

New Trends and Technology in Sports Turf

Featuring Representatives from STMA Commercial Companies:

DLF International Seeds

Grigg Brothers

Stadium Grow Lighting

Carolina Green Corp.

Redexim

LebanonTurf

Hunter

Ready Play Sports

Diamond Pro



Please Welcome DLF International Seeds



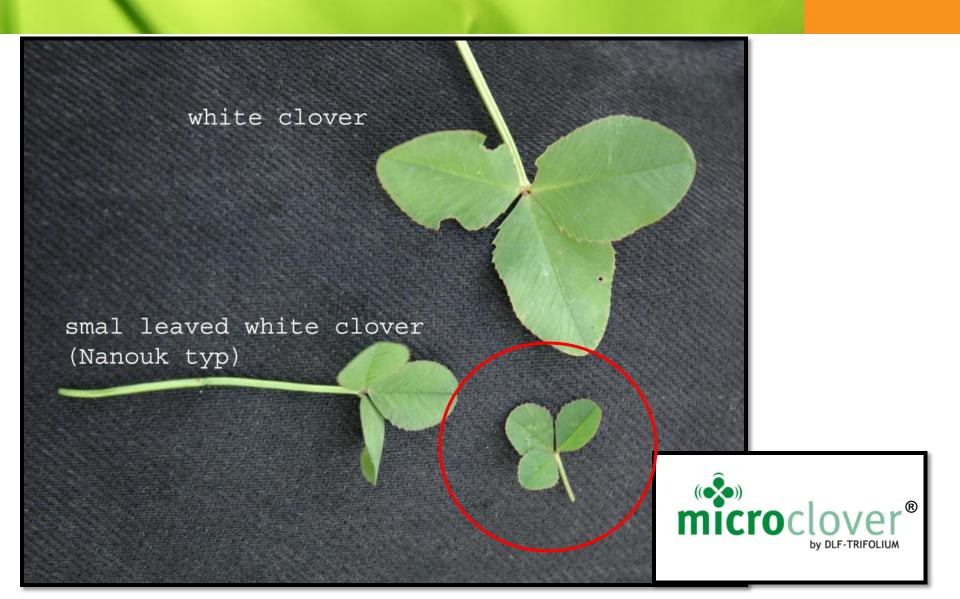
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TRENDS AND TECHNOLOGY SEMINAR MICROCLOVER® 2011









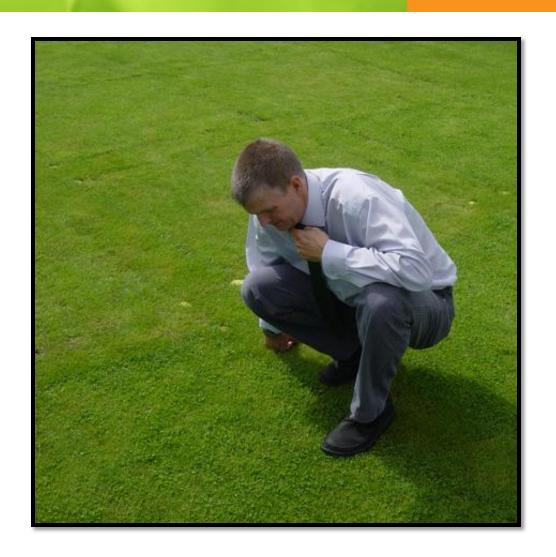


- Healthy and Lush
 - A green lawn with healthy grass and Microclover[®].
- Weed-Free Lawn
 - Weeds are prevented from establishing





- Tolerant to Close Mowing
 - With Microclover [®] the cutting height can also be "micro".





- Green Lawn all Year Round
 - Nothing compares to the ability of Microclover ® to stay green throughout the growing season and even during winter.



The picture was taken on January 10, 2005

Stays Green in Dry Periods







Environmentally Friendly

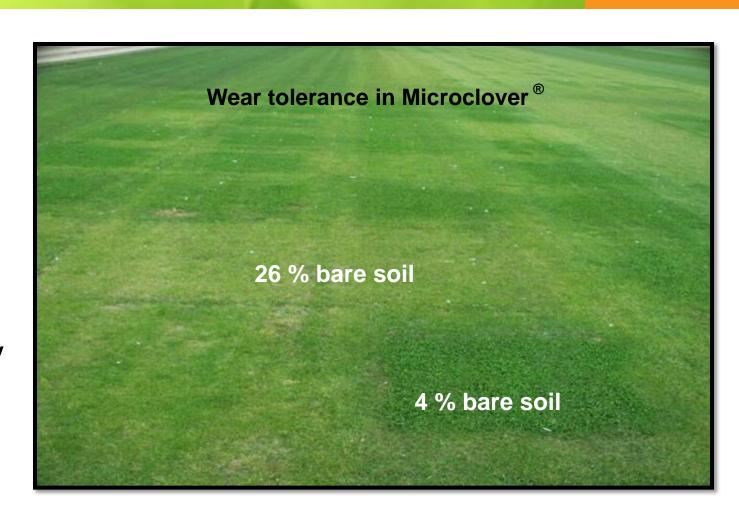
> - Less fertilizer and no spraying of fungicides.



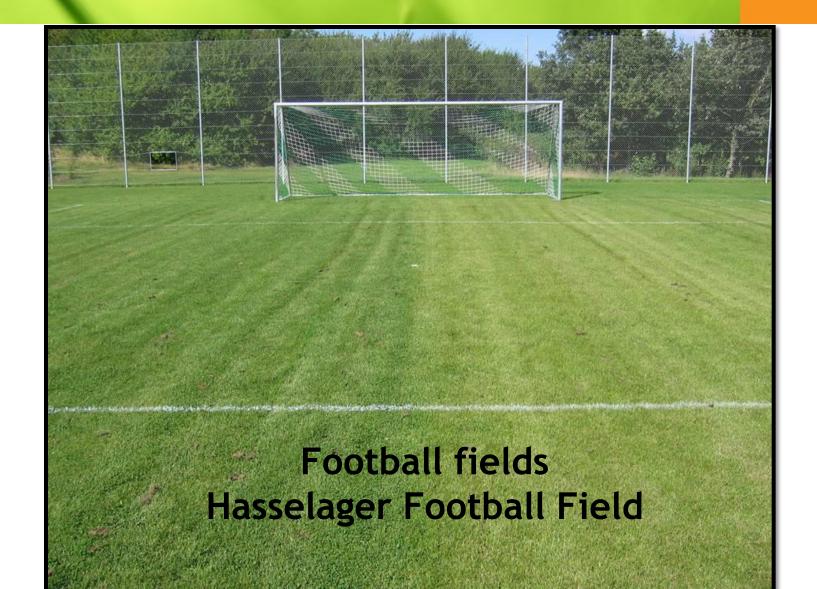
Recommended use of Microclover®



- Sports facilities
- Football fields in municipality











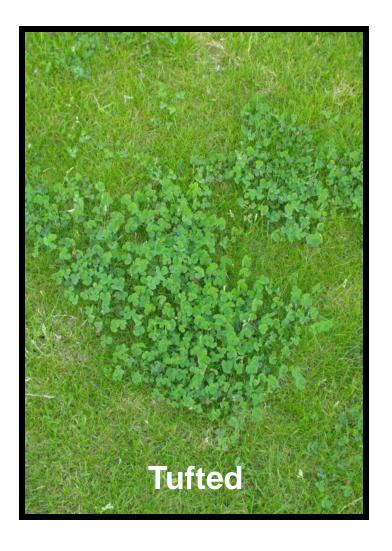
Spring view



















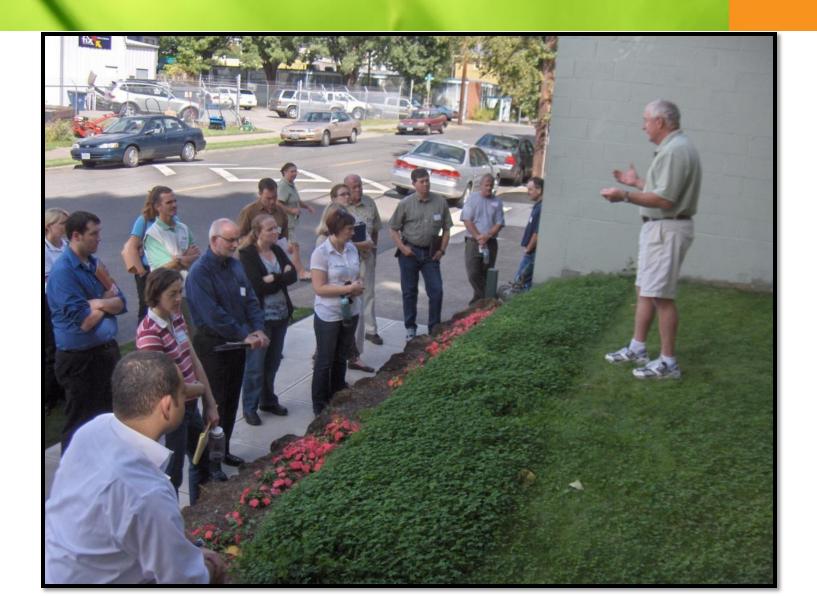




















Read more on www.microclover.com



Please Welcome Grigg Brothers



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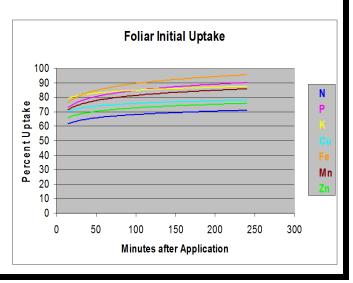
What Makes Grigg Brothers a Superior Foliar Fertilizer

