf products. Each HUMA GRO® TURF product is built upon our exclusive, proprietary Micro Carbon Technology® (MCT) which has a very small molecular structure. These ultra-fine molecules are excellent nutrient carriers that enhance root assimilation and/or foliar plant uptake. This allows you to have healthy turf and plants while lowering your fertilizer budget and handling costs. Essentially, HUMA GRO® TURF with MCT gives you more for less. This unique combination of natural ingredients, ultra-fine molecules, and specialized processing methods produces the most advanced soil activators, nutrients, and organic turf protection available on the market today!

Proven Technology

Research & field studies show our products delivered by MCT are more efficient than other similar products, thus producing better results with less product.



Globally Trusted

There are over 15 countries across the world that now proudly use HUMA GRO® TURF products.

All our products are manufactured and complexed in our Arizona facilities.



*Experiencing
Nature's
Science™*



Mutual Success

We believe that our success and growth over the years is due to our loyal customers and trustworthy employees.





Return on Your Investment...

with HUMA GRO® TURF

Maximize Turf Quality

You can count on HUMA GRO® TURF liquid products to deliver higher quality turf and ornamentals at a much lower cost than most conventional fertilizer products. Each and every one of our high-quality products includes our proprietary Micro Carbon Technology® as a base for ultra-efficient absorption and uptake. This improved efficiency benefits your bottom line by delivering healthy, quality turf.

HUMA GRO® TURF products and programs allow you to implement best management practices that comply with the industry's **4Rs of Nutrient Stewardship**:

- Select the **Right Fertilizer**.
- Determine the **Right Rate**.
- Schedule the **Right Time**.
- Apply products in the **Right Place**.

FEATURES	ADVANTAGES	BENEFITS
Unique Vehicle	Tiny carbon rich molecules enter and transport nutrients throughout the plant.	Saves money in fertilizer and handling costs. Get more for less.
Optimal Nutrition	Complete nutritional package that replaces all fertility needs. Better turf health.	Use fewer chemicals, spend less money and be more environmentally sound. True sustainability that gives more alternatives.
Liquid Versatility	Can be applied in multiple types of application methods. Can be sprayed on or injected into all types of irrigation.	Flexibility. The right application method that can meet current cultural practices.
Concentrated	Smaller volume needed to cover more turf. Easier to ship.	Lower shipping costs. Lower application rates. Less handling.
Smaller Molecule	Facilitates the absorption of essential mineral nutrients through both roots and turf. Stabilizes nutrients so they are not tied up in the soil.	Nutrient deficiencies can be effectively treated when they show up. Better performance from nutrients applied.
Easily Mixes	Can be applied simultaneously with other products. Improves efficiency and performance of other products.	Blends well with other nutrients and most pesticides. Makes what is applied better, hotter, and more effective.
More Availability	Resists soil tie up and releases nutrients that are blocked.	Better results from your fertility investment.
Organic Turf Protection	OMRI listed to be used in organic production. Zero re-entry interval. Environmentally friendly.	Zero toxicity when applied according to label instructions. Better bottom line.



Micro Carbon Technology® The Catalyst for:

SUSTAINABLE SOIL FERTILITY



Unlike Conventional Soil Products, HUMA GRO® TURF Sustainable Soil Fertility Products with MCT:

- Stimulate naturally occurring soil biology.
- Change soil's physical characteristics (flocculates clays) within 15–20 days.
- Stimulate up to 50 lbs/acre (56 kg/hectare) of soil bio-mass in one application.
- Release tied up nutrients, increasing availability in all soil types.
- Buffer stress from soil toxicities (salts & heavy metals).
- Improve water penetration and water-holding capacity.
- Increase root mass development naturally – up to 25% and more.
- Promote long-term soil sustainability.

OPTIMAL GROWTH MANAGEMENT



Unlike Synthetic Hormones, HUMA GRO® TURF Optimal Growth Management Products with MCT:

- Stimulate natural hormonal production within the turf for uniformity.
- Use natural plant metabolic processes without long-term side effects.
- Can be used where timing is not as critical a factor for effectiveness.
- Are less expensive and resolve many turf nutritional deficiencies at the same time.
- Do not create environmental hazards and have zero public health concerns.
- Manipulate the plant to do what you want it to do, when you want it to do it.

ULTRA-EFFICIENT TURF NUTRITION



Unlike Conventional Nutrition Products, HUMA GRO® TURF Ultra-Efficient Nutrition Products with MCT:

- Lower the amount of N-P-K applied per acre/hectare with higher efficiency and lower costs.
- Are complexed nutrients that are more efficient than the best conventional nutrients.
- Are easy-to-apply liquids with fewer handling headaches.
- Buffer nutrients so they are not phytotoxic to leaves and will not burn roots.
- Decrease N-P-K residues for reduced toxicity and environmental impact.
- Mix well with most other nutrient solutions, PGRs, and other chemicals and most pesticides.
- Significantly increases turf quality.

