



W.S.CONNELLY & COMPANIES

LANDSCAPE SUPPLY, INC.

ENVIRONMENTAL CONSTRUCTION SOLUTIONS

CHESAPEAKE VALLEY SEED

TENBARGE

HYDRASMART

PRESCRIPTION TURF SERVICES



Turf, Ornamental and Landscape
SOLUTIONS MANUAL

www.wsconnelly.com

W.S. CONNELLY FAMILY OF COMPANIES



Chesapeake Valley Seed

Grow perfect turf with Chesapeake Valley Seed. Professional groundskeepers, lawn and landscape providers, sod producers, sports field managers and all those working in the grassing business turn to us for exceptional products and service — we offer exactly what you need, right when you need it.



Environmental Construction Solutions

Solutions-driven and service-minded, Environmental Construction Solutions is the leading construction supply company in the Mid-Atlantic region. Begun as an installation company, we understand the challenges of sediment control, storm water management and the geosynthetic world, and we've been helping engineers and contractors find solutions for more than 30 years.



HydraSmart

High-tech meets high-growth and strength in Hydrasmart's proprietary liquid fertilizers, spray adjuvants, and soil surfactants. Our nationally recognized, university proven, scientifically manufactured solutions are developed on the principles of integrity, transparency, safety and the highest performance.



Landscape Supply

From sport complexes to golf courses, Landscape Supply is committed to providing you with both economic and agronomic solutions. One of the most well-respected turf and ornamental distribution businesses in the country, we have served the mid-Atlantic region for more than 60 years.



Prescription Turf Services

Prescription Turf Services (PTS) offers golf course superintendents access to highly accurate custom fertilizer application to save them time and money. We spread lime, fertilizer, soil amendments, and grass seed throughout the mid-Atlantic region, providing turf managers with excellent service born from decades of experience.



TenBarge Seed

For 80 years TenBarge Seed has been a leading distributor of grass seed, fertilizer, and chemicals for the golf course, sports turf, lawn care, landscape management, and arbor care industries. Our products are shipped all around the Ohio River valley, including Indiana, Kentucky, Tennessee, Michigan, and Ohio. TenBarge Seed remains focused on customer service, product innovation and best in class staff; the same three pillars which helped start TBS some 80 years ago.

TABLE OF CONTENTS

W.S. Connelly Family of Companies	2
Table of Contents	3
HydraSmart & Foliar Nutrition	4-6
Foliar & Soil Nutrition	7
Water Soluble Fertility	8
Soil Nutrition	9
Slow Release Sources of Nitrogen & Potassium	10
Starter Fertilizer	11
Organic Granular Fertility	12-13
Synthetic Fertility	14
Fertility with Control Products	15-16
Ornamental Fertility	17-18
Greens Grade Fertility	19
Surfactants & Adjuvants	20-21
Direct Plant Protection Partners	22
Fungicide Solutions	23-25
Disease Guide	26-27
Herbicide Solutions	28-30
Herbicide Quick Reference	31
Herbicide Glossary	32
Grassy & Broadleaf Weed Guide	33
Insecticide Solutions	34
Insect Guide	35-36
Plant & Turf Growth Regulators	37
Organic Pesticides	38
Colorants & Pigments	39
Soil Amendments	40-41
Sports Turf Solutions	42-44
Sports Turf Soil Amendments	45
Premium Grass Seed	47-49
Erosion & Sediment Control	50
Tools & Landscape Installation	51
Weights & Measures	52
Notes	53-55
Agronomic Glossary	56-57
Who Are We & Where Do We Come From	58
Our Locations	59

HYDRASMART SOIL & FOLIAR NUTRITION



Hydra-Fuse 18-0-6

A core fertility foliar NPK combined with phosphite and proprietary biostimulants derived from desert plant extracts. Designed to provide a consistent and lasting color response while enhancing stress resistance and encouraging root growth. Hydra-Fuse contains 6% potassium derived from Potassium Acetate (KA) for superior foliar uptake. Hydra-Fuse's 50% Triazone N provides a tremendous color response with a predictable growth curve. Low salt index. No phosphates. No nitrates. No chlorides.

Rates:

Cool Season: 3.0 - 8.0 oz./1000 sq. ft.
Warm Season: 3.0 - 8.0 oz./1000 sq. ft.
Ornamental: 1.0 - 4.0 qts./100 gal.
Root Injection: 1.0 - 2.5 gal./100 gal.

Hydra-Cal

Hydra-Cal is a highly active 3-way blend of acetate, nitrate, and chelated forms of calcium. Hydra-Cal contains a unique bio-stimulant technology derived from desert plant extracts designed to increase plant health and root growth. The combination of highly efficient foliar uptake, root absorption, and chelated calcium maximizes calcium delivery to the leaf tissue as well as to the roots. The addition of boron and magnesium further enhances cell wall strengthening and chlorophyll production. Plant available silica enhances the physical strength and stress resistance of the plant.

Rates:

Cool Season: 1.5 - 3.0 oz./1000 sq. ft.
Warm Season: 1.5 - 3.0 oz./1000 sq. ft.
Ornamental: 2.0 - 4.0 qts./100 gal.

Hydra-Fe Combo 12-0-0

Give your plant more than just Iron. 6% Fe, 2% Mn, 0.25% Mg. Rapid color response from urea nitrogen and organic acid complexed micronutrients. Because of the scientifically formulated ratio of iron, manganese, and magnesium, Hydra-Fe enhances photosynthesis through nutrition, specifically creating a dramatically enhanced green-up, far more noticeable than the many iron products on the market. Hydra-Fe is amine compatible with reduced risk of staining.

