



AQUA·AID

SOLUTIONS



Solutions To Touch
Every Part Of Your
Agronomic Program



INNOVATIVE TECHNOLOGIES
CUSTOMIZED **SOLUTIONS**

AQUAAID.CA

Delivering Customized Innovations That Solve Turf And Ornamental Challenges By Improving Soil And Plant Health



Dedicated team of agronomic professionals offer technical expertise and common sense approaches



Unique technology supports agronomic programs while reducing environmental impact



Synergistic systems deliver long-lasting agronomic value and improve aesthetics and playability

Providing Best-In-Class Solutions For Management Of Key Elements For A Healthy And Sustainable Plant System



LIGHT

Required for photosynthesis to make the energy and compounds required to sustain life in a healthy and sustainable turfgrass system.



AIR

Required for root respiration, nutrient uptake and microorganisms to recycle nutrients for a healthy and sustainable turfgrass system.



WATER

Required in the proper amounts to maintain functional benefits of a healthy and sustainable turfgrass system and soil biology.



SOIL

Required to be balanced with air, water, and nutrients to allow these essential elements to be available to a healthy turfgrass system.

Solutions To Touch Every Part Of Your Agronomic Program

Table of Contents

MOISTURE MANAGEMENT SOLUTIONS

Branched Corrective

OARS HS	3
OARS PS	5

Corrective Hydration

OARS	6
------	---

Branched Hydration

PBS150	7
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SOIL SOLUTIONS

VERDE-CAL	9
VERDE-CAL G	10
VERDE-CAL K PLUS	11
TURF POWER	12
ACIDIPHY L	13
ACIDIPHY	14

RESOURCES

About Us	1
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Visit AQUAAID.CA for additional product information including labels and SDS.

Product Formulations



Liquid



Granular

MOISTURE MANAGEMENT SOLUTION

OARS HS

Hydrating Surfactant with Organic Acid Redistribution System

OARS HS, Soil Hydrating Surfactant, is a combination of the university researched, field proven, and patented organic acid redistribution system (OARS) with a multi-branched hydrating chemistry. **OARS HS** controls soil water repellency while providing uniform soil moisture and increased soil moisture retention.

- Removes humic coatings from hydrophobic soil particles
- Controls water repellency
- Increases number of hydrating sites to improve moisture retention
- Provides superior soil moisture uniformity
- Increased length of activity in soil
- Reduces drought stress
- Consistent performance between applications to maintain adequate moisture in hard to wet soils
- Money back guarantee

Golf, Lawns, and Sports Turf

Apply 130 to 160 ml in 8 L of water per 100 m² (4 to 5 ounces in 2 US gallons per 1,000 ft²) at 30 day intervals or as needed. After an initial 160 ml (5 ounce) application, drought conditions can be best managed by applying 60 to 80 ml in 8 L of water per 100 m² (2 to 2.5 ounces in 2 US gallons per 1,000 ft²) at 15 day intervals or as needed.



LIQUID

For extreme drought conditions with high temperatures and/or increased soil water repellency, apply 200 to 250 ml in 8 L of water per 100 m² (6 to 8 ounces in 2 US gallons per 1,000 ft²) at 30 day intervals or as needed.

Irrigate with sufficient water to deliver **OARS HS** to the soil profile - 3 mm (1/8 inch) or more recommended.



RESEARCH

Evaluation of two commercially available wetting agents on soil moisture management

Evaluation Time Frame: April 15, 2017 to July 14, 2017, 91 Days

Location: Penn State University, Berks Campus Agricultural Research Center

Treatments:

Trials were conducted on potted containers with a soil consistency of 70% sand and 30% soil planted with L-93 creeping bentgrass. Applications were made at label recommendations. Two applications of OARS HS regenerating multi-branched surfactant were made at 160 ml per 100 square meters. Two applications of an industry leading modified/methyl-capped block copolymer surfactant were made at 190 ml per 100 square meters.