ZERO-RESIDUE TURF PROTECTION



Unlike Conventional Protection Products, HUMA GRO® TURF Zero-Residue Protection Products with MCT:

- Contain zero harmful chemical residues or contaminants that damage the environment or create concern for human health.
- Support long-term use effectiveness due to natural chemistries where pests cannot develop resistance.
- Require minimal personal protective gear for application and have zero re-entry requirements.
- Will kill on contact, with proper coverage.
- Spray and Play: Can be applied at any time without costly down time.

CARBON-RICH ORGANIC ACIDS



Unlike Conventional Organic Acids, HUMA GRO® TURF Carbon-Rich Organic Acid Products with MCT:

- Are high-performing fertility products based on organic acid compounds rich in carbon.
- Contain a make-up similar to the plants' own, making it easier for the nutrients to assimilate through the roots and leaves.
- Buffer roots against the damaging effect of highly acidic or alkaline soils.
- Maximize the potential of your fertilizer resulting in better germination, efficient foliar applications, and a healthier growth.

HUMA GRO® TURF Products with MCT

SUSTAINABLE SOIL FERTILITY

MULTI-PURPOSE™
FERTIL HUMUS®
ZAP®
ENCAPSALT®
KLEENUP™
SURF-MAX®

OPTIMAL GROWTH MANAGEMENT

VITOL®
BREAKOUT®
TURF MICRO™
SILI-MAX®
SIL-K™
TUFF GREENS™

CARBON-RICH ORGANIC ACIDS

X-TEND®
FULVI PRO®
HUMA BURST®
HUMA PRO®



ULTRA-EFFICIENT TURF NUTRITION

MACRONUTRIENTS

SUPER NITRO[®]
SUPER PHOS[®] (PHOS-MAX[™])
SUPER POTASSIUM[™]
CURIOSITY[™]
TURFPLEX[®] VII
TURFPLEX[®] IV
TURFPLEX[®] QR
TURFPLEX[®] SR
38 SPECIAL[®]
C-PHOS[™]

MICRONUTRIENTS

44 MAG[®]
BORO-MAX[®]
CALCIUM
COMOL[™]
TURF IRON[™]
MANGANESE
MAX PAK[®]
MAG-I-CAL[™]
SULFUR
COPPER
Z-MAX[®]

ZERO-RESIDUE TURF PROTECTION

PROUD 3[®]
PROMAX[®]



SUSTAINABLE SOIL FERTILITY

HUMA GRO® TURF sustainable Soil Fertility Products with Micro Carbon Technology® (MCT) improve soil structure by flocculating hard soils and caliche barriers to soften the soil. They diminish the stress of saline soils and heavy metals, facilitating the proper mineral nutrition of the plant. MCT promotes oxygenation and aeration, which improves water penetration and water-holding capacity and makes nutrients readily available to the roots. They stimulate root-mass development, which promotes better seedling emergence and faster, stronger starts. Extensive root growth, particularly in the early stages of turf development, helps reduce turf stress from adverse environmental conditions—especially during periods of extreme temperatures or drought.

Sustainable Soil Fertility Products with MCT build a rich foundation to a healthy soil environment for the turf. They reduce the risk of soil-borne diseases because they create a good balance between beneficial fungi and beneficial bacteria, as well as create a positive maintenance of the aerobic microorganisms over the anaerobic microorganisms. These products effectively increase microbial activity and microbial species diversity in the soil.

It's important to have a healthy, fertile soil to maximize the production of quality turf and plants. HUMA GRO® TURF Sustainable Soil Fertility Products do an outstanding job of stimulating soil fungal and bacterial activity and maintaining balance for a healthy, productive soil. Don't treat your soil like dirt, use HUMA GRO® TURF!



MULTI-PURPOSE™

(5-0-0 + Fe, Zn, Mn)

MULTI-PURPOSE™ is a complex soil conditioner containing a unique mixture of Micro Carbon Technology® and bio-stimulants designed to stimulate microbial activity in soil. Supplementary micronutrients and growth hormones are added that improve soil properties, increase nutrient availability to the plant, and improve overall turf quality.

FERTIL HUMUS®

(24-0-0 + Fe, Zn, Mn)

FERTIL HUMUS® is a unique formulation of nutrition and enzymes with a Micro Carbon Technology® base that stimulates an active humus-rich soil and improves overall soil condition. FERTIL HUMUS® enhances aerobic decomposition of organic matter and it releases nutrients tied up in organic matter. FERTIL HUMUS® helps protect the plant from heavy metals and toxic substances in the soil, and also creates thatch control.