Rates:

Cool Season: 2.0 - 8.0 oz./1000 sq. ft.
Warm Season: 2.0 - 8.0 oz./1000 sq. ft.
Ornamental: 1.0 - 4.0 qts./100 gal.
Root Injection: 1.0 - 4.0 qts./100 gal.

Hydra-Phite Plus 0-0-28

A highly concentrated potassium phosphite, Hydra-Phite Plus contains proprietary bio-stimulant technology derived from desert plant extracts, which increases plant strength and growth. In addition, the SAR (systemic acquired resistance) elicitors increase plant vigor and trigger plant defense responses, making the turf stronger even during the most stressful periods of the season. With Hydra-Phite Plus's highly synergistic combinations of desert plant extracts, phosphite and SAR elicitors, the turf becomes impressively resistant to plant stress, while enhancing turf quality.

Rates:

Cool Season: 3.0 - 4.0 oz./1000 sq. ft.
Warm Season: 3.0 - 4.0 oz./1000 sq. ft.
Ornamental: 0.5% solution v/v

Hydra-Kelp 4-0-0

A supplemental nitrogen and micronutrient fertilizer designed to prevent and/or cure nutrient deficiencies in plants and crops. Hydra-Kelp is enhanced with Ascophylum Nodosum extracts to enhance turfgrass quality. Hydra-Kelp is a pure biostimulant that ensures your turf has the antioxidants it needs to prepare for summer stress conditions. Hydra-Kelp's overall result is a boosted defense system, carbohydrate reserves for the turf and the infusion of high levels of naturally beneficial cytokinins. As a secondary benefit, Hydra-Kelp contains 1% Mg, 2% Fe, and 1% Mn to provide a tremendous color response.

Rates:

Cool Season: 1.5 - 6.0 oz./1000 sq. ft.
Warm Season: 1.5 - 6.0 oz./1000 sq. ft.
Ornamental: 1.0 - 4.0 qts./100 gal.
Root Injection: 1.0 - 4.0 qts./100 gal.

Hydra-Fense 12% Silica

Hydra-Fense 12% plant available silica forms deposits in the cuticle, which provides a physical resistance to stress. During the process, Hydra-Fense accelerates greater rooting and tougher, stress resistant tissue for optimized plant health, performing above and below the soil surface. Easy to use, tank mix stable, clear, pH balanced and highly concentrated. Reduced ball marks, reduced wear, faster greens, and better cut.

Rates:

Cool Season: 1.5 - 3.0 oz./1000 sq. ft.
Warm Season: 1.5 - 3.0 oz./1000 sq. ft.

Hydra-Mn Combo

4% Mn, 3% Fe, 1% Mg. with complexed organic acids. Hydra-Mn is specifically designed to provide the right nutrients to deliver elevated tissue color. The combination of Mn, Fe and Mg in the organic acid chelated form catalyzes the reactors inside the plant to produce unrivaled color response, regardless of soil conditions such as pH. Flexible for foliar and soil applications. Compatible with amine-based herbicides and offers low stain risk.

Rates:

Cool Season: 1.5 - 3.0 oz./1000 sq. ft.
Warm Season: 1.5 - 3.0 oz./1000 sq. ft.
Ornamental: 2.0 - 4.0 qts./100 gal.

Mineral-Miner 21-0-0

A reacted stabilized, high-efficiency nitrogen formulated with complex carbohydrates and nutrient efficiency polymers, designed to stabilize nitrogen against volatilization loss while increasing plant availability of many soil solution macro and micro nutrients. Has synergistic impacts with residual fertilizers and soil nutrients due to its capability to solubilize and liberate nutrients bound to the soil colloid, making them plant available. Contains carboxylic acids to reduce bicarbonates and sodium. Hydrogen to reduce alkalinity. Carbon to optimize C:N ratios. Oxygen to enhance aerobic soil functions. Carbohydrates to support aerobic soil microbiology.

Rates:

Cool Season: 1.5 - 3.0 oz./1000 sq. ft.
Warm Season: 1.5 - 3.0 oz./1000 sq. ft.



Hydra-Gro 30-0-0

A scientifically formulated blend of quick release and slowly available nitrogen combined with proprietary forms of pigment for foliar uptake, improving general plant health and shoot growth. A very low salt index formulation optimizes root and foliar uptake. The liquid slow release nitrogen provides an even and consistent 6 to 8 week feed, avoiding issues associated with a surge of growth. Hydra-Gro fastens to the plant, where it is broken down and absorbed by stomatal openings.

Rates:

Cool Season: 3.0 - 15 oz./1000 sq. ft.

Warm Season: 3.0 - 15 oz./1000 sq. ft.

Hydra-Minors

The only comprehensive, multi-chelated micronutrient package containing plant available silica, SAR elicitors, and bio-stimulants. Hydra-Minors uses biostimulant technologies derived from desert plant extracts, which are designed to increase plant health and growth, even during times of stress. SAR (systemic acquired resistance) elicitors increase plant vigor and trigger plant defense responses. This highly synergistic combination reduces plant stress and enhances turf quality and color. Hydra-Minors contains 1.0% plant-available silica. This patented process to stabilize plant available silica hardens plant cells, resulting in tenaciously tough turf.

Rates:

Cool Season: 1.0 - 3.0 oz./1000 sq. ft.

Warm Season: 1.0 - 3.0 oz./1000 sq. ft.

Ornamental: 1.0 - 2.0 qts./100 gal.

Root Injection: 1.0 - 4.0 qts./100 gal.