Gary T Grigg CGCS, MG VP / Agronomist Grigg Brothers

and 16 years of independent university testing to provide you with 'Proven Foliars'

Science

- Univ of Nebraska, Michigan State Univ (Kevin Frank), Clemson University (Haibo Liu) & Univ of Florida (John Cisar)
- 3 Treatments
- 2 times of year (cool vs. hot)



Grigg Brothers proprietary chemistries make possible, in foliar nutrition, things that are not possible using conventional complexing and chelating technologies.

Prothers products are organic acids, amino acids and carbohydrates selected either individually or in combination to chelate each metal nutrient at the highest stability constant.

All Grigg Brothers chelating agents are natural plant metabolic compounds

We use NO synthetic compounds.

- Proprietary chelation technology based on nutrient profile of product
- Ratio's of chelating agents differ based on nutrient analysis – NO two are the same.

Iron for example requires different chelation factors than Manganese; Manganese requires different chelation factors than Zinc, etc.

- Many manufacturers use the same chelation or complexing mixture for all products (Fe, Mn, Zn, etc).
- This does not necessarily fully chelate all nutrients in their products.
- They can still put the word "chelated" on the label

Amino acids have become a "buzz word" but not all amino acids chelate equally. Amino acids, peptides, etc. from hydrolyzed protein (animal or plant) do not give the strongest chelation nor provide optimum uptake and translocation.

What Makes A Superior Foliar?

- Nutrients in Grigg Brothers that target photosynthesis are:
 - N, P, Fe, Mn, Mg, S, Zn
- In the photosynthesis formula, chlorophyll is the one variable that can be controlled
- An Increase in chlorophyll yields a net increase in carbohydrate production.

What Makes A Superior Foliar?

- All foliars vary the amount and speed of foliar absorption – ours are very fast
- The absorbed nutrient must be translocated throughout the plant
- Phytotoxicity can be a concern with some compounds – not with our chelates
- Proper pH foliars are best formulated as acidic, matching a plants natural chemistry
 - high pH products may be ineffective

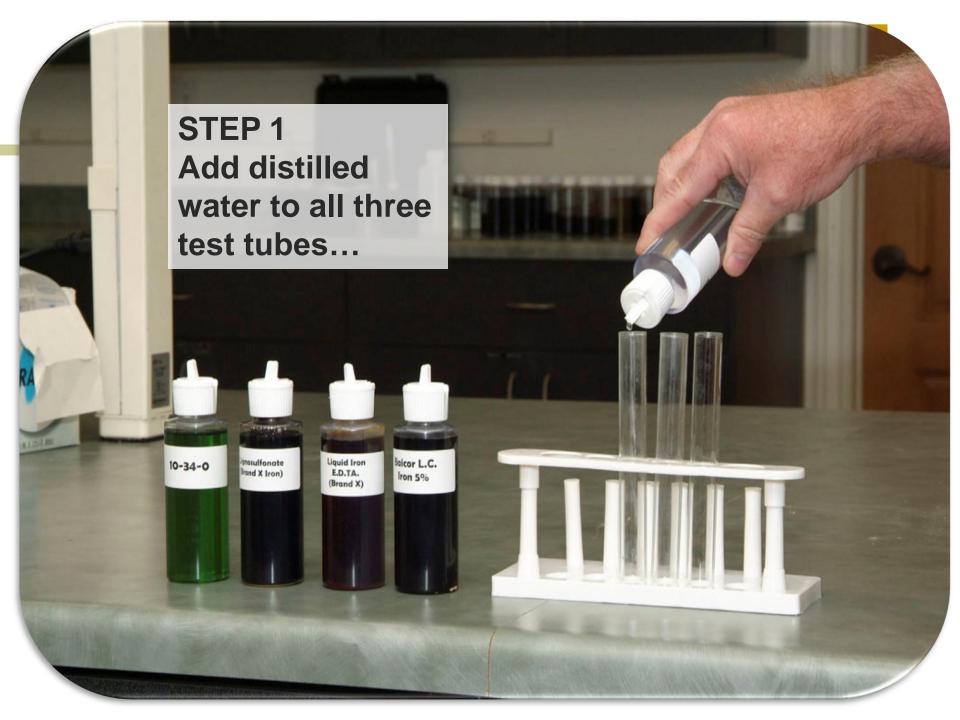
Why use the best chelated products?

- Compatibility and stability mixing with other nutrients, crop protectants, and PGR's.
- Protects nutrient from falling out (precipitating)
- Assist in plant uptake and translocation
- Plant safety

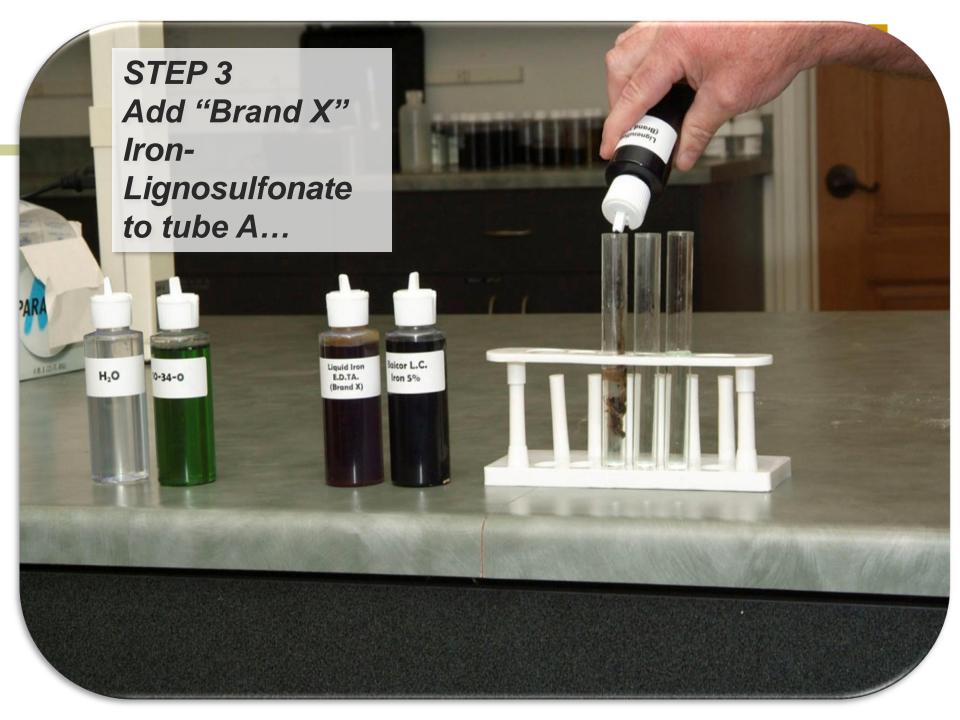
Why Grigg Brothers technology is superior