Evaluation:

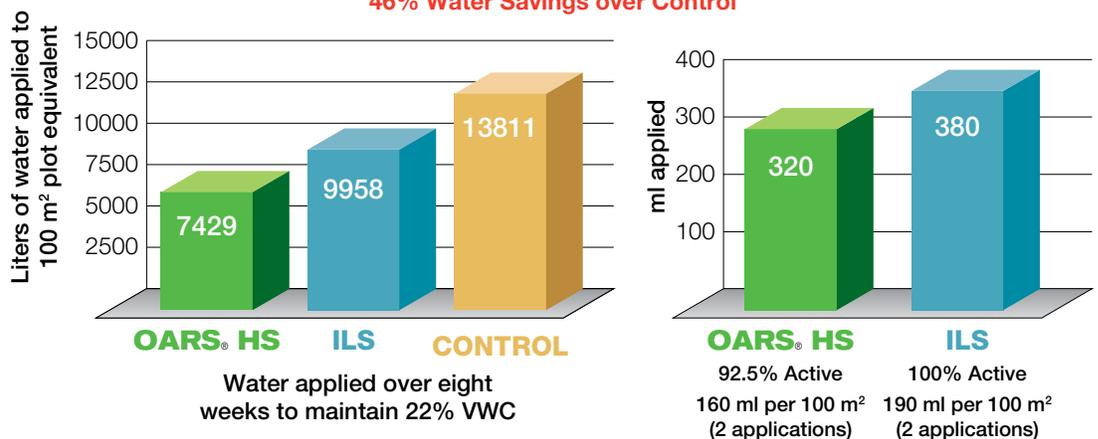
Evaluation of OARS HS regenerating multi-branched surfactant and an industry leading modified/methyl-capped block copolymer surfactant on soil moisture management of L-93 creeping bentgrass grown in a 70/30 sand to soil mix in potted containers. Target moisture level was 22% Volumetric Water Content (VWC). Rewetting of the matrix occurred once 15% VWC was measured. Both measurements were completed using a Spectrum TDR 300 Moisture Meter. The dry down was initiated on May 19, 2017.

Conclusion:

OARS HS pots required 46% less water than the control pots maintained at 22% VWC. 46% less water is equivalent to 6,382,903 liters saved for 10 hectares of fairways in an 8 week period. OARS HS outperformed the industry leading surfactant by saving 25% more water and required less watering cycles than the control.

Effect of OARS HS on Soil Volumetric Water Content (VWC) versus an Industry Leading Surfactant (ILS)

25% Water Savings over ILS with 16% Less Applied Product
46% Water Savings over Control



* Trials performed by Penn State University in 2017

OARS PS

Penetrating Surfactant with Organic Acid Redistribution System

OARS PS, Soil Penetrating Surfactant, is a combination of the university researched, field proven, and patented organic acid redistribution system (OARS) with a multi-branched penetrant chemistry. **OARS PS** controls soil water repellency while providing uniform soil moisture for a longer period of time.

- Removes humic coatings from hydrophobic soil particles
- Controls soil water repellency
- Provides superior soil moisture uniformity
- Increased length of activity in soil
- Improves water management efficiency
- Increases penetration of water
- Provides firm, fast surfaces
- Money back guarantee

Golf, Lawns, and Sports Turf

Apply 130 to 160 ml in 8 L of water per 100 m² (4 to 5 ounces in 2 US gallons per 1,000 ft²) at 30 day intervals or as needed. After an initial 160 ml (5 ounce) application, difficult to manage areas will respond best by applying 60 to 80 ml in 8 L of water per 100 m² (2 to 2.5 ounces in 2 US gallons per 1,000 ft²) at 15 day intervals or as needed.

For increased surface firmness, apply 200 to 250 ml in 8 L of water per 100 m² (6 to 8 ounces in 2 US gallons per 1,000 ft²) at 30 day intervals or as needed.

Irrigate with sufficient water to deliver **OARS PS** to the soil profile - 3 mm (1/8 inch) or more recommended.





OARS

Organic Acid Redistribution System

Research has proven that water repellency and LDS is caused by the buildup of organic acids (humic substances) in the top one inch below the thatch/soil interface. These organic acids are the result of dead plant material that builds up over a short period of time. Before the discovery of **OARS**, the only way to manage these organic acids was to mask their affect with a hydrating surfactant.

Because turf is aggressive and is continually growing, the buildup of organic acids is also continual. **OARS**' unique combination of a hydrating surfactant and organic acid solubilizer is the only chemistry that addresses water repellency at the cause.

OARS is the corrective approach to managing water repellency. Unlike other surfactants and soil amendments that just alleviate the symptoms of soil water repellency, **OARS** solubilizes the built-up hydrophobic organic substances allowing them to be flushed from the soil particle surface and provides 30 days of hydration.