Hydra-Kace 0-0-29

The highest foliar absorption potassium input on the market. Derived from potassium acetate (KA), Hydra-Kace ensures high tissue levels at low rates, reduced risk of foliar burn, and reduced fertilizer salt loading. It promotes carbohydrate synthesis and translocation, catalyzing numerous enzyme reactions including nitrate reduction, regulating transpiration, nutrient uptake, and respiration rates. Hydra-Kace influences turfgrass rooting, drought, heat and cold tolerance, while reducing the effects of turf stress.

Rates:

Cool Season: 1.5 - 3.0 oz./1000 sq. ft.

Warm Season: 1.5 - 3.0 oz./1000 sq. ft.

Ornamental: 2.0 - 4.0 qts./100 gal.

Hydra-Boost 3-10-15

The proprietary combination of phosphite (P03) and phosphate (P04) work together to enhance plant stress resistance while increasing plant energy and metabolism. Hydra-Boost is a catalyst for the plant's defense mechanism, resulting in robust turf, vigorously ready to defend against stress. Hydra-Boost is proven to be a great tool during aerification recovery, grow-in, over-seeding, or declining turf areas. University research has proven the combination of P03 and P04 create healthier, stronger roots.

Rates:

Cool Season: 1.5 - 3.0 oz./1000 sq. ft.

Warm Season: 1.5 - 3.0 oz./1000 sq. ft.

Ornamental: 0.5% solution v/v

Hydra-Phite 0-0-31

One of the purest liquids on the market, Hydra-Phite is a highly concentrated potassium phosphite reacted under strict temperature and quality control for enhanced compatibility and performance. Designed to mobilize in the plant, Hydra-Phite works rapidly to correct deficiencies, enhance plant and root development and improve resistance to environmental factors which favor disease development. Along with enhanced resistance to stress, Hydra-Phite is extremely systemic, rapidly transporting through phloem and xylem to areas of deficiencies or need.

Rates:

Cool Season: 2.5 - 3.5 oz./1000 sq. ft.

Warm Season: 2.5 - 3.5 oz./1000 sq. ft.

Ornamental: 0.5% solution v/v

Hydra-Phite 40 2-0-16

A more concentrated solution of phosphite designed to maximize the phosphorous acid delivery to the plant. Contains 5.84 pounds of phosphorous acid per gallon. Designed to improve plant strength and stress resistance, derived from phosphorous acid this formulation is extremely soluble and readily absorbed via the roots and foliar tissue. Studies have shown Hydra-Force enhances the activity of fungicides when jointly applied. In addition, the utilization of other nutrients when mixed and applied together as a supplement to a well balanced fertilizer program.

Rates:

Cool Season: 2.5 - 3.5 oz./1000 sq. ft.

Warm Season: 2.5 - 3.5 oz./1000 sq. ft.

Ornamental: 0.5% solution v/v

Hydra-Base 18-0-6

Low Salt Index. No Phosphates. No Nitrates. No Chlorides. A building block for protein, Hydra-Base 18-0-6 is a phosphate free foliar fertilizer. Potassium derived from potassium acetate (KA) for superior foliar uptake. Hydra-Base Nitrogen is broken down both chemically and biologically, which provides a lower use rate for higher quality results. Tank mix compatible with most pesticides.

Rates:

Cool Season: 3.0 - 8.0 oz./1000 sq. ft.

Warm Season: 3.0 - 8.0 oz./1000 sq. ft.

Ornamental: 1.0 - 4.0 qts./100 gal.

Root Injection: 1.0 - 4.0 qts./100 gal.

Hydra-Push 5-0-0

A comprehensive combination of nitrogen, calcium, carboxylic acids, fructose sugars and dual-mode surfactants. Hydra-Push penetrates water through hydrophobic soils, yet moving water latterly where needed. The blend of acids, calcium and proprietary polymers were built for: flushing bicarbonates and sodium off of the colloid, a tremendous surfactant for push-up greens, and its original purpose, a cost-effective nutrition and surfactant for fairway injection.

Rates:

Push-up Greens: 6.0 - 9.0 oz. / 1000

Injection on Fairways: 0.5 - 3.0 oz. / 1000

HYDRASMART SOIL & FOLIAR NUTRITION



Hydra-Balance 14-2-14

Hydra-Balance is a liquid fertilizer specifically designed for turf. Contains slowly available nitrogen as well as a highly foliar absorbable form of potassium: potassium acetate. 50% Triazone nitrogen provides a tremendous color response with a predictable growth curve. Low salt index. No nitrates. No chlorides.

Hydra-Carb 1-0-3

Hydra-Carb is a high brix molasses fertilizer with minors and plant proteins designed to stimulate native soil bacteria, enrich the soil and reduce thatch. Hydra-Carb is a high carbon, high carbohydrate supplemental fertilizer. Designed to fuel the food web within the root zone, Hydra-Carb provides a high-energy food source for rhizosphere bacteria. This dramatic stimulation of biological activity has a direct positive impact on root length, root mass, and turfgrass quality.

Hydra-Enrich20

Hydra-Enrich20 is a natural soil conditioner, organic chelator, and microbial stimulator that provides tremendous benefit to your soils and plants. A premium source of humic and fulvic acids derived from freshwater leonardite ore. Hydra-Enrich20 can enhance soil fertility by increasing nutrient availability and improving soil cation exchange. Especially useful on sand-based soils, where humic acid has been demonstrated to have positive effects on nutrient uptake and plant growth. Enhances photosynthesis, root development and nutrient uptake. Provides an oxidized carbon source. Sequesters water, enabling better penetration into the soil. Chelates soil micros, increasing availability to the plant. Increases CEC, improves low organic. Reduces long-term soil compaction soils.