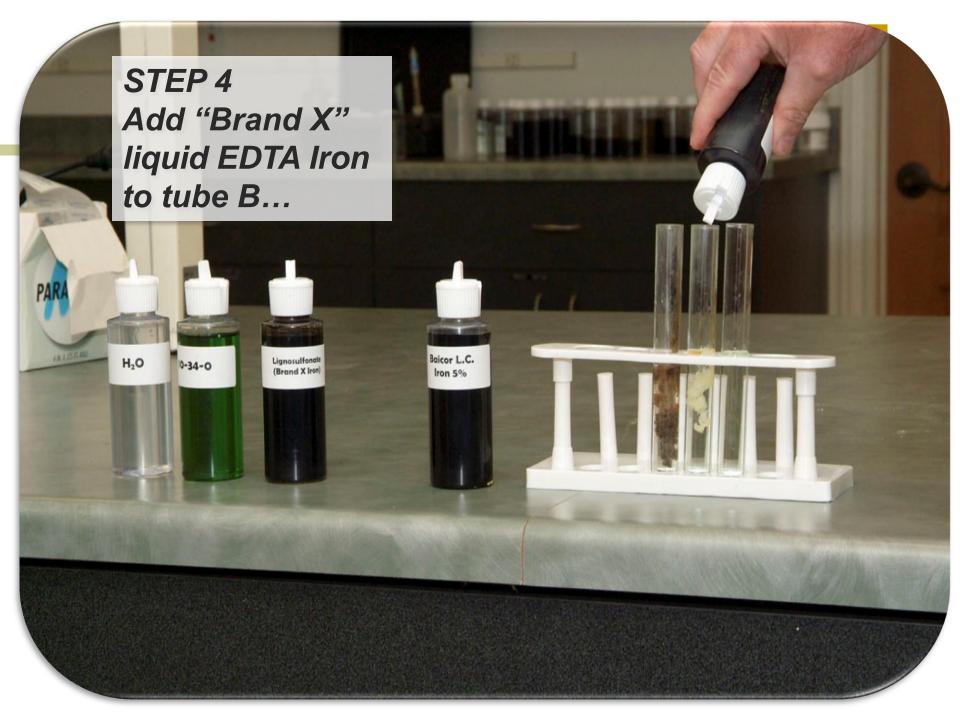


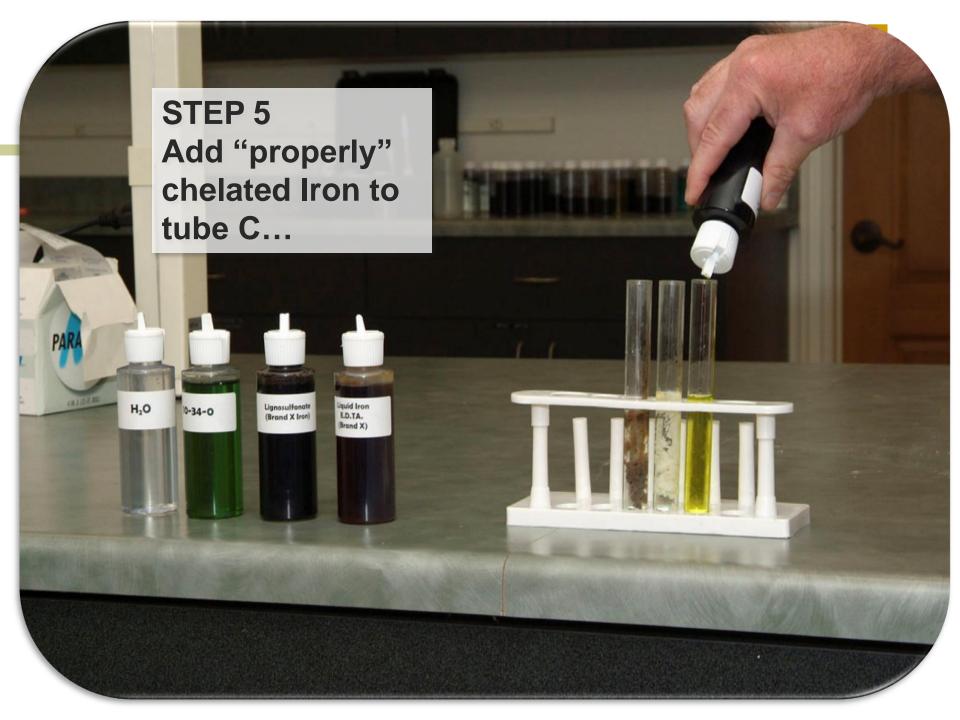
A Chelation Demonstration using Fe++ and P-













Established Superiority of Grigg Brothers

- Unique
- High Quality
- Effective / Efficient
- Predictable Performance
- Low Risk (tissue burn)
- Unsurpassed Product Compatibility
- Accelerated Turf Response
- Long Lasting
- Based on Sound Science



Please Welcome SGL



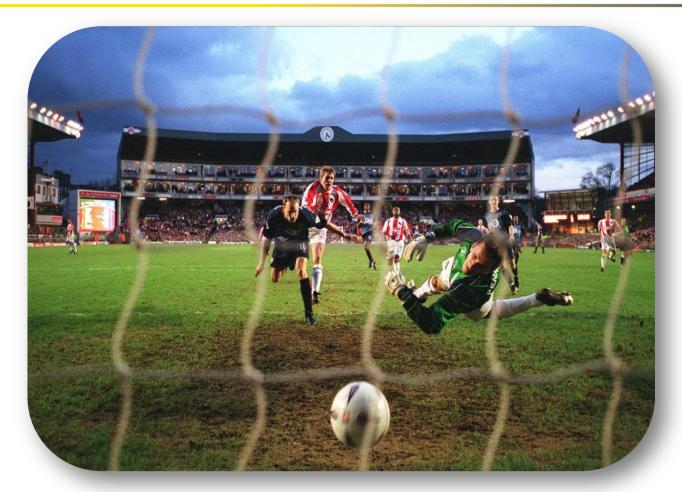
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HI-TECH GRASS SOLUTIONS





Results Arsenal
January 2003 - Without the SGL Concept





Results Arsenal March 2004 - Without the SGL Concept





Results Arsenal
January 2006 - With the SGL Concept





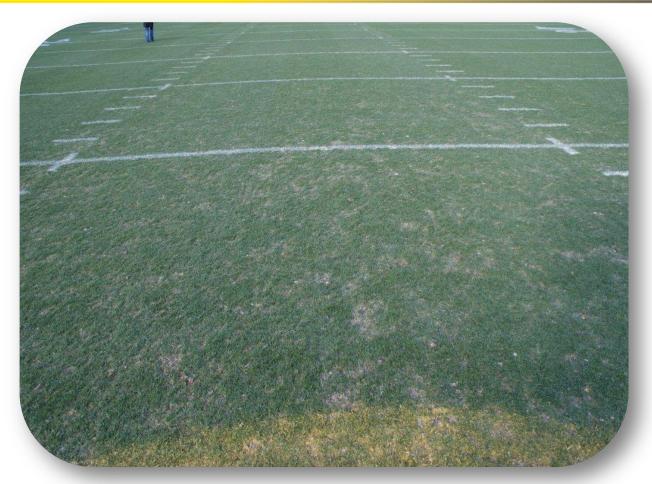
Results Arsenal
January 2009 - With the SGL Concept





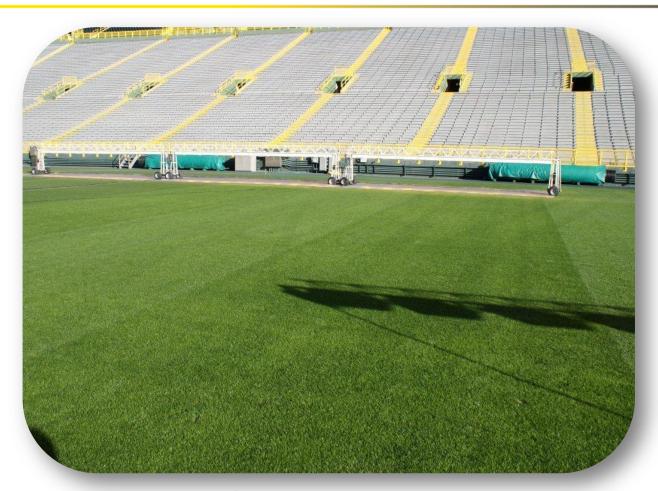
Results Green Bay Packers
November 2010 - With and without the SGL Concept