- Uniform movement of water into and through the soil profile
- Patterns of wetting and re-wetting that will improve the amount of water in the soil to meet transpirational and metabolic demands of turfgrass
- Removes the cause of water repellency
- 30 day deep hydrating surfactant
- Provides a uniform soil moisture profile
- Creates a dryer playing surface
- The corrective approach to water repellency
- Money back guarantee

Golf, Lawns, and Sports Turf

Apply 200 to 230 ml in 8 L of water per 100 m² (6 to 7 ounces in 2 US gallons per 1,000 ft²) at 30 day intervals or as needed.

For increased penetration and surface firmness, apply 230 ml in 8 L of water per 100 m² (7 ounces in 2 US gallons per 1,000 ft²) at 15 day intervals or as needed.

Irrigate after each application to remove the surfactant from the plant surfaces.



LIQUID

MOISTURE MANAGEMENT SOLUTION



PBS150 is a long-term surfactant utilizing a unique multi-branched molecular structure to address the source of performance loss – biodegradation of the surfactant molecule by soil microbes. **PBS150** sustains a longer uniform soil moisture profile.

A uniform supply of water within the soil profile is critical during heat and water stress periods to meet the transpirational demands of the plant. Equally important, is the need for a uniform supply of water to turfgrass roots during a period of recovery and repair. Without a sustained supply of water, the turfgrass plant will be unable to rebuild its root system and carbohydrate (sugar) reserves (needed to survive dormancy and for subsequent new growth requirements).

The ability of **PBS150** to improve the uniform soil moisture status of turfgrass offers the turfgrass manager a highly flexible surfactant system from which to address these two critical periods of successful turfgrass management -- Heat and Water Stress and Turfgrass Recovery.

- Reduces hydrophobic conditions on a sustainable basis up to 5 months or more
- Encourages a pattern of hydration and re-hydration that improves the amount of available water in the soil profile to meet the metabolic demands of the plant
- Restores the uniform movement of water into and through the soil matrix
- Improves stress tolerance
- Money back guarantee

Fairways, Tees, and Sports Turf

100 Day Moisture Management: Apply two applications 15 days apart at 160 ml in 8 L of water per 100 m² (5 ounces in 2 US gallons per 1,000 ft²). Reapply 90 to 100 days after last treatment or as needed.



LIQUID

150 Day Moisture Management: Apply three applications 15 days apart at 160 ml in 8 L of water per 100 m² (5 ounces in 2 US gallons per 1,000 ft²). Reapply 120 to 150 days after last treatment or as needed.

Bunker Faces, Collars, Roughs, and Lawns

Apply two applications 7 to 10 days apart at 250 ml in 8 L of water per 100 m² (8 ounces in 2 US gallons per 1,000 ft²). Reapply after 120 to 150 days or as needed.

Irrigate with sufficient water to deliver **PBS150** to the soil profile - 1/8 inch (3 mm) or more recommended.

Fairways, Tees, Bunker Faces, Collars, Roughs, Lawns, and Sports Turf

Single Application: (75 Day Moisture Management)

Apply 2 kg per 100 m² (4 pounds per 1,000 ft²). Reapply after 60 to 75 days or as needed.



GRANULAR

Split Application: (150 Day Moisture Management)

Apply two applications 7 to 10 days apart at 2 kg per 100 m² (4 pounds per 1,000 ft²). Reapply a split application after 120 to 150 days or as needed.

Irrigation is necessary to release **PBS150** from the carrier. Irrigate before next mowing or leave baskets off.



RESEARCH

Evaluation of two commercially available wetting agents on soil moisture management

Evaluation Time Frame: March 30, 2016 to August 8, 2016, 132 Days

Location: Penn State University, Joseph E. Valentine Turfgrass Research Center

Treatments:

Trials were conducted on native soil fairways. Applications were made at label recommendations. Three applications of PBS150 regenerating multi-branched surfactant were made at 160 ml per 100 square meters. Three applications of an industry leading modified/methyl-capped block copolymer surfactant were made at 190 ml per 100 square meters.