Hydra-Carb 1-0-3

Hydra-Carb is a high brix molasses fertilizer with minors and plant proteins designed to stimulate native soil bacteria, enrich the soil and reduce thatch. Use Hydra-Carb on a regular basis to encourage healthy soil microbial populations, especially in sand based, low organic matter greens. Hydra-Carb is a high carbon, high carbohydrate supplemental fertilizer. Designed to fuel the food web within the root zone, Hydra-Carb provides a high-energy food source for rhizosphere bacteria. This dramatic stimulation of biological activity has a direct positive impact on root length, root mass, and turfgrass quality. Hydra-Carb also contains a broad complement of plant proteins, trace micronutrients, vitamins, minerals, amino acids, and other beneficial substances. Applications can result in up to a 75% increase in bacteriological activity.

Yield Starter 3-17-17

The lowest use rate phosphorous available. This immediately available eco-friendly orthophosphate immediately kick-starts the germination process of new seedlings. Then the addition phosphorous liberating bacterial inoculants unlocks phosphate and micronutrients tied up in the soil. University research has demonstrated faster, more vigorous, and more consistent growth on a variety of plants.

Liberate

This high active ingredient biostimulant contains biochemical microbes, which puts the germination and growth of new plants into overdrive. The premium sources of humic and fulvic acids condition the soil, acting as organic liberators and microbial stimulators. With the addition of the nutrient liberating microbes, Liberate facilitates growth of roots in the soil, mineralizes organic compounds, making them plant available, converts N into biological usable forms, and solubilizes P, leading to its release and availability.

Foundation 8-13-5

Scientifically formulated to accelerate vegetation and root growth. Powered by Nexus Technologies, Foundation contains 3 sources of nitrogen, 2 sources of phosphorous, phosphorous acid, proprietary plant extract hormones, and select micronutrients. These chemistries are synergistically built for two reasons: establish quick germination and long-lasting vegetation. Foundation significantly increases nutrient use, drives roots, growth hormones accelerate germination, micros assist in early stages of growth.

Hydra-Green 25-0-0

A scientifically formulated blend of quick release, slowly available nitrogen, iron, manganese and magnesium combined with proprietary forms of pigment for foliar uptake, improving general plant health and shoot growth. A very low salt index formulation optimizes root and foliar uptake. Enhanced with Ascophyllum Nodosum Kelp extracts to enhance turfgrass quality; a pure biostimulant that ensures turf has the antioxidants it needs to prepare for summer stress conditions. It boosts the defense system by creating carbohydrate reserves for the turf and infusing high levels of naturally beneficial cytokinins.



Cal-Vantage

A breakthrough in calcium formulations. A Fivefold Matrix of plant food co-factors is included in this recipe, namely: Calcium, Carbon, Nitrogen, Sulfur, and Boron.

When these ingredients are used synergistically as they are in Cal-Vantage, plant nutrition is addressed as it was meant to be. Unlike singular calcium products, chelated or not, Cal-Vantage provides ingredients that are associated with the uptake of plant foods. The result is a very bioactive and available form of calcium, in combination with an ample amount of plant available boron.

Rates: Turf Maintenance 2 - 4 oz./1000 sq. ft. weekly.

For Sodium removal or serious Calcium deficiencies increase the rate to as high as 8 - 10 oz./1000 sq. ft. Always try to mix the product into 2 - 3 gal. of water/1000 sq. ft.

Ornamentals: 4 - 6 oz./2 gal.

Sea 3

A unique liquid organic fertilizer formulated from three distinctive sea based nutrient sources: fish meal, kelp meal and sea water extracts. It is designed to feed the plant with nutrients that are stabilized with a host of carbon sources that allow the nutrients to stay in soil solution longer and allow the plant to take them up more completely. Carbon is the food stuff for microorganisms in the root zone that provides them the energy to freely multiply. As these microbes multiply, they release nutrients tied up in the soil. Sea 3™ provides layers of carbon from sources like kelp meal, fish meal, humic acids, and worm compost extracts.

Rate: One gallon per acre monthly

Trilogy Total Bio-Stimulant

Unique blend provides a base line program for plant, root and microbial stimulation. It supports strong plant growth and recovery, with a host of macro and micro nutrients; root stimulation with a concentration of humic and fulvic acids, and promotes a healthy and active microbial population with multiple forms of carbon. Over thirty raw materials to help build a stronger plant that will survive the rigorous pressures of today's turf and ornamental plant environments.

Rates & Programs: Greens & Tees - 4 - 6 oz./1000 sq. ft. every two weeks. Fairways & Sports Turf - 2 - 3 gals./A per month. Ornamentals - 8 oz./2 gals. as a drench. .

Kick – Soil Conditioner

Kick is the Ultimate Soil Conditioner. Designed to help open tight soils and stimulate microbial activity, Kick will promote healthy root growth in both turf and ornamentals, reduce plant stress, break nutrient bonds in the soil and is an available food source for microbial populations. With over twenty raw materials, Kick is one of the most complete soil conditioners available. Use Kick as part of a regular liquid application program for very tight soils, sodium rich soils, or to help stimulate new plantings

Rates & Programs: New Seeding: 6 oz./1000 sq. ft. at seeding and monthly after establishment. Maintenance: 2 - 4 oz./1000 sq. ft. in 2 gal. of water every 6 - 8 weeks throughout the growing season.