Results Green Bay Packers November 2010 - Without the SGL Concept





Results Green Bay Packers November 2010 - With the SGL Concept

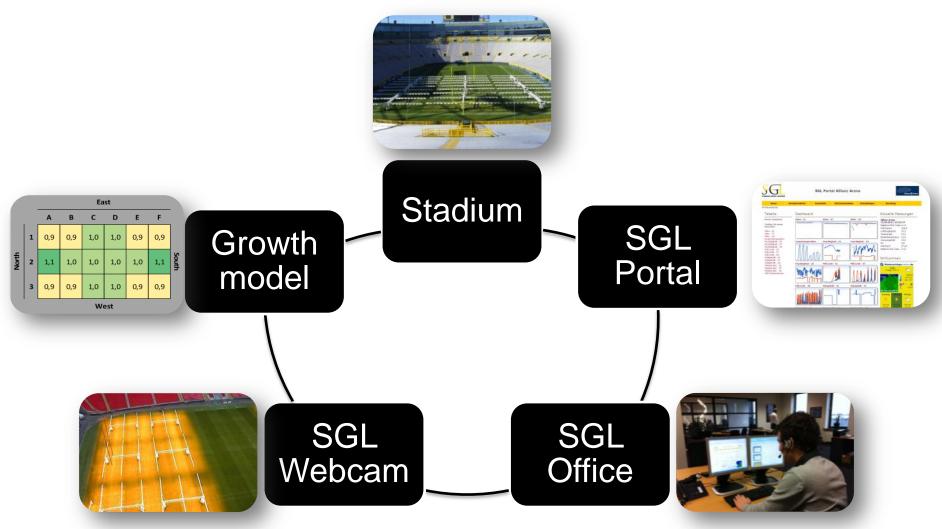




SGL Analyer



SGL Assist





Mobile Solution MU₃₆₀





Mobile Solution MU_{160}





Mobile Solution MU_{360FLEX}





Mobile Solution MU_{160FLEX}





Mobile Solution MU_{18} , MU_{27} , MU_{36} , MU_{50}



SGL Masterclass



Communication

Aducation

Networking



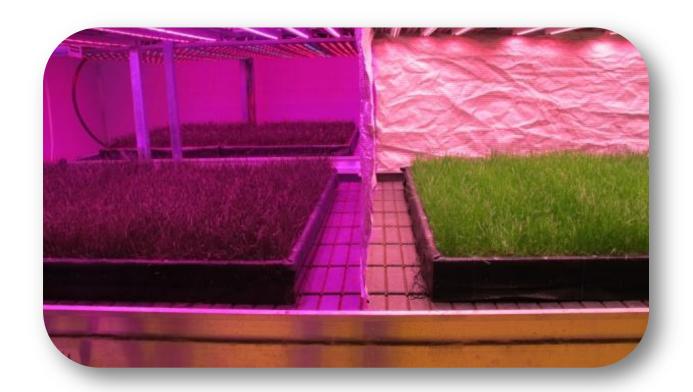
SGL R&D



STADIUM GROW LIGHTING

SGL Testcenter

SGL R&D



Research Philips





>90 Worldwide Projects | 23 countries September 2001 – January 2012



>90 Worldwide Projects





Please Welcome Carolina Green Corp.

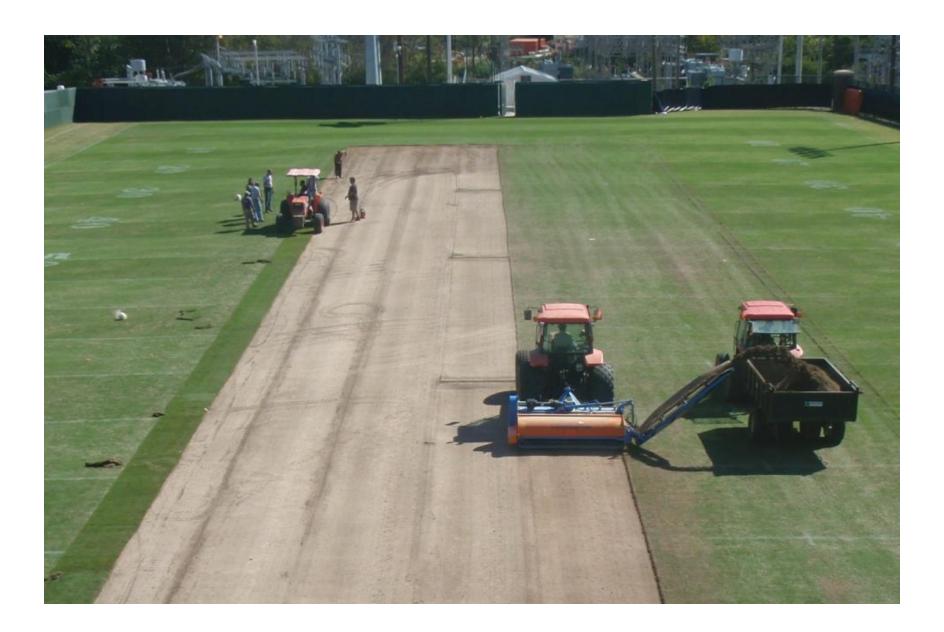


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SAND BASE SOD GROWN ON PLASTIC