ZAP®

(8-0-0 + Fe, Zn, Mn, S)

Huma Gro® Turf ZAP® is an organic-based formulation for the treatment of unhealthy soil conditions through improved beneficial soil biological balance. ZAP® promotes a strong, healthy soil biology resulting in the natural management of soil pathogens and parasitic nematodes.

Build Your Turf From the Ground Up™



ENCAPSALT™

(5-0-0)

ENCAPSALT® is a soil activator combined with surfactants on a Micro Carbon Technology® base that helps sequester and buffer salts in the root zone. ENCAPSALT® is also used to break free the Na⁺ ion, allowing irrigation to move salts down into the soil profile. It aids with water penetration and resolves crusty, hard soils.

KLEENUP™

(15-0-0)

KLEENUP™ is a soil remediation product with Micro Carbon Technology® that speeds up the degradation and breakdown of petroleum and harmful or toxic chemicals.

SURF-MAX®

(0-0-0)

SURF-MAX® complexed with Micro Carbon Technology® is a blend of nonionic surfactants designed to improve both penetration and lateral movement of water within the root zone and increase soil moisture retention. By improving the infiltration and distribution of water in the soil profile, SURF-MAX® ensures that turf managers are getting the most out of their applied water and water-carried inputs.

OPTIMAL GROWTH MANAGEMENT

HUMA GRO® TURF offers Optimal Growth Management with Micro Carbon Technology® (MCT) that promotes, through balanced nutrition, the natural production of hormones within the plant for both quick and long-term beneficial response without side effects. Upon applying the plant growth management products, there is an almost immediate response demonstrated by a boost of energy, growth, vigor, rooting, and bud formation. In addition, these products provide a long-term, natural production of hormones that maintains optimal plant hormonal balance.

HUMA GRO® TURF Optimal Growth Management products provide energy for more efficient metabolic processes such as transpiration, photosynthesis, respiration, nutrient uptake, and translocation within the turf. Each of these products are specifically formulated to accomplish certain functions within the plant—such as the formation of roots, buds and meristem growth, flowering, as well as uniform maturation. They reduce turf stresses from environmental extremes and chemical over-application. They also promote development of tolerance factors within the plant to combat pests and diseases.

MCT allows optimal management of plant growth by promoting natural (non-synthetic) metabolic production of hormones within the plant itself that are quickly produced and naturally controlled.



VITOL®

(8-16-4 + S, Fe, Mn, Zn)

VITOL® complexed with Micro Carbon Technology® feeds the natural metabolic processes within turf for vegetative development. It increases the nutrient uptake of the turf needed to move it smoothly through its growth stages. It also improves plant recovery from environmental stresses during peak crop demand periods.

BREAKOUT®

(4-14-2)

BREAKOUT® is a unique blend of foliar nutrients, polysaccharides, and carbohydrates engineered to promote horizontal turf growth, build a stronger root system, and develop healthier turf. Micro Carbon Technology® is included to ensure better deliverability of nutrients to plants.

TURF MICRO™

(0-5-0 + Fe, Mn, Zn)

TURF MICRO™ complexed with Micro Carbon Technology® is a complex formulation of nutrients and refined plant oils that increases turf tolerance to disease and facilitates nutrient uptake and translocation throughout the turf.

IMPROVE Blade Structure with Tuff Greens™



SIL-K™

(0-0-10 + 5% Si)

SIL-K™ complexed with Micro Carbon Technology® provides the potassium and silica essential for stronger leaf blades for heat and wear tolerance. Silica provides important strength to plant cell walls, helping grass stalks to stay upright, and is beneficial in stimulating natural plant defenses against fungal pathogens.

SILI-MAX®

(0-0-0 + 10% Si)

SILI-MAX® complexed with Micro Carbon Technology® is a highly available source of silica, which is essential in turf and plants for stronger heads, shoots, and blades. It increases the strength and rigidity of the plant cells and cell walls to prevent lodging or flopping. It also increases the tolerance of turf and plants to disease, insects, and high levels of available soil manganese.

TUFF GREENS™

(0-0-13)

TUFF GREENS™ is a potassium blend designed to enhance the turf's ability to withstand heavy traffic. It is an excellent product for use prior to and during tournaments and other heavy-use periods. Micro Carbon Technology® is included to increase the availability and uptake of nutrients, producing a more vigorous turf.

ULTRA-EFFICIENT TURF NUTRITION

HUMA GRO® TURF Ultra-Efficient Turf Nutrition products with Micro Carbon Technology® (MCT) offer a variety of packaged fertility products that deliver all the essential macronutrients (N-P-K), secondary nutrients (sulfur, calcium, magnesium), and micronutrients (boron, iron, manganese, zinc, copper, and more) individually packaged to promote the strong, steady growth of your turf and produce a better, greener turf. All of these high-quality products include our proprietary MCT as a base for better transportation and absorption of nutrients by plants. They are concentrated and complex formulations to maximize nutrient availability for improved plant vigor, health, and quality. The added efficiency of these products will let you achieve superior results using less fertilizer—which equates to decreased handling, lower storage expense, and lower overall fertilizer costs.