Mag Vantage

Carbon based magnesium complex designed to help build chlorophyll development in the plant to improve color and vigor. It is formulated using multiple forms of magnesium to maximize uptake in all kinds of soil and environmental conditions. Carbon ingredients improve nutrient uptake and soil conditions. Mag Vantage can help any plant in any environment be stronger and recover more quickly while improving color and vigor.

Rates: Greens & Tees: 5 oz / 1000 sq ft every 2 weeks.

Sports Fields: 1.5 gallons / acre once per month or as needed.

Ornamentals: 4 oz / 2 gallons of water drenched into root zone.

Protein Plus (14-2-5 + trace elements)

Combines six forms of nitrogen for maximum efficiency along with an entire spectrum of essential macro and micro nutrients and other important co-factors that are essential in the construction of a complete protein within the plant. Protein Plus uses over 60 trace elements, vitamins, minerals, carbon sources and other cofactors to help the plant quickly and efficiently build chlorophyll before pathogens have the opportunity to consume the free nitrogen and proliferate. 8 oz./1000 sq. ft. provides 1/10 lb. of N.

Rate: 6 oz./1000 sq. ft. For sports turf use 6-8 oz in 2 gallons of water every one or two weeks.

Potent Sea Plus

One of the most powerful microbial and plant bio-stimulants available. Formulated using fish meal, kelp extract and a humic acid blend, Potent-Sea Plus was recently reformulated incorporating higher quality raw materials and additional biologicals to improve its ability to promote microbial activity.

The combination of fish and kelp extract is a complete food source for microbes, but can also help reduce heat stress and add needed enzymes and amino acids to the soil plant complex.

Rate: New Seeding: 4 - 6 oz./1000 sq. ft. at germination repeat in 3 weeks; Maintenance: 2 - 4 oz./1000 sq. ft. every 2 - 6 weeks. Stressed Turf: 4 - 6 oz. /1000 sq. ft.

Mikronite

A carbon based foliar trace nutrient package designed to help reduce plant stress and build a level of immunity against disease and insect pressure. Trace elements are typically very immobile in most turf environments. Mikronite, with its carbon base, not only provides a host of needed trace elements but the carbon allows for maximum uptake. Trace elements act as the "spark plugs" that fire the engine of enzyme production needed for photosynthesis, protein production and synthesis and translocation of carbohydrates.

BioVantage

Active Ingredients include: Bacillus amyloliquefaciens, Bacillus licheniformis, Bacillus megaterium, Bacillus methylotrophicus and Bacillus subtilis. Combines biological inoculants with a liquid organic fertilizer formulated with three distinctive nutrient sources: fish, kelp meal and seawater extracts. They're designed to enhance the potency of the Rhizobacteria package. The Rhizobacteria produce metabolites that regulate both microbial and plant processes. These polymicrobial PGPR's are extremely stable, extending BioVantage's performance and shelf life.

Rate: 1 gallon per acre monthly

WATER SOLUBLE FERTILITY



Pennamin	Analysis	Rate / Acre	Rate / 1000 sq. ft.	Timing
Driver-P	12-0-0	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
High K	6-0-15 + 9 % C a	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Perfect	5% Ca, 2% Mg, 0.025% B & Cu, 0.125% Zn, 0.008% Fe, 0.06% Mn	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
C a + Mg	8 - 0 - 0 8 % + C a + 8 % Mg	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Fe + Mn	9-0-0 + 4% Fe + 3% Mn	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Ca	7-0-0 + 1 4% C a	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Cu	11-0-0 + 8 % C u	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Fe	9-0-0 + 6% Fe	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Mg	1 0 - 0 - 0 + 1 2 % Mg	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Mn	1 0 - 0 - 0 + 7 % Mn	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Si	10-0-0 + 4% Si	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days
Zn	11-0-0 + 9% Zn	1 - 5 lbs.	0.4 - 2.0 oz.	Apply every 14-28 days

100% of the amino acids in Pennamin products are free amino acids, meaning nitrogen becomes plant available very quickly. Pennamin amino acids are in L-Form. Only L-Form amino acids are suitable for plant uptake and utility. The amino acids promote microbial life in the soil. . Pennamin has a 6:1 carbon to nitrogen (C:N) ratio, meaning nitrogen becomes plant available shortly after application and is slowly released for two (2) weeks.

Product	UOM	Description	Sq. Ft. / Bag	Nutrient lbs. / 1000 Sq. Ft.		
				N	P	K
28-8-18 Bent Plus	25 lb.	Produced specially for the nutritional needs of bentgrass. The nutrition package helps bentgrass tolerate heavy traffic and frequent mowing. Contains a balanced mixture of all essential plant nutrients to deliver consistent plant health and performance.	40,000	0.15	0.03	0.11
20-20-20 Multi-Purpose	25 lb.	For use on turf and landscape and a wide variety of field and vegetable crops. Three different forms of nitrogen giving plant multi-purpose feeding.	20,000	0.25	0.25	0.25
9-45-15 Starter	25 lb.	Ideal for hydroseeding, overseeding and new sod installations. Provides extra water soluble phosphorous to help stimulate root development.	22,500	0.10	0.50	0.165



Rx C85 FLOW

A reacted plant nutrient high in soluble carbon that increases soil microbial activity due to short, medium, and long chain carbon content. Application of C-85 results in increased beneficial soil microbial activity and dramatic improvements in fertilizer efficiency. 85% Carbon, Fulvic, Humic and Humin Acid.

Rates: 32 ounces per acre.