Evaluation:

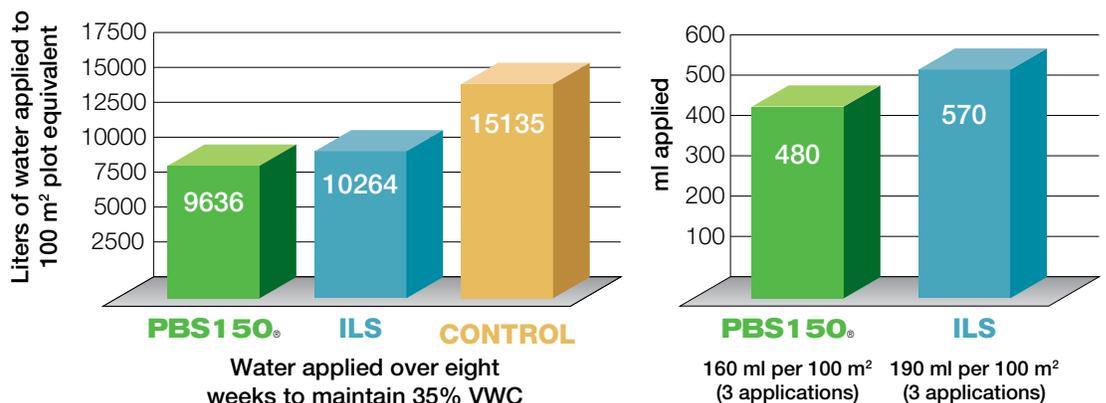
Evaluation of PBS 150 regenerating multi-branched surfactant and an industry leading modified/methyl-capped block copolymer surfactant on soil moisture management of an L-93 creeping bentgrass grown on a native soil fairway. Target moisture level was 35% Volumetric Water Content (VWC). Rewetting of the matrix occurred once 25% VWC was measured. Both measurements were completed using a Spectrum TDR 300 Moisture Meter. The dry down was initiated on June 8, 2016.

Conclusion:

PBS150 plots required 36% less water than the control plots maintained at 35% VWC. 36% less water is equivalent to 5,499,893 liters saved for 10 hectares of fairways in an 8 week period. PBS150 outperformed the industry leading surfactant by saving 6% more water and required less watering cycles than the control.

Effect of PBS150® on Soil Volumetric Water Content (VWC) versus an Industry Leading Surfactant (ILS)

6% Water Savings over ILS with 16% Less Applied Product
36% Water Savings over Control



* Trials performed by Penn State University in 2016

VERDE-CAL[®]

Enhanced Calcitic Limestone

Calcitic limestone combined with thCa™, an organic complexing agent, converts insoluble calcium compounds to soluble and available calcium. This allows for greater delivery of calcium to the exchange sites on the soil colloid.

- Reduces hydrogen, sodium, and chlorine in the plant and soil
- Improves germination, stimulates root growth, and enhances microbial activity
- Increases essential nutrient absorption and translocation
- Improves soil structure (flocculation, water infiltration)
- Supplies optimum calcium levels to plant cells to strengthen the plant's resistance to disease
- Balances the Ca/N ratio in the plant
- Quicker response at lower rates
- Requires 1/4 the rate of standard lime per application

Available in Greens grade (SGN 90) and Coarse grade (SGN 210)



GRANULAR

To maintain optimum pH and growing conditions, apply 250 kg/ha (5 pounds per 1,000 ft² or 220 pounds per acre) at least twice per growing season or as needed. Soil test recommendations should be used to determine liming needs.

To adjust pH, apply 500 kg/ha (10 pounds per 1,000 ft² or 435 pounds per acre). In most soils this will raise the soil pH up to one full point. Retest and if needed, reapply at the pH adjustment rate.



VERDE-CAL® G

Enhanced Gypsum

Calcium sulfate (gypsum) is combined with thCa™, an organic complexing agent. thCa makes the calcium in **VERDE-CAL G** more readily available for soil or plant use without affecting or raising pH.

- Leaches excessive amounts of sodium and magnesium from soil colloids
- Supplies calcium without raising pH
- Helps loosen compacted, heavy clay soils
- Supplies plant available sulfur in the sulfate form
- Improves soil aeration and water percolation
- Ideal for turf, shrubs, and flowers
- Quicker response at lower rates
- Requires 1/4 the rate of standard gypsum per application

Available in Greens grade (SGN 85) and Coarse grade (SGN 185)



GRANULAR

For continued optimum growing conditions, apply 250 kg/ha (5 pounds per 1,000 ft² or 220 pounds per acre) at 30 day intervals throughout the growing season or as needed. If desired, **VERDE-CAL G** may be applied at 500 kg/ha (10 pounds per 1,000 ft² or 435 pounds per acre) once or twice per growing season or as needed. Soil test recommendations should be followed.