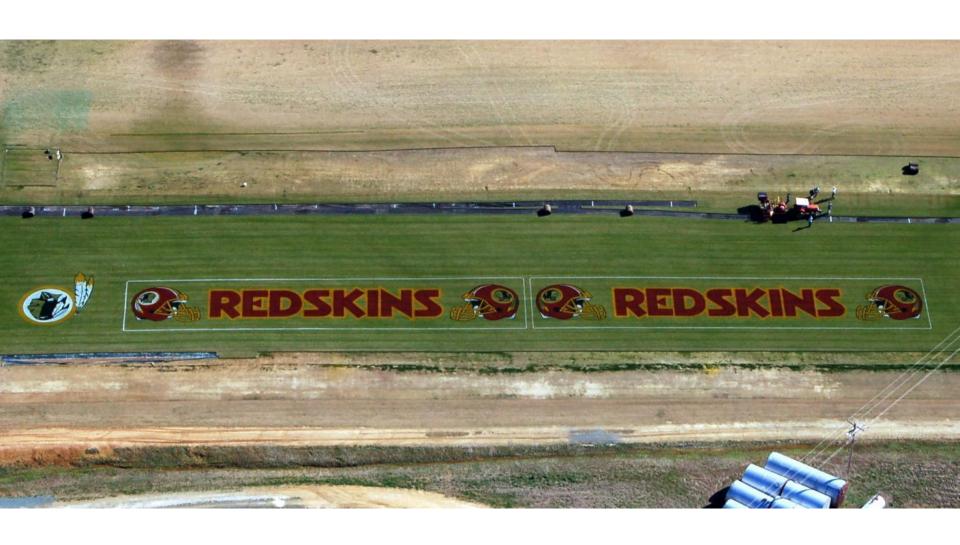




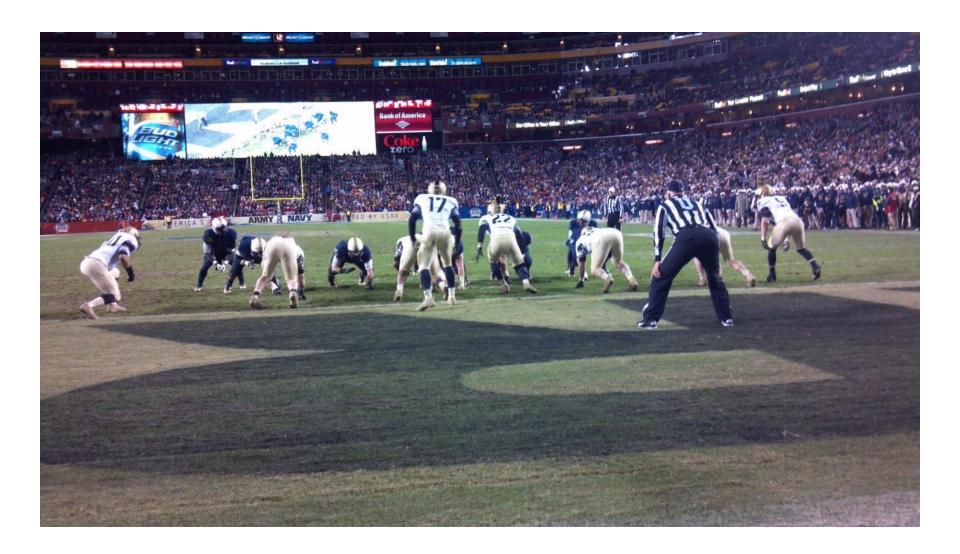




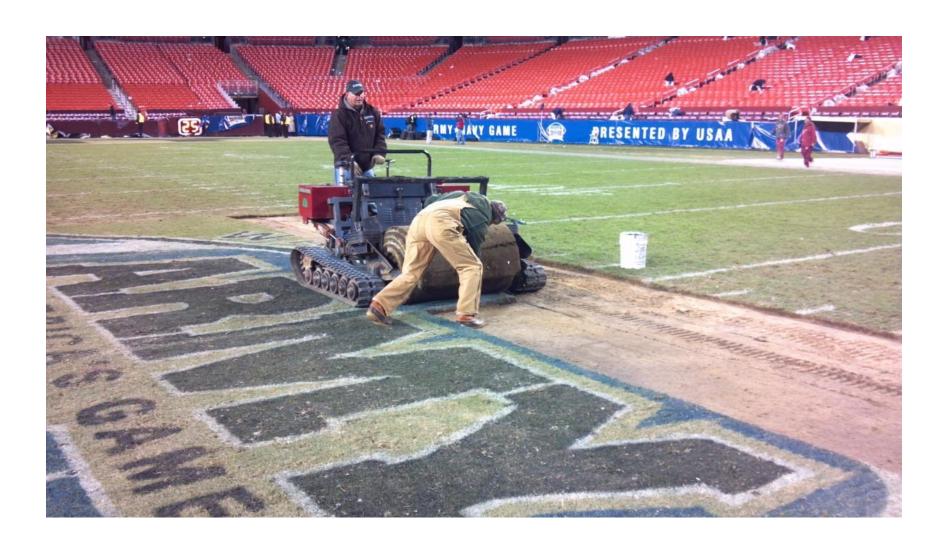






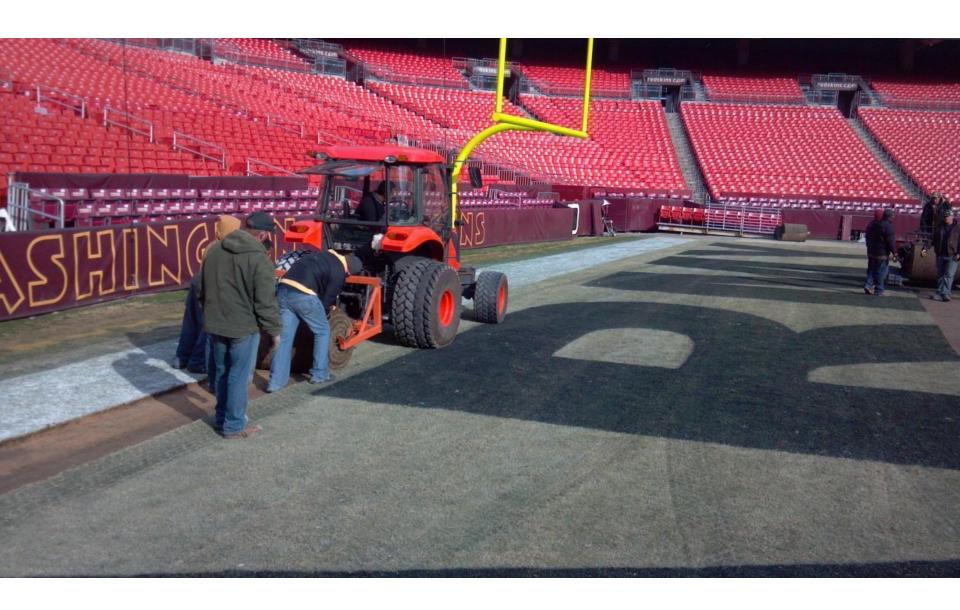


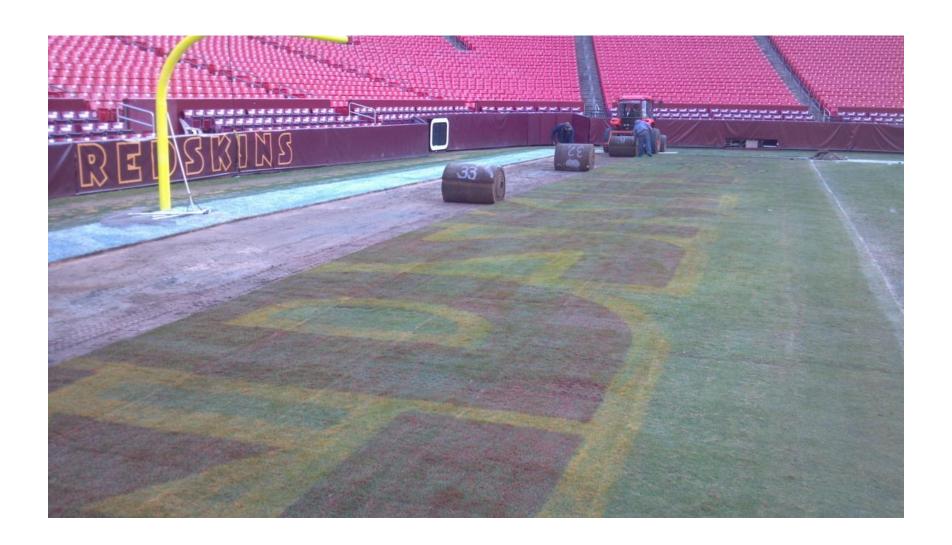






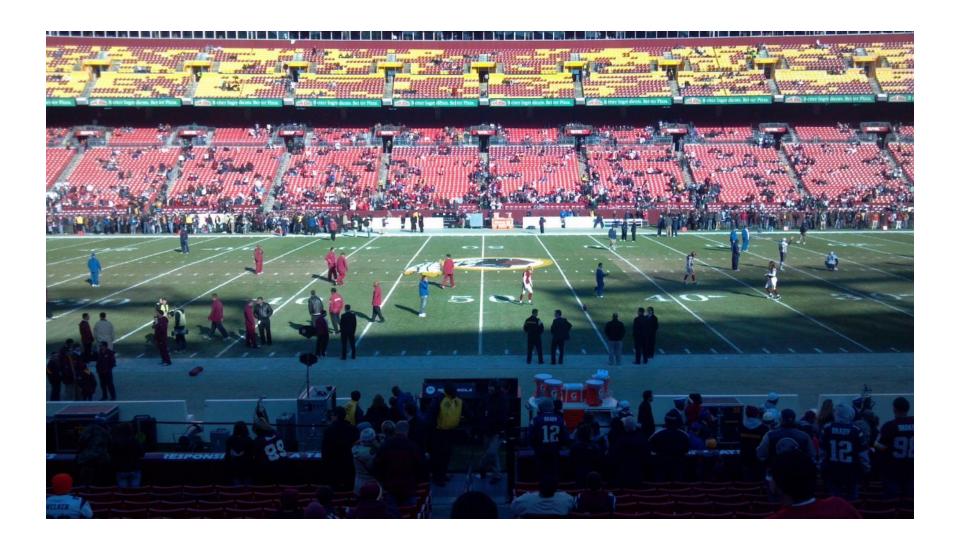














Please Welcome Redexim



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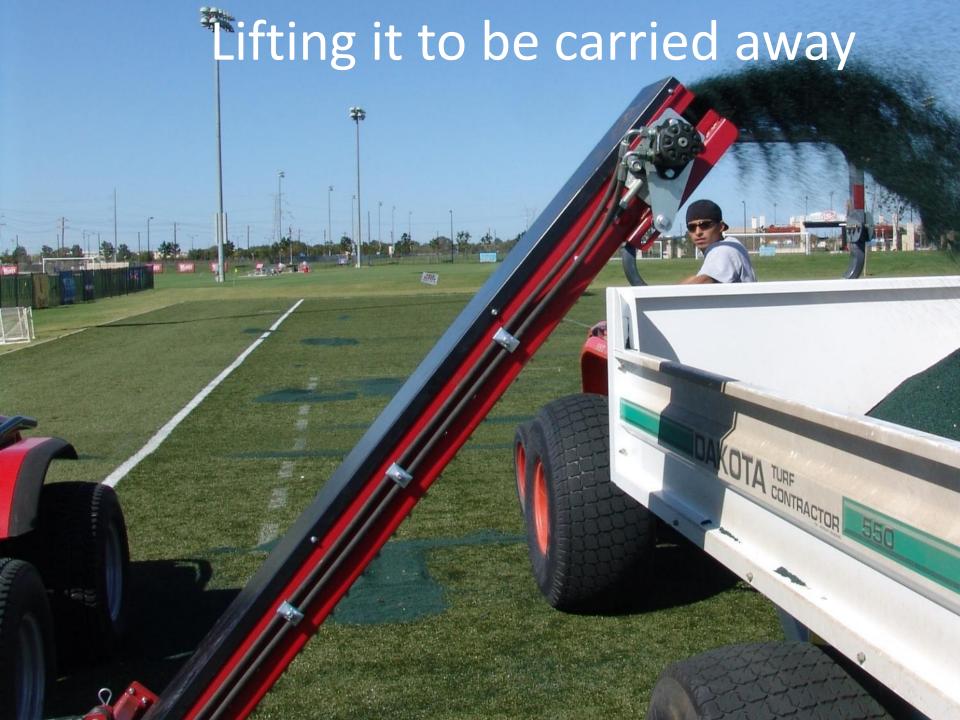
