Rx PeneCal

A reacted plant nutrient product high in surfactant and calcium. PeneCal reduces water surface tension and delivers calcium to the root zone. 10% Ionic Ca, 22% ethoxylated co-polymers.

Rate: 0.25 to 1.0 gallon per acre.

Rx K+ Micro Crystal

A reacted nutrient high in potassium and phosphate unique in its ability to promote phenolic compound production. Use K+ to reduce oxidative stress and to increase turf quality. 0-31-50.

Rate: 2.0 – 4.0 pounds per acre

Rx Si

A reacted plant nutrient high in calcium and silicon, which strengthens cell walls and reduces oxidative stress. 10% Ca, derived from Calcium Silicate

Rate: 0.5 to 1.0 gallon per acre

Rx P+

A reacted plant nutrient high in phosphorus that resists tie up and stimulates root growth. 2-15-2, 8% aminos, 3% Humic

Rate: 0.5 to 1.0 gallon per acre.

Rx Micro

A six nutrient combination fertilizer. It is complexed and chelated for efficient uptake whether applied to the plant foliage or soil. It offers optimum efficiency for the budget dollar. Chlorophyll package, Fe, Zn, Mn, Cu, B, 2% Humic, 3% Aminos

Rate: 0.25 to 0.5 gallon per acre

Rx Fairway +

1-7-12 with 2% Humic Acid. A phosphorous and potassium fertilizer, containing proprietary soluble carbon compounds. TurfRx Fairway + reduces abiotic stress, improves root development and increases soil microbial diversity due to humic, fulvic, and long-chain soluble carbon content. TurfRx Fairway + utilizes technology from its proprietary TrufRx formulations of P+, K+, and C-85.

Rate: 1 gallon per acre

Rx Ca

Rx Calcium is specifically formulated to provide concentrated plant-available calcium for plant nutrition and soil structure. Redox microencapsulation allows for improved calcium uptake and movement within the plant, in addition prevents calcium tie-up in the soil allowing for improved soil structure. Derived from Calcium Carbonate.

Rate: 0.5 – 1 gallon per acre

Rx NatureCur

Rx NatureCur is a botanical extract product that contains 5% potassium. Contains proprietary soluble carbon compounds that improve antioxidant production and stimulate root growth and metabolism. Reduces abiotic stress by increasing root quality and quantity, resulting in improved soil health. Derived from Potassium Hydroxide.

Rate: 0.5 – 1 gallon per acre

Rx Green

1-5-5 B, Cu, Fe, Mn, Mo, Zn. A complete multi-nutritional fertilizer specifically formulated to improve metabolic activity and nutritional balance on golf greens. Formulated with proprietary carbon compounds, TurfRx Green will reduce mowing height stress, improve plant vigor, and increase overall playing surface performance and color.

Rate: 0.5 to 1.0 gallon per acre.

Rx OxyCal

Rx OxyCal is a reacted nutrient product containing calcium, potassium, phosphate, oxygen, and proprietary carbon compounds. It stimulates a broad range of antioxidant compounds.

Rate: 5.0 – 1 gallon per acre

Rx Supreme

0-5-4 B, Cu, Fe, Mn, Mo, Zn. Specifically formulated to target plant sugar alcohol production related to nitrogen metabolism in plants. The combination of plant nutrients and increased sugar alcohols will enhance nitrogen metabolism and improve overall quality and performance.

Rate: 0.5 to 1.0 gallon per acre.



SLOW RELEASE SOURCES OF NITROGEN & POTASSIUM

Triazone

Triazone

Triazone Urea, used specifically in HydraSmart solutions is a low salt index, polymerbased nitrogen source that provides rapid, yet sustained feeding through both root and leaf tissue. The net result is a more consistent and lasting color response without stimulating excess canopy growth and without introducing unnecessary plant stress from excess fertilizer salt.



Meth-Ex 40

Meth-Ex® 40 is a high activity methylene urea nitrogen source that provides extended turf feeding without the need for coatings. Microbial release allows Meth-Ex® 40 to release nitrogen when the turf needs it the most. The result is a quick color response with no surge growth and a consistent and reliable long-term feeding schedule.



MESA

MESA® is a unique nitrogen source that combines ammonium sulfate with methylene urea in a single, homogeneous particle. The result is an extremely effective and controlled nitrogen source that produces consistent, dark green color without excessive growth. Unlike coated nitrogen technologies, MESA® does not lose its slow-release properties when cracked, chipped, crushed or broken.



Expo

Expo® is LebanonTurf's patented, single-particle, extended release potassium sulfate technology. Expo® granular (SGN 195) is designed to deliver potassium to the turf in a reliable and predictable rate over a longer period of time, well beyond that of the standard potassium sulfate found in most fertilizers. Additionally, both Expo® granular and mid-sized (SGN 145) delivers controlled release nitrogen.



Duration

Controlled-release fertilizer relies on a patented and durable polymer-coated technology to gradually and efficiently release nutrients. Consistent metering of nutrition that lasts for weeks, even months, with fewer applications. This consistency helps to take the worry out of maintaining healthy turfgrass and plants for turfgrass managers, lawn and landscape professionals and specialty ag growers. Available in both Nitrogen and potassium forms.



XCU

Slow-release fertilizer provides gradual, steady nutritional uptake for up to 10 weeks of plant response. XCU® fertilizer has the highest nitrogen (N) content (43%) and lowest sulfur content (4%) of any polymer-coated sulfur-coated urea (PCSCU) on the market. The value is more area can be covered per application using less fertilizer, which is more efficient and economical.