MCT encourages a quick and sustained uptake of nutrients because of a chemical bonding to plant nutrients by very small carbon-rich molecules that protect from losses due to volatilization, leaching, and other environmental factors in the soil, air, or on the leaf or root surface. All of our products have the capacity for effective and efficient assimilation when the nutrients are applied to the soil or the leaves. This improved efficiency benefits your bottom line because now you can obtain a rich return on your fertility investment by applying the necessary nutrients without breaking the bank! Your HUMA GRO® TURF representative can work with you to determine the best combinations and concentrations of macronutrients, secondary nutrients, and micronutrients that will be most beneficial for your turf.



SUPER NITRO®

(30-0-0)

SUPER NITRO® with Micro Carbon Technology® is a complexed nitrogen source that can be foliarly applied, according to label directions, without the risk of phytotoxicity. It can also be soil-applied for nitrogen release while keeping it stable in the root zone. It reduces nitrogen losses from leaching and volatilization. SUPER NITRO® enhances cellular respiration that promotes a longer productive plant life.

SUPER PHOS® (PHOS-MAX™)

(0-50-0)

SUPER PHOS® complexed with Micro Carbon Technology® can be applied by foliarly applied, according to label directions, without the risk of phytotoxicity and keeps phosphate available and soluble in the soil solution for rapid and controlled uptake by plant roots without being blocked by clays or organic matter. Phosphate encourages the production of amino acids, proteins, and carbohydrates necessary for cellular division.

SUPER POTASSIUM™

(0-0-40)

SUPER POTASSIUM™ complexed with Micro Carbon Technology® is a concentrated potassium product that contains enzymes and coenzymes, complexed and biologically active, to maximize potassium uptake by plants. SUPER POTASSIUM™ promotes internal cellular strength and regulates the movement of water and nutrients within the turf & plant.

TURFPLEX® VII

(7-7-7 + Mg, S, B, Cu, Fe, Mn, Mo, Zn,Co)

TURFPLEX® VII is an activated nutrient formulation complexed with Micro Carbon Technology®. It is a complete nutrient package containing all major and most minor nutrients. TURFPLEX® VII provides excellent foliar nutrition as well as activating the beneficial biology in the soil. This is a complete nutrient product designed for all types of turf in a wide range of conditions. It provides an excellent foundation for the maintenance of healthy, vigorous growth

TURFPLEX® IV

(20-2-3 + S,Fe,Mn,Zn)

TURFPLEX® IV is a well-rounded formulation of complexed macro and micronutrients designed to promote lush, green growth in turf grass. Micro Carbon Technology® is included to increase the availability and uptake of nutrients, producing a more vigorous turf.

MACRONUTRIENTS (N-P-K)



MICRO CARBON
TECHNOLOGY®

*Improve Your Bottom Line
with Efficient Nutrition*



CURIOSITY™

(12-4-3)

CURIOSITY™ complexed with Micro Carbon Technology® provides a unique combination of macronutrients and micronutrients for grass—and biostimulants designed to stimulate microbial activity in the soil—to improve overall turf quality. This complete product provides an excellent foundation for plant and soil health that supports all types of turf in a wide range of conditions.

TURFPLEX® QR

(16-4-4)

TURFPLEX® QR is a well-rounded N-P-K product with a Micro Carbon Technology® base. Its nutrients are released quickly for rapid uptake in cool conditions. It stimulates root growth and improves soil conditions for greater turf vigor.

TURFPLEX® SR

(10-2-6)

TURFPLEX® SR complexed with Micro Carbon Technology® is a general use fertilizer with organic acids designed for slow, steady release of nitrogen, phosphorus, and potassium.

38 SPECIAL®

(4-14-12 + 8% S)

38 SPECIAL® complexed with Micro Carbon Technology® is designed for a wide range of uses and can be applied to promote root growth in seeding and installation of new sod.

C-PHOS™

(4-25-0 + 5% Ca)

C-PHOS™ complexed with Micro Carbon Technology® nourishes turf & plants and corrects calcium and phosphorous deficiencies in a uniquely clear and stable formulation that retains the effectiveness and efficiency of the individual elemental components.

ULTRA-EFFICIENT TURF NUTRITION

Secondary macronutrients (magnesium, calcium, and sulfur) and micronutrients (boron, chlorine, copper, iron, manganese, molybdenum, nickel and zinc) are known to play many complex roles in turf development. In many ways, they hold the key to how well the other nutrients are used. They promote the strong, steady growth of turf grasses that produce healthier plants and improved playing surfaces—maximizing a plant's genetic potential. In particular, their presence can have a great impact on root development, seed viability, and plant health and vigor. However, these nutrients are quickly depleted, resulting in the need for applying ever-increasing amounts of fertilizers to get the same results.