Please Welcome LebanonTurf



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Product Technology Overview

Fertilizers – Biologicals























Technologies & Products

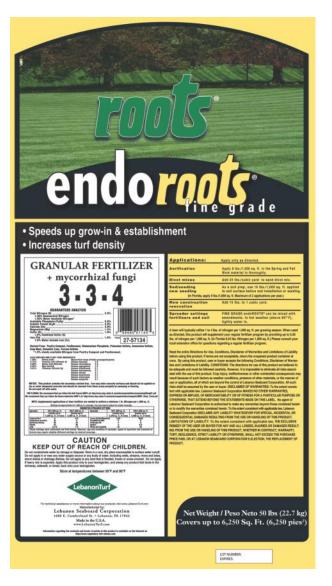
- Beneficial Organisms
- Biostimulants
- Chelated Micronutrients
- Patented Organic Granulation











ENDO ROOTS GRANULAR Mycorrhizal Roots stimulant

ROOTS ENDOroots 3-3-4

Organic fertilizers often have a wide variety of micronutrients to help meet the total nutrient needs of the plant

Ingredients:

- 9 Endo-Mycorrhizae Strains
- Biostimulant Package
- Macro and Micro nutrient package

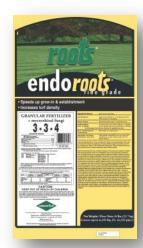


ROOTS ENDOroots 3-3-4

Organic fertilizers often have a wide variety of micronutrients to help meet the total nutrient needs of the plant

– Benefits:

- Soil and turf health
- Root Development
- Nutrient availability efficiency
- Drought & Salinity Tolerance
- Survivability



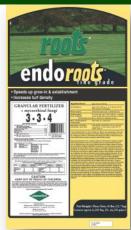


ROOTS ENDOroots 3-3-4

Applications:

- 7 10 lbs/1000 sq. ft.
- Aerification
- Sod installation
- Salinity management
- Seeding Overseeding & Hydroseeding
- Establishment

Organic fertilizers often have a wide variety of micronutrients to help meet the total nutrient needs of the plant





Biostimulant Technologies

- Biostimulants compounds
 - Vitamins for turf during stress periods
- Contents of biostimulants
 - Kelp extract (Sea Plant Extract)
 - Organic acids
 - Vitamins
 - Myo-Inositol
 - Sugars
 - Amino acids
 - Natural surfactants
 - Salicylic acid







Beneficial Organisms - Mycorrhizae

- Increases nutrient (P) and moisture availability
- Increases Calcium stability in the soil
- Extends the root surface area
- Soil aggregation
- Increases tolerance to stress





The Multiple Species Advantage...

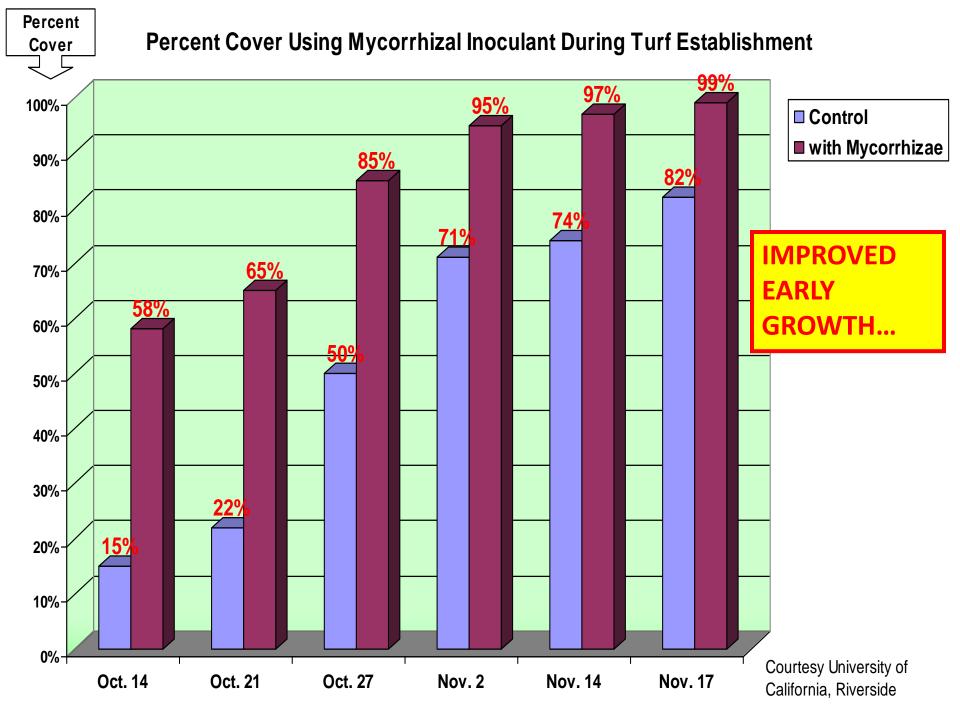












University of California - turfgrass research



Investing in Root Systems



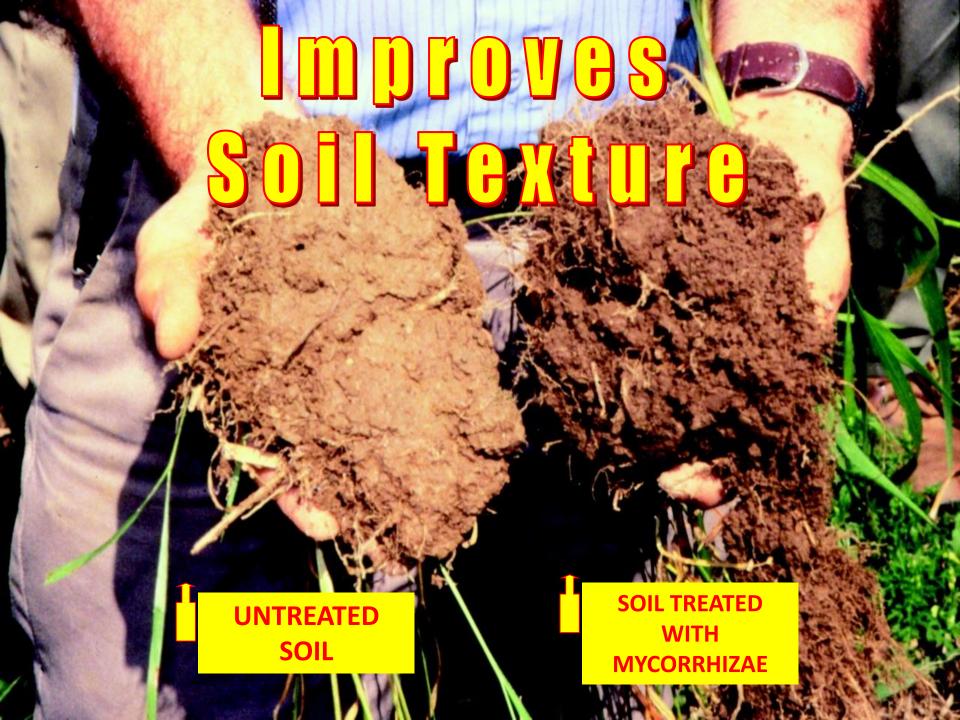


REDUCED IRRIGATION REQUIREMENTS:

THESE GRASS SAMPLES WENT SEVEN DAYS WITH A 40% WATER REDUCTION IN 90° – 100° F DAILY TEMPERATURES



MYCORRHIZAE







Please Welcome Hunter



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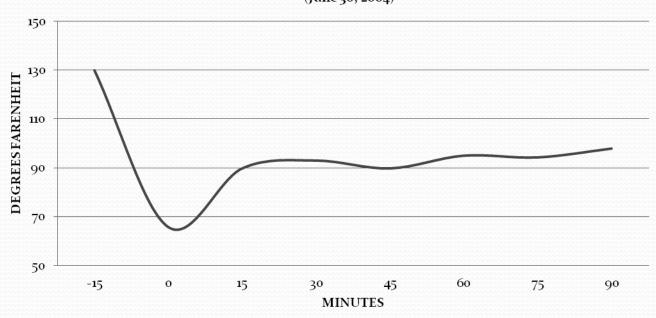
The Hunter ST System featuring STK-5 & STK-6

Rich Dunn
Product Manager
Golf & Large Turf Rotors
Hunter Industries, Incorporated

Why Synthetic Turf Irrigation

- To cool high heat generated by synthetic turf surfaces
- To clean/flush the synthetic turf surface

SURFACE TEMPERATURE CHANGE AFTER ONE IRRIGATION CYCLE (June 30, 2004)



(McNitt, Petrunak, 2007)



What is the ST System?