Nitroform

Slow-release urea-formaldehyde (UF) fertilizer delivers a steady, balanced and dependable source of nitrogen (N) for up to 22 weeks or more. Professionals have relied on NITROFORM® fertilize due to its exclusive release properties that make it one of the safest and longest-lasting slow-release sources of N available.



UMAXX

Stabilized nitrogen (N) fertilizer provides protection against all three forms of nitrogen (N) loss - leaching, denitrification and volatilization. It is a urea-based product with a 46-0-0 analysis, containing both urease and nitrification inhibitors. A completely soluble granular, UMAXX® fertilizer is equally effective whether spread dry or dissolved in a spray mix.



UFLEXX

Stabilized nitrogen fertilizer is specially formulated for the professional lawn care and landscape markets. This unique product helps to protect against all three forms of loss - leaching, denitrification and volatilization - allowing time for nitrogen (N) to move into the root zone and stay there longer. As a result, there is immediate green-up, followed by sustained turfgrass color for up to 8 weeks.

STARTER FERTILIZER



Myco-Replenish 3-3-3 w/ Mycorrhizae

Combines the high quality of EarthWorks Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. Myco-Replenish is ideal for any landscape planting situation, establishment of grass seed or sod and will enhance all soil aeration practices. An extensive amount of Mycorrhizae fungi in combination with the known value of the Replenish compost fertilizer will help to promote extensive root growth, reduce heat and drought stress, improves water and nutrient uptake and can eliminate transplant shock.

Guaranteed Analysis:

2.10% Water Insoluble Nitrogen	3.00% Soluble Potash (K2O)
0.90% Other Water Soluble Nitrogen	6.00% Calcium
3.00% Available Phosphate (P2O5)	0.20% Iron

Liberate

This high active ingredient biostimulant contains biochemical microbes, which puts the germination and growth of new plants into overdrive. The premium sources of humic and fulvic acids condition the soil, acting as organic liberators and microbial stimulators. With the addition of the nutrient liberating microbes, Liberate facilitates growth of roots in the soil, mineralizes organic compounds, making them plant available, converts N into biological usable forms, and solubilizes P, leading to its release and availability.

organicPLUS 10-20-10

A great starter fertilizer that offers turf managers a more environmental approach to their program. A great answer to not only the science of agronomics, yet also the science of the environment. Blended with Ocean Gro organics, 10-20-10 contains a minimum of 50% organics, micronutrients and XCU slow release technology. Meaning, less applications with great turf response. Feeds up to 12 weeks, which is essential during seed germination and establishment. organicPLUS also provides a stress relief formula for better disease tolerance during challenging summer months.

Bulldog 9-45-15

Ideal for hydroseeding, overseeding, and new sod installations. Provides extra water soluble phosphorous to help stimulate root development. Excellent whenever soil tests indicate the need for extra phosphate. Nitrogen efficiency; controls loss to volatilization, denitrification and leaching

Guaranteed Analysis:

7.00% Ammoniacal Nitrogen	15% Soluble Potash
2.00% Nitrate Nitrogen	1.2% S; .01% B; .01% Cu; .20% Fe
45% Available Phosphate (P2O5)	.06% Mn; .01% Mo; .01% Zn

Green Alliance 13-25-10

Green Alliance 13-25-10 provides a consistent nitrogen feed, allowing the plant to develop a strong root system and predictable color. Contains NutriLife technology. NutriLife® is a biochemical fertilizer catalyst that makes fertility programs more efficient by getting more nutrients into the plant and improving plant performance. NutriLife improves the conversion of organic and inorganic fertilizers into plant-available forms.

Replenish 5-4-5

The most complete plant and soil food on the market today and is the 'flagship' of the EarthWorks product portfolio. Formulated Natural Organic fertilizer that can be used for any plant or ornamental application without fear of burn or salt build up. Replenish products feed the plant and soil. The rich carbohydrates provide a quick burst of energy to beneficial bacteria, the humic acid complex provides a sustainable food source for long-term biological activity, and the minerals replenish the soil with the nutrients.

Foundation 8-13-5

Scientifically formulated to accelerate vegetation and root growth. Powered by Nexus Technologies, Foundation contains 3 sources of nitrogen, 2 sources of phosphorous, phosphorous acid, proprietary plant extract hormones, and select micronutrients. These chemistries are synergistically built for two reasons: establish quick germination and long-lasting vegetation. Foundation significantly increases nutrient use, drives roots, growth hormones accelerate germination, micros assist in early stages of growth.

Hydra-G Starter 8-14-4

Scientifically formulated to accelerate vegetation and root growth. Powered by Nexus Technologies, Foundation contains 3 sources of nitrogen, 2 sources of phosphorous, phosphorous acid, proprietary plant extract hormones, and select micronutrients. These chemistries are synergistically built for two reasons: establish quick germination and long-lasting vegetation. Foundation significantly increases nutrient use, drives roots, growth hormones accelerate germination, micros assist in early stages of growth.

NutriSCAPE 14-20-14

Provides a consistent nitrogen feed, allowing the plant to develop great color, without a lot of top growth. XCU® slow-release fertilizer provides gradual, steady nutritional uptake for up to 10 weeks of plant response. XCU® fertilizer has the highest nitrogen (N) content (43%) and lowest sulfur content (4%) of any polymer-coated sulfur-coated urea (PCSCU) on the market. Less sulfur coating reduces N lock-off and delivers more nitrogen.

21-22-4 with Tenacity

A homogeneous starter fertilizer granule impregnated with 0.08 percent Mesotrione herbicide. Unlike most herbicides, this distinctive product is ideal for use during turf establishment (bare ground seeding, sodding, sprigging or plugging), renovation or overseeding. ProScape Starter Fertilizer with Mesotrione can be used for pre-emergence control of 33 listed broadleaf and grassy weeds. This product is packaged in a 40 lb. poly bag with a typical use rate of 187 lbs./acre.