Huma Gro® offers a complete line of liquid fertilizer formulations powered by Micro Carbon Technology® (MCT) that allow application of these secondary macronutrients and micronutrients at the exact growth stage when they are most needed. The MCT improves the absorption of nutrients by turf plants; this improved efficiency saves money and reduces waste because less fertilizer is needed to get great results. Whatever your turf type, whatever your soil, we can help you find the best nutrient solution for vigorous turf growth and optimal playing surfaces.



44 MAG®

(0-0-0 + 5% Mg, 5.5% S)

44 MAG® complexed with Micro Carbon Technology® ensures maximum assimilation of magnesium, which is the essential part of the chlorophyll molecule that gives plants their green color.

BORO-MAX®

(0-0-0 + 10% B)

BORO-MAX® complexed with Micro Carbon Technology® ensures efficient and effective uptake of boron, which is required for cell division, plant metabolism, cell structure, sugar transport, pollination, and seed development.

CALCIUM

(8-0-0 + 10% Ca)

CALCIUM complexed with Micro Carbon Technology® ensures maximum calcium uptake and translocation within turf. Calcium is a required nutrient for plant health and cellular strength and growth that reduces the risk of fungal diseases.

COMOL™

(0-5-0 + 3% Mo, 1% Co)

COMOL™ complexed with Micro Carbon Technology® ensures efficient nutrient uptake and translocation of phosphorus, cobalt, and molybdenum, which encourage production of amino acids, proteins, and carbohydrates necessary for cellular division, nodulation of legumes, microbial functions, recovery from plant stress, enzyme activities, and nitrogen metabolism.

COPPER

(0-0-0 + 5% Cu, 3% S)

COPPER complexed with Micro Carbon Technology® ensures efficient and effective uptake of copper, which is a micronutrient involved in many plant metabolic processes including photosynthesis, enzyme activity, protein metabolism, nitrogen regulation, and plant vigor.

MAG-I-CAL™

(7-0-0 + 8% Ca, 4% Mg)

MAG-I-CAL™ complexed with Micro Carbon Technology® ensures maximum magnesium and calcium uptake and translocation within the plant. Magnesium is important in the production of chlorophyll and promotes the activity of enzymes. Calcium is a required nutrient for cellular strength and growth and plant health—which indirectly reduces the risk of fungal diseases.



*Give Your Turf the
Extra Edge™*



MANGANESE

(0-0-0 + 5% Mn, 2.5% S)

MANGANESE complexed with Micro Carbon Technology® ensures efficient and effective uptake of manganese, which is a micronutrient involved in many plant metabolic activities—including photosynthesis, enzyme activity, and nutrient regulation

MAX PAK®

(0-0-0 + S, Fe, Mn, B, Mo, Co, Zn, Cu)

MAX PAK® is a liquid micronutrient formulation containing a highly stable source of many important micronutrients, plus Micro Carbon Technology® for better deliverability of nutrients to turf. MAX PAK® is leaf-friendly, salt-buffered, and formulated to ensure maximum efficiency

SULFUR

(8-0-0 + 10% S)

SULFUR, complexed with Micro Carbon Technology®, enables sulfur nutrient absorption by the plant. Sulfur is a major nutrient involved in respiration, photosynthesis, amino acid metabolism, plant growth, and vigor.

TURF IRON™

(12-0-0 + 8% Fe, 4% S)

TURF IRON™ is a liquid iron source with Micro Carbon Technology® for more efficient delivery of nutrients to turf. Iron, a key component in photosynthesis, can be applied to relieve yellowing or chlorotic symptoms in turf.

Z-MAX®

(0-0-0 + 8% Zn, 5% S, 2% Mn, 0.5% Cu)

Z-MAX® complexed with Micro Carbon Technology® ensures efficient and effective uptake of zinc, sulfur, manganese, and copper to optimize micronutrient nutrition of the plant that can help suppress certain external and internal plant stresses. It is a highly concentrated micronutrient solution designed to improve plant nutrition and vigor. Z-MAX® is a great additive to your pest management arsenal.

ZERO-RESIDUE TURF PROTECTION



HUMA GRO® TURF Zero-Residue turf protection products have shown great success in treating disease-infested turf and soils. Our turf protection products use natural materials (such as botanical oils, proteins, minerals, etc.) to control nematodes, insects, and bacterial and/or fungal plant diseases.

The HUMA GRO® TURF organic turf protection contains essential components to maximize effectiveness against a broad spectrum of insects and pathogens. Spray and Play: they can be applied anytime during the year, even same-day application as using the turf field.