To correct high sodium levels on Greens and Tees when using effluent water, apply 500 kg/ha (10 pounds per 1,000 ft² or 435 pounds per acre) at 30 day intervals throughout the growing season or as needed. A follow-up soil test is recommended and if needed, reapply at optimum growing conditions rate.

VERDE-CAL[®] K PLUS

Sulfate of Potash plus VERDE-CAL G

15%	Potash (K ₂ O)	7%	Calcium (Ca)
2%	Magnesium (Mg)	14.5%	Sulfur (S)
4%	Iron (Fe)	0.25%	Manganese (Mn)

Sulfate of potash blended with VERDE-CAL G (Enhanced Gypsum), thCa organic complexing agent, and L-Amino acids make **VERDE-CAL K PLUS** an ideal product that supplies essential nutrients of potassium, calcium, magnesium, sulfur, iron (from iron humate), and manganese all in one application. Great for periods of stress or monthly maintenance, **VERDE-CAL K PLUS** can be used on all turf and ornamentals.

- Provides premium potassium, magnesium, calcium, iron, and manganese
- Ideal source of sulfur
- Supplies calcium without raising pH
- Leaches excessive amounts of sodium and magnesium from soil colloids
- Micro particle for maximum coverage
- Ideal for all turf and ornamentals

Available in Greens grade (SGN 85) only

Apply **VERDE-CAL K PLUS** monthly or bi-weekly.



GRANULAR

For continued optimum growing conditions, apply 250 kg/ha (5 pounds per 1,000 ft² or 220 pounds per acre) at 30 day intervals throughout the growing season or as needed. Soil test recommendations should be followed.

When applying bi-weekly, apply 195 kg/ha (4 pounds per 1,000 ft² or 175 pounds per acre) every two weeks throughout the growing season or as needed.



Turf Power™

Plant Based Extract

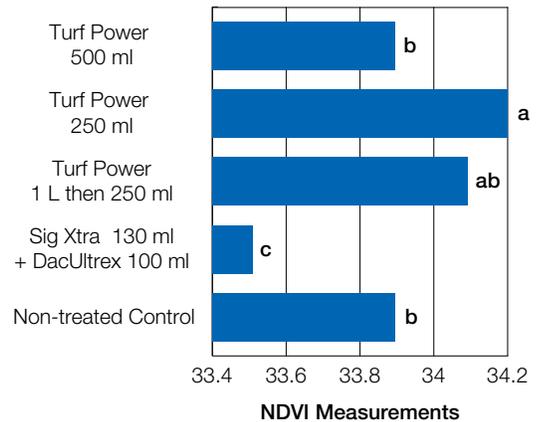
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From golf courses and city parks to school grounds and athletic fields, there is a broad range of turf management practices as there are uses for the turf itself. The one element that is universally important regardless of management practices or turf use is healthy soil.

Turf Power is a research backed product derived from plant based organic matter using a unique mesophilic process providing a humus rich liquid extract. **Turf Power** nourishes the soil, improves soil health and acts as a natural sequester enhancing availability and uptake of plant nutrients. Improved soil health increases strength of plants for better stress tolerance. **Turf Power** improves overall soil biology and nutrient availability producing stronger, healthier and more vigorous plants.

- Enhances availability and uptake of plant nutrients
- Viable source of macro and micro nutrients
- Increases water holding capacity of soil
- Accelerates overall plant development and stress tolerance
- Great tank mix partner with OARS PS, OARS HS, and PBS150
- Money back guarantee

Effect of Turf Power™ on Creeping Bentgrass Health



All NDVI measurements taken throughout the study are summarized as Area Under the Curve Values (AUCV)

Golf, Lawns, and Sports Turf Application

Apply as a soil spray at 250 ml in 8 L of water per 100 m² (8 ounces in 2 US gallons per 1,000 ft²) at 15 day intervals or 500 ml in 8 L of water per 100 m² (16 ounces in 2 US gallons per 1,000 ft²) at 30 day intervals. For best results, **Turf Power** requires season long application programs.



LIQUID

Foliar-Spray Application

Mix a 1:100 solution of **Turf Power** in water. Apply as a spray to cover the entire leaf canopy until running off.

AcidipHy® L

Irrigation Water Acidifier

AcidipHy Liquid is a unique blend of acidifying agents combined with a surfactant and manganese sulfate designed to be applied either through the irrigation system or in a tank spray. **AcidipHy Liquid** lowers the soil and soil solution's pH while utilizing and/or releasing soil nutrients that are present but previously not available to the soil or plants. **AcidipHy Liquid** enhances stress resistance by allowing the plant/soil to regain balance and release nutrients.