Yield Starter 3-17-17

The lowest use rate phosphorous available. This immediately available eco-friendly orthophosphate immediately kick-starts the germination process of new seedlings. Then the addition phosphorous liberating bacterial inoculants unlocks phosphate and micronutrients tied up in the soil. University research has demonstrated faster, more vigorous, and more consistent growth on a variety of plants.

ORGANIC GRANULAR FERTILITY



Replenish 5-4-5

The most complete plant and soil food on the market today and is the 'flagship' of the EarthWorks product portfolio. Formulated Natural Organic fertilizer that can be used for any turf or ornamental application without fear of burn or salt build up. Replenish products feed the plant and soil. The rich carbohydrates provide a quick burst of energy to beneficial bacteria, the humic acid complex provides a sustainable food source for long-term biological activity, and the minerals replenish the soil with the nutrients.

Guaranteed Analysis:

1.30% Ammoniacal Nitrogen
1.00% Other Water Soluble Nitrogen
2.70% Water Insoluble Nitrogen
4.00% Available Phosphate (P205)
5.00% Soluble Potash (K2O)
6.00% Calcium

Replenish 8-2-2

A cost effective blend of ammonia sulfate and the Replenish compost. Designed to be used on fairways, roughs, lawn care and sports fields. Replenish compost is superior to sludge based organics, because it is a rich egg layer compost that has not been pasteurized. It is very biologically active and will provide your turf with a mineral and nutrient rich fertilizer that will produce a rich deep color with long lasting results. The ammonium sulfate provides a quick green-up and can help release tied up calcium and lower soil pH.

Guaranteed Analysis:

6.30% Ammoniacal Nitrogen
1.50% Other Water Soluble Nitrogen
0.20% Water Insoluble Nitrogen
2.00% Available Phosphate (P205)
2.00% Soluble Potash (K2O)
6.00% Calcium

Replenish 3-4-3

OMRI certified 3-4-3 is 100% egg layered poultry compost. A very effective form of top dressing fertilizer and an important part of many soil programs. The compost used in this product is all egg layer waste, which is very high in calcium, carbon and naturally occurring minerals. 3- 4-3 has gone through two separate digestion cycles, one in the bird and one in the composting facility. The dual process allows all the minerals not used by the bird to become a part of the fertilizer, adding more microbial richness.

Guaranteed Analysis:

0.70% Other Water Soluble Nitrogen
2.30% Water Insoluble Nitrogen
4.00% Available Phosphate (P205)
3.00% Soluble Potash (K2O)
9.00% Calcium (Minimum)

Replenish 10-2-5

An ammonium sulfate Formulated Natural Organic Fertilizer. This product is a combination of soluble ammonium sulfate nitrogen and rich biologically active Replenish fertilizer. Ammonium sulfate is ideal for spring and fall applications to help warm up cool soils and release tied up calcium while providing a soluble form of nitrogen. When blended with the EarthWorks Replenish compost and rock minerals, a powerful fertilizer is created that feeds both the soil and the plant.

Guaranteed Analysis:

4.20% Ammoniacal Nitrogen
1.25% Other Water Soluble Nitrogen
4.55% Water Insoluble Nitrogen
2.00% Available Phosphate (P205)
5.00% Soluble Potash (K2O)
7.00% Calcium

Myco-Replenish 3-3-3 w /Mycorrhizae

Combines the high quality of EarthWorks Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. Myco-Replenish is ideal for any landscape planting situation, establishment of grass seed or sod and will enhance all soil aeration practices. An extensive amount of Mycorrhizae fungi in combination with the known value of the Replenish compost fertilizer will help to promote extensive root growth, reduce heat and drought stress, improves water and nutrient uptake and can eliminate transplant shock.

Guaranteed Analysis:

2.10% Water Insoluble Nitrogen
0.90% Other Water Soluble Nitrogen
3.00% Available Phosphate (P205)
3.00% Soluble Potash (K2O)
6.00% Calcium
0.20% Iron

Replenish 16-1-5

A low phosphorous slow release nitrogen carbon based fertilizer providing the proven soil building value Replenish products are known for. Formulated with high quality methylene urea for long lasting color and growth, ammonium sulfate for a quick response and Replenish compost to build soils and balance carbon levels. The phosphate in the 16-1-5 is coming exclusively from carbon based organic composts.

Guaranteed Analysis:

1.80% Ammoniacal Nitrogen
9.60% Other Water Soluble Nitrogen
4.60% Water Insoluble Nitrogen
1.00% Available Phosphate (P205)
5.00% Soluble Potash (K2O)
4.40% Calcium

ORGANIC GRANULAR FERTILITY



Hydra-G Calcitic

Hydra-G Calcitic is a unique formulation of soluble Calcium complexed with a powerful blend of beneficial active microbes. Hydra-G Calcitic supplies essential soluble Calcium to the soil for pH adjustment. By ensuring proper pH levels, Hydra-G Calcitic helps make stored and applied nutrients more available to the plant and soil. The unique blend of microbes stimulate the beneficial microbes in the soil to promote nutrient efficiency, which helps release nutrients that are already in the soil. With enhanced nutrient release, plants are more resilient to tolerate environmental stressors like heat, cold, drought and foot traffic.

organicPLUS 16-3-8

A low phosphorous slow release nitrogen natural base organic fertilizer, containing 