HUMA GRO® TURF organic protection products are OMRI-listed for environmentally conscious superintendents. These products are designed for specific soil and foliar applications. They are both curative and protective, giving managers an effective, environmentally safe alternative to conventional chemistries.



Foliar-Applied

PROUD 3®



PROUD 3® is an organic-listed turf protection product with a zero re-entry interval. It is a safe and effective, foliar-applied insecticide, miticide, and fungicide. PROUD 3® kills fungal hyphae and prevents fungal spores from germination. As an insecticide, it works best on soft-bodied insects or on the juveniles: the mode of action is as a contact killer.

*Safe and Effective Turf Protection
"Spray and Play"™*



Soil-Applied

PROMAX®



PROMAX® is an organic-listed, EPA-exempt biopesticide that controls harmful soil-borne diseases and plant parasitic nematodes through contact. Additionally, PROMAX® enhances root growth and, as a result, reduces susceptibility to secondary root infection.

CARBON-RICH ORGANIC ACIDS

HUMA GRO® TURF's exclusive processes allow us to offer you high-performing fertility products based on organic acid compounds rich in carbon. These natural organic acids are similar to the chemical make-up of the plants themselves, so it's easier for the roots or leaves to assimilate the added nutrients and put them to work more effectively. Our Carbon-Rich Organic Acids also work in protecting roots against the damaging effects of highly acidic or alkaline soils.

With HUMA GRO® TURF Carbon-Rich Organic Acid products, your turf can maximize the potential of your fertilizer, resulting in better germination, more efficient foliar applications, and strong, healthy growth.



X-TEND®

(3-2-0)

X-TEND® is a concentrated Micro Carbon Technology® product with high levels of organic acids and nutrients. X-TEND® is formulated to be blended in liquid fertilizers or to be impregnated onto dry fertilizers, which extends the effectiveness of the fertilizer or fertilizer solutions.

FULVI PRO®

(0-0-0 + 20% FA)

FULVI PRO® complexed with Micro Carbon Technology® is an activated liquid fulvic acid source derived from highly oxidized leonardite material. FULVI PRO® provides a liquid carbon-rich foliar additive as well as a food substrate for the beneficial biology in the soil.

Higher Carbon For Better Results



HUMA BURST®

(0-0-0 + 70% HA)

HUMA BURST® is a dry, uniform, granulated humic acid product derived from a highly oxidized, naturally occurring carbon-rich material called leonardite. HUMA BURST® was created for the treatment of carbon-depleted soil conditions and improved organic matter balance.

HUMA PRO®

(0-0-0 + 6% HA)

HUMA PRO® complexed with Micro Carbon Technology® is an activated liquid humic acid source derived from a highly oxidized, naturally occurring carbon and mineral deposit. For the treatment of unbalanced soil conditions caused by the lack of humic acid. HUMA PRO® promotes a stronger, healthier soil for sustainable turf growth.

See the Difference



Confirmed by Science, Turf Validated™



Product Mixing Guide

- 1) When in doubt as to compatibility, please perform a jar test before mixing in large quantities.
- 2) The mixing container should be fiberglass, plastic, stainless steel, or rubber lined and capable of withstanding heat exchanges.
- 3) Use a large enough container to adequately handle the initial mixture, plus room in the container for at least twice the water.
- 4) Use a good stir rod such as a 3-to-6-foot PVC pipe, or use a mix tank agitation system.
- 5) Start making the mix by adding into the container half the water you plan to use.
- 6) Use a 3-gallon measuring bucket with a handle for measuring the products to add and/or use a 1-quart/1-liter measuring pitcher with ounces and/or mL increments for small measurements.
- 7) Add in or mix the **HUMA GRO® TURF** products into the water in the order from most acidic to most basic or alkaline from pH (0.1) to pH (16.7) as shown below.
- 8) Fill the container capacity with the rest of the water you will use.
- 9) As a rule of thumb, leave the products with the most basic pHs (> 7.0), such as **SUPER POTASSIUM™**, until the very last and add very slowly. If there is a reaction, it will be immediate and, with a little patience and stirring, should mix in well.
- 10) If adding a pesticide or fungicide to the fertilizer solution, add after all the **HUMA GRO® TURF** products are thoroughly mixed. Do a jar test first for compatibility.
- 11) Never apply total **HUMA GRO® TURF** products plus other ag chemicals at more than 10% concentration of the finished application mix.