AcidipHy Liquid provides varying rates to allow for optimum effect based on soil/paste/water test data. Water and soil samples should be taken and analyzed on a routine basis by a reputable lab. Apply and immediately irrigate to field capacity to flush salts. **AcidipHy Liquid** may be applied monthly or as necessary to maintain desired salt and bicarbonate levels. Apply at a minimum dilution rate of 50 parts water to 1 part **AcidipHy Liquid**.

- Lowers pH of irrigation water and soil profile water
- Neutralizes the negative effects of high bicarbonate and carbonate levels in irrigation water and the soil solution
- Maintains the solubility of calcium and magnesium in irrigation and soil water
- Improves the ability of soil-applied calcium based amendments to produce soluble calcium
- Dissolves calcium carbonate and magnesium carbonate salts on the surface (crusting) and in the soil profile
- Money back guarantee

Golf, Lawns, and Sports Turf

Sprayable Application: Apply 30 to 90 ml in a 4 to 8 L of water per 100 m² (1 to 3 ounces in 1 to 2 gallons per 1,000 ft²) at 30 day intervals or as needed.

Irrigate with sufficient water to deliver **AcidipHy L** to the soil profile - 3 mm (1/8 inch) or more recommended.

Irrigation Injection Application: Based on irrigation water hardness, inject 10 to 85 L in 500 to 4,500 L of water per hectare (1 to 9 gallons in 50 to 450 gallons per acre) at 30 day intervals or as needed.



LIQUID

50 Bicarbonate ppm	10 L per hectare	(1 gallon per acre)
100 Bicarbonate ppm	20 L per hectare	(2 gallons per acre)
200 Bicarbonate ppm	37 L per hectare	(4 gallons per acre)
300 Bicarbonate ppm	55 L per hectare	(6 gallons per acre)
400 Bicarbonate ppm	75 L per hectare	(8 gallons per acre)
450 Bicarbonate ppm	85 L per hectare	(9 gallons per acre)



AcidipHy

Granular Soil Acid Treatment

Your soil will eventually take on the exact same characteristics as the water you irrigate with. When used on a consistent basis, **AcidipHy** granular soil acid treatment is the easiest, most efficient method to treat soil affected by poor water quality. **AcidipHy** gives you the power to manage some of the toughest agronomic problems.

AcidipHy is a proven, effective and very safe slow release granular acid technology. One application of **AcidipHy** provides 10X the neutralizing capacity as compared to typical liquid applications with NO PHYTOTOXICITY. **AcidipHy** is also very economical as a localized treatment versus liquid injection into water systems which treat the entire course. End users can treat smaller problem areas without the need for expensive injection equipment. **AcidipHy** provides the added benefit of KEY essential nutrients to help fight stress and prevent disease to fine turfgrass and ornamentals.

AcidipHy utilizes and/or releases soil nutrients that are present but previously not available to the soil or plants. **AcidipHy** lowers the soil and soil solution's pH. **AcidipHy** enhances stress resistance by allowing the plant/soil to regain balance and release nutrients. **AcidipHy** provides varying rates to enable the turfgrass manager to strengthen the agronomic program while meeting budget considerations and allow for optimum effect based on soil/paste/water test data.

For best results use in conjunction with VERDE-CAL G.

- Lessens the effects of poor water quality
- Increases nutrient availability
- Lowers soil pH
- Reduces the effects of elevated bicarbonates
- Flocculates soil structure and increase soil drainage
- Increases fertility longevity
- Reduces disease pressure
- Lessens turf stress
- Money back guarantee

Golf, Lawns, and Sports Turf

To maintain desired sodium and bicarbonate levels, apply the suggested rate at 30 day intervals or as needed. Irrigate immediately after application to field capacity to maximize bicarbonate and salt flushing.



Do not exceed 730 kg (15 pounds) per application.

120 Bicarbonate ppm	200 kg per hectare	(4 lb per 1,000 ft ²)
240 Bicarbonate ppm	400 kg per hectare	(8 lb per 1,000 ft ²)
360 Bicarbonate ppm	600 kg per hectare	(12 lb per 1,000 ft ²)
450 Bicarbonate ppm	730 kg per hectare	(15 lb per 1,000 ft ²)



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