• The first and only integrated & cost-competitive solution designed from the ground up specifically for cooling and cleaning synthetic turf sports fields.





Why Choose The ST System?

- Simple to specify for the irrigation designer
- Straight-forward to install for the contractor
- Easy to maintain for the field manager over the years to come





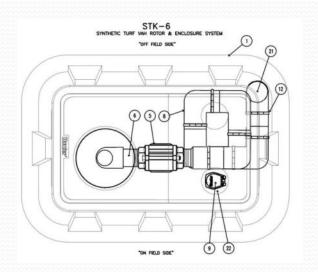


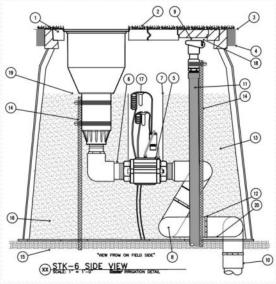


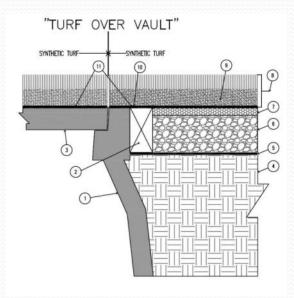


For The Irrigation Designer

- A "kit" of products that provide the complete solution
- Clear and specific installation details to help ensure the correct products are installed properly



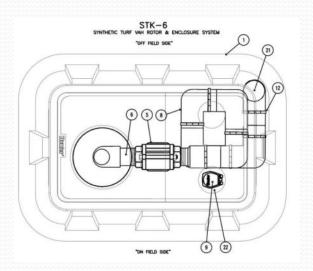


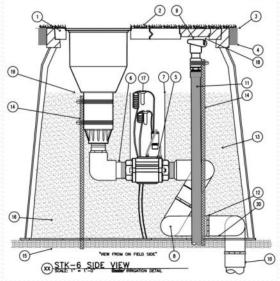


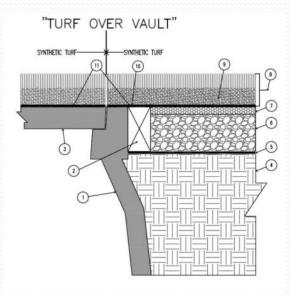


For The Irrigation Contractor

- Easy to source one-stop "kit" available from suppliers
- Clear and specific installation instructions to help ensure a clean and appropriate installation



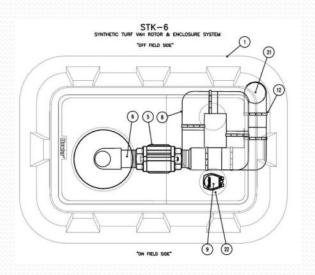


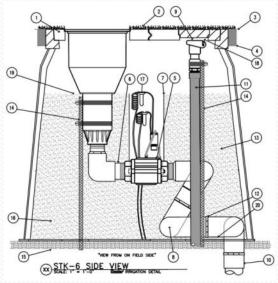


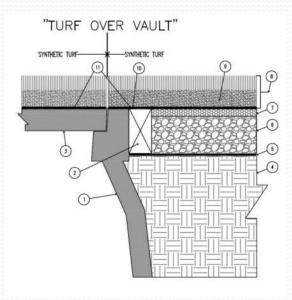


For The Sports Field Manager

- Robust and reliable set of system components
- Total & open access to all components within spacious vault allows servicing without cutting into the synthetic surface









ST System Rotors

- Up to 160 Feet Radius
- Smooth operating gear-driven rotors
- Adjustable arc & full-circle in one rotor
- Adjustable speed of rotation

ST-1600BR Riser Mount ST Rotor







ST System Rotors

- Heavy-duty brass & stainless-steel construction with sealed ball-bearings throughout
- Five nozzles included with every rotor
- Five-year component warranty
- Very competitively price

ST-1600BR Riser Mount ST Rotor







ST System Vaults

- Construction grade gusseted fiberglass body shell
- Three inch thick, 4-piece polymer-concrete cover set
- Polymer-concrete exposed upper rim



ST-243642B Vault System





ST System Vaults

- Pre-cast hole sized for the rotor
- Access port for quick-coupler
- Access port for On-Off-Auto selector



ST-243642B Vault System





ST System 3-Inch Swing Joint

- Seven O-ring sealed pivot points provide up, down, forward, backward and side-to-side articulation
- Multi-axis design allows perfect alignment of rotor & rotor elevation within vault's pre-cast rotor opening



Hunter

ST System 3-Inch Swing Joint

- Allows fine-tuning & adjustment of rotor elevation even after installation
- Results in smooth transition from rotor to vault & enhanced player safety
- 3-Inch size minimizes water velocity



3" Multi Articulating **Swing Joint**



ST System 3-Inch Valve

- Heavy-duty and super reliable cast iron construction
- Ultra low pressure-loss preserves precious pumping pressure

ST-V30K 3" Low Loss Valve





ST System 3-Inch Valve

Slow opening and closing feature enhances safety

Manual On-Off-Auto selector with remote mounting

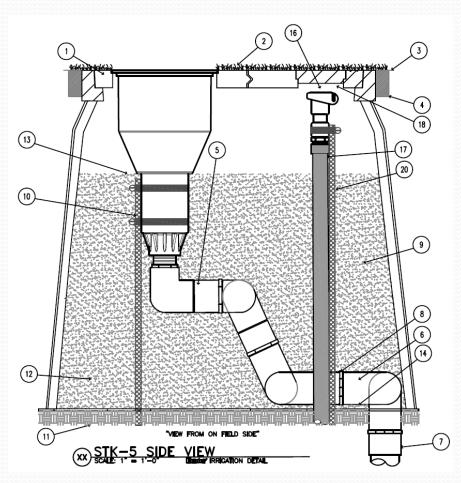
capability

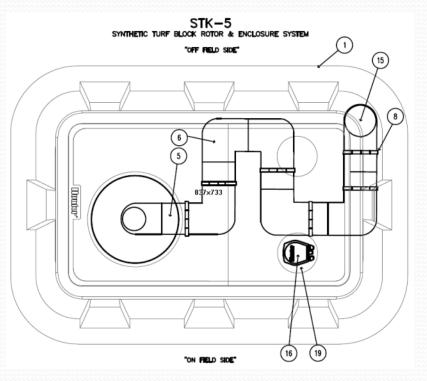
ST-V30K 3" Low Loss Valve





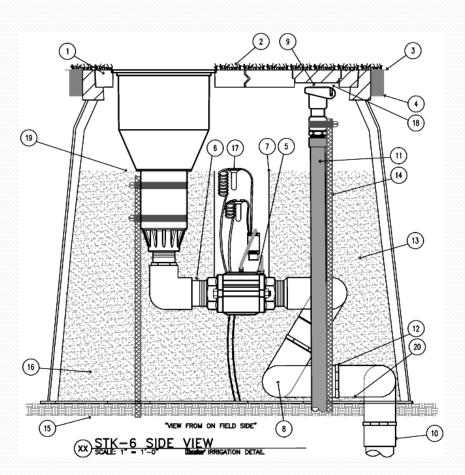
STK-5 Block System Kit

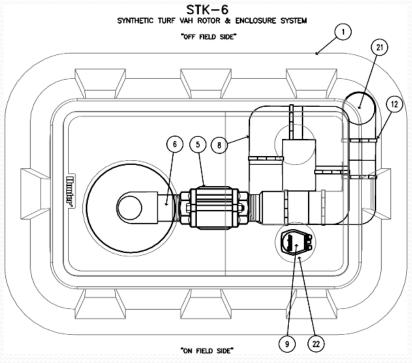






STK-6 Valve Adjacent Kit







ST System In Action





Irrigation Associate White Paper:

Irrigation Challenges & Opportunities Created by Modern Day Synthetic Turf Sports Field Surfaces

by Rich Dunn **Irrigation Associate White Paper:**

Irrigation Challenges & Opportunities Created by Modern Day Synthetic Turf Sports Field Surfaces

by Rich Dunn

To receive a copy of this document contact: Rich.Dunn@HunterIndustries.com



Please Welcome Ready Play Sports



Please click the mouse or the arrow key to advance to the next slide and begin the presentation.