PRODUCT pH (Acidic to Basic)

Calcium	0.1–0.5	PROUD 3®	4.5–5.5
SUPER PHOS® (PHOS-MAX™)	0.1–1.0	TURFPLEX® QR	5.0–6.0
C-PHOS™	0.3–1.0	ZAP®	5.5–6.5
MAG-I-CAL™	0.5–1.5	FERTIL HUMUS®	6.0–7.0
Sulfur	0.7–1.7	TURFPLEX® IV	6.2–7.2
MAX PAK®	1.2–1.7	KLEENUP™	6.5–7.0
COMOL™	1.3–2.1	PROMAX®	6.5–7.5
Manganese	1.4–2.0	38 SPECIAL®	6.6–7.6
TURF MICRO™	1.4–2.4	TURFPLEX® SR	6.7–7.7
FULVI PRO®	1.5–2.5	ENCAPSALT®	7.0–8.0
44-MAG®	1.5–2.5	SUPER NITRO®	7.0–8.0
BREAKOUT®	1.7–2.7	BORO-MAX®	7.6–8.6
VITOL®	1.8–2.8	HUMA PRO®	8.0–9.0
Copper	2.1–3.1	MULTI-PURPOSE™	8.0–9.0
Z-MAX®	2.5–3.5	X-TEND®	8.0–9.5
TURF IRON™	2.6–3.6	SILI-MAX®	11.5–12.5
TURFPLEX® VII	3.2–4.2	SIL-K™	14.0–15.0
CURIOSITY™	3.5–4.5	TUFF GREENS™	14.5–15.5
SURF-MAX®	4.0–5.0	SUPER POTASSIUM™	15.7–16.7

Turf Specialty Programs

GREENS

Product Mix	Per 1,000 ft ²	Per 100 m ²
BREAKOUT®	3 oz	105 mL
TURF IRON™	3 oz	105 mL
MULTI-PURPOSE™	3 oz	105 mL
TURFPLEX® VII	3 oz	105 mL

THATCH CONTROL

Product Mix	Per 1,000 ft ²	Per Acre
Water	5 gal	50 gal
FERTIL HUMUS®	2 oz	2 qt
TURFPLEX® IV	3 oz	1 gal
SURF-MAX®	1 oz	1 qt

WATER CONSERVATION

Product Mix	Per 1,000 ft ²	Per Acre
SURF-MAX®	0.5–0.75 oz	24–32 oz per 80 gal
FERTIL HUMUS®	2 oz	2 qt
MULTI-PURPOSE™	2 oz	2 qt

SALT CONTAMINATION

Product Mix	Per 1,000 ft ²	Per Acre
Water	5 gal	50 gal
ENCAPSALT®	2 oz	2 qt
SURF-MAX®	1 oz	1 qt

FAIRWAYS

Product Mix	Per 1,000 ft ²	Per Acre
CURIOSITY™	6 oz	2 gal
BREAKOUT®	2 oz	2 qt
TURF IRON™	3 oz	1 gal

FAIRWAY COLOR

Product Mix	Per 1,000 ft ²	Per Acre
BREAKOUT®	2 oz	2 qt
TURF IRON™	3 oz	1 gal
MULTI-PURPOSE™	2 oz	2 qt

TOURNAMENT PREP

Product Mix	Per 1,000 ft ²	Per Acre
BREAKOUT®	3 oz	1 gal
TURFPLEX® IV	3 oz	1 gal
TUFF GREENS™	3 oz	1 gal
MAX PAK®	2 oz	2 qt
MULTI-PURPOSE™	3 oz	1 gal

ROOT DRIVER

Product Mix	Per 1,000 ft ²	Per Acre
SURF-MAX®	0.5–0.75 oz	24–32 oz per 80 gal
BREAKOUT®	3 oz	1 gal
FERTIL HUMUS®	2 oz	2 qt
MULTI-PURPOSE™	3 oz	1 gal
ZAP®	6 oz	6 qt



**MICRO CARBON
TECHNOLOGY®**

Products contain Micro Carbon Technology®, a proprietary blend of very small organic molecules that allow for more effective absorption of nutrients by plants.

FAIRY RING

Product Mix	Per 1,000 ft ²	Per Acre
Water	5 gal	50 gal
PROMAX®	6 oz	2 gal

BLACK PLUG LAYER

Product Mix	Per 1,000 ft ²	Per 100 m ²
Water	5 gal	50 gal
ZAP®	9 oz	9 qt

RECOVERY & REPAIR

Product Mix	Per 1,000 ft ²	Per Acre
BREAKOUT®	3 oz	1 gal
TURFPLEX® VII	6 oz	2 gal
MULTI-PURPOSE™	3 oz	1 gal

CHEMICAL TOXICITY

Product Mix	Per 1,000 ft ²	Per Acre
Water	5 gal	50 gal
KLEENUP™	2 oz	2 qt
SURF-MAX®	1 oz	1 qt

HEAVY TRAFFIC

Product Mix	Per 1,000 ft ²	Per Acre
Water	5 gal	50 gal
SIL-K™	2 oz	2 qt
MULTI-PURPOSE™	1 oz	1 qt
TURFPLEX® IV	9 oz	3 gal

HEAT STRESS

Product Mix	Per 1,000 ft ²	Per Acre
SURF-MAX®	0.5–0.75 oz	24–32 oz per 80 gal
CALCIUM	2 oz	2 qt
SIL-K™	2 oz	2 qt
MULTI-PURPOSE™	2 oz	2 qt
TURFPLEX® VII	3 oz	1 gal


HYDRAULIC SPILLS

Product Mix	Per 1,000 ft ²	Per Acre
Water	5 gal	50 gal
KLEENUP™	2 oz	2 qt
SURF-MAX®	1 oz	1 qt
BREAKOUT®	3 oz	1 gal
TURFPLEX® VII	3 oz	1 gal

OVERSEEDING

Product Mix	Per 1,000 ft ²	Per Acre
SURF-MAX®	0.5–0.75 oz	24–32 oz per 80 gal
BREAKOUT®	3 oz	1 gal
FERTIL HUMUS®	1 oz	1 qt
MULTI-PURPOSE™	3 oz	1 gal
TURFPLEX® IV	3 oz	1 gal

HUMA GRO® TURF Tech Sheets



BREAKOUT® Optimal Growth Manager

Guaranteed Analysis 4-14-2

Total Nitrogen (N)	4.00%
0.55% Ammoniacal Nitrogen	
3.45% Urea Nitrogen	
Available Phosphate (P ₂ O ₅)	14.00%
Soluble Potash (K ₂ O)	2.00%

Derived From: Urea, Phosphoric Acid, Potassium Carbonate, Ammonium Sulfate

Additional Contents: Micro Carbon Technology™

Physical Properties:
Form: Liquid
Appearance: Milky brown, with a slight characteristic odor
Weight: 10.87 lb/gal, 1.33 kg/L
pH: 1.7–2.7

Caution: Keep out of reach of children.
Hazard if swallowed: May cause severe skin burns and eye damage.

Storage and Disposal: Keep product in original container. Do not transfer into food or drink containers. Tightly reseal when empty for recycling. Always dispose of container in accordance with local, state, and/or federal regulations. Do not store this product below 50°F (10°C) or above 90°F (30°C).

Conditions of Sale: The information contained in this bulletin is believed to be accurate and reliable. Buyer and user acknowledge and assume all liability resulting from the use of this material. Follow directions carefully. Timing, method of application, weather, turf conditions, and other factors are beyond the control of the seller.

For Improved Root Structure and Vigor

HUMA GRO® TURF BREAKOUT™ is a unique blend of foliar nutrients, polysaccharides, and carbohydrates engineered to promote horizontal turf growth, build a stronger root system, and develop healthier turf. Micro Carbon Technology™ is included to ensure better deliverability of nutrients to plants.

Benefits of Use:

- Provides energy needed to push turf uniformly
- Promotes lateral development of root system
- Rapid fill-in of divots and ball marks
- Accelerates the emergence of turf
- Provides phosphorus needed to ensure root vigor and lateral development of turf and plants
- Can be used to acidify/buffer spray solutions (pH 1.7–2.7)

Deficiency Symptoms—When to Apply:

- Shallow root system
- Bare spots in turf
- Slow and/or poor growth

Application Instructions: SHAKE WELL BEFORE USING. Designed to be either soil and/or foliar applied. Contents are highly concentrated and must be diluted with water in a ratio of at least 20 parts water to 1 part product prior to foliar application. Best results will be obtained when application is concentrated in the active root zone or on the leaf surface. BREAKOUT™ can be applied in combination with compatible plant growth regulators, pesticides, or other liquid fertilizers. If compatibility is in question, jar-test a small quantity. Applications can be made as often as every 7 to 30 days as needed. See table below for specific rate instructions.

METHOD OF APPLICATION	Rate per 1,000 SF, 100 m ²	Rate per Acre, Hectare
Foliar broadcast spray or fertigated through sprinker system	Up to 2 oz/1000 SF, 70 mL/100 m ²	Up to 2 gal/ac, 5 L/ha
Soil broadcast spray incorporated	Up to 3 oz/1000 SF, 105 mL/100 m ²	Up to 3 gal/ac, 10 L/ha

Powered by **MICRO CARBON TECHNOLOGY** "This Product Contains Micro Carbon Technology", a proprietary blend of very small organic molecules that allows for more effective absorption of nutrients by plants.

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Turf Program Calculator

Work With a HUMA GRO® TURF Representative to Get Your Best Turf

Turf Issue(s)	Number of Acres / Hectares	Soil	I	II	III	IV
			HUMA GRO® TURF Product			
	Dates					
	Dates					
	Dates					



HUMA **GRO** **TURF**

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