AquaSmart Enterprises, LLC

&

Ready Play Sports

Water Conservation. Nutrient Savings.

Enhanced Growth.

Through Advanced Technology





AquaSmart Enterprises, LLC



- ▲ Company engaged in: Water Conservation, Nutrient Savings, and Enhanced Growth through the use of an advanced coating technology with applications in Agriculture, Horticulture, Turf, and Infield/Warning Track blends.
- ▲ AquaSmart has created advanced technologies through patent protection of a unique process for coating substrates with an exclusive superabsorbent polymer.

History of Polymers

- In the early 1960's, (USDA) conducted work on materials to improve water conservation in soils.
- In the 1970's, superabsorbent polymer was used commercially for the first time in disposable hygienic products.
- In the 1980's, superabsorbent polymers were reintroduced as soil amendments holding as much as 400x their weight in water, but many issues surfaced. These polymers were sodium neutralized, which held onto the moisture very tightly, thus would not release the water or nutrients.
- Recent advancements in superabsorbent polymers used in soil amendment applications involve cross-linked co-polymers, usually Potassium neutralized, which hold onto moisture and nutrients, but make them available to the plant as needed.

Challenges using Polymers

Absorption

- Controlling absorption: The ability to absorb up to 400X its weight in water can lead to drowning of plants and disease if too much water is held.
- Particle Size
 - Controlling application: It can be difficult to spread evenly and can create "hot spot" areas in soil. Drastic expansion can create unstable soil and uplift roots out of the ground. Cannot place on top of existing turf.

New Advancements in AquaSmart's Polymer

- **♦** Can <u>reduce watering</u> frequency by up to 50%³
- ♦ Can reduce nitrogen leaching & cut fertilizer usage by up to 50%⁴
- Plants have reduced oxidative stress at phyto-physiological levels, resulting in better growth and biomass production⁵
- 3. Water Management for Fescue Seedlings. Monterey Ag Resources, Fresno, CA, U.S.A. April 2010
- 4. Islam MR, Mao S, Xue X, Eneji AE, Zhao X, Hu Y (2011d). A lysimeter study of nitrate leaching, optimum fertilization rate and growth responses of corn (Zea mays L.) Following soil amendment with a water-saving superabsorbent polymer. J. Sci. Food. Agric., (Article in press)
- 5. Sishuai, Robiul, Yuegao, Xin, Fei, and Xuzhang. African Journal of Biotechnology Vol. 10(49), pp. 10000-10008, 31 August, 2011 Antioxidant enzyme activities and lipid peroxidation in corn (Zea mays L.) following soil application of superabsorbent polymer at different fertilizer regime

AquaSmart's Advanced Coating Technology

AquaSmart's intellectual know-how and patent protection is for a unique, innovative process for coating substrates with an exclusive superabsorbent polymer.

Absorption

• AquaSmart controls absorption: We can provide various absorption rates. Substrates coated to absorb 2X-20X their weight in water, preventing issues related to disease and the drowning of plants.

Particle Size

♦ AquaSmart controls application: Coating substrates allows for even distribution and eliminates "hot spots" and issues with unstable soil or uplifting of roots. AquaSmart creates a uniform moisture blanket to absorb the perfect amount of water and nutrients, and can also be placed on top of existing turf as a top dressing.

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Field MagicTM

- ▶ Field MagicTM, AquaSmart's superabsorbent sand, retains 12x its weight in water
- ♦ Releases water and nutrients as the plant needs it
- ♦ Can save up to 66% of customary watering
- Enhances growth of the plant
- Has lasted up to 7 years in the soil
- Biodegradable and Non-Toxic



Field MagicTM User Turf Growth



Day 7

Day 1

Field MagicTM User Turf Growth



Field MagicTM User Turf Growth

Top Dressed with 40lbs per 1000 sqft & Watered In





Day 1

Day 7

Day 21

Field MagicTM User Water & Fertilizer Savings



Field MagicTM User Water & Fertilizer Savings



Growing Media Stress Test

Day/Date	Weather	Water	Rose 1 (No AS)	Rose 2 (1/4 AS)	Rose 3 (1/3 AS)	Rose 4 (1/2 AS)
6/13-6/18	97F	5.5 in	No Stress	No Stress	No Stress	No Stress
6/19-6/26	93F	None	No Stress	No Stress	No Stress	No Stress
6/27	99F	None	20% Stress	No Stress	No Stress	No Stress
6/28	93F	None	20% Stress	No Stress	No Stress	No Stress
6/29	76F	None	30% Stress	No Stress	No Stress	No Stress
6/30	87F	None	30% Stress	No Stress	No Stress	No Stress
7/1	87F	None	40% Stress	No Stress	No Stress	No Stress
7/2	90F	None	50% Stress	10% Stress	No Stress	No Stress
7/3	93F	None	60% Stress	20% Stress	No Stress	No Stress
7/4	94F	None	70% Stress	20% Stress	No Stress	No Stress
7/5	95F	None	70% Stress	40% Stress	No Stress	No Stress
7/6	96F	None	90% Stress	50% Stress	10% Stress	No Stress
7/7	90F	None	99% Stress	60% Stress	20% Stress	10% Stress

Field MagicTM
Tomato Plant (6 weeks)



AquaSmart & 6-2-2 Fertilizer

6-2-2 Fertilizer

Baseball Field Surface



- New York Yankees
- Colorado Rockies
- Oakland A's
- San Diego Padres
- Seattle Mariners
- Arizona Diamondbacks
- University of Arizona
- ♦ Texas A&M

Field MagicTM

No Field MagicTM

Baseball Field Surface



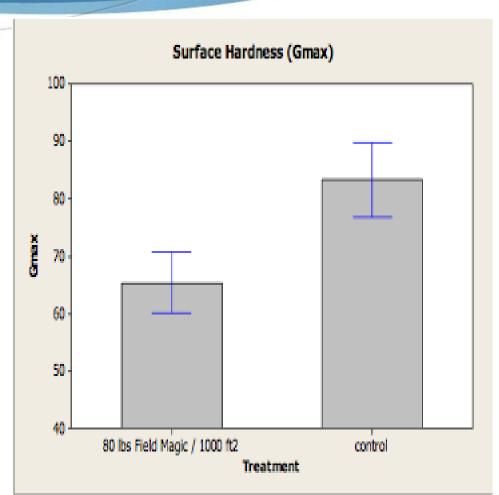
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- Arizona Diamondbacks
- University of Arizona
- ♦ Texas A&M

Field MagicTM

No Field MagicTM

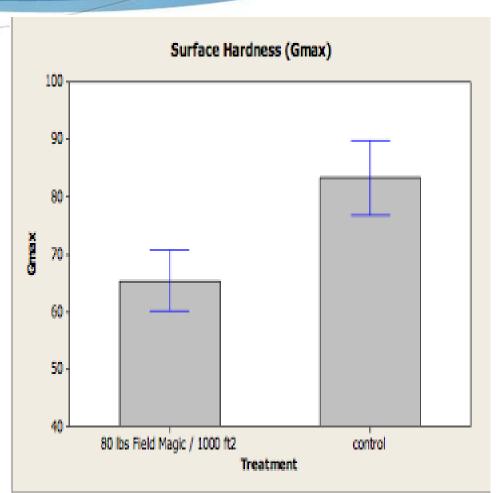
Penn State Surface Hardness Test

In this study, the surface hardness (Gmax) of research plots containing 80 lbs of Field MagicTM/1000 ft2 was compared to control plots. Surface hardness was measured using a Clegg Impact Tester (ASTM, 2010b), the same device used for NFL testing. The inclusion of Field Magic reduced Gmax from 83 g to 65 g compared to the control when hourly measurements were averaged over the course of one day of testing. This **22% reduction** may translate into reduced injury risk.



Penn State Surface Hardness Test

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THE FUTURE IS NOW

GREAT TURF!!!

♦ SAVE WATER!!!

SAVE FERTILIZER!!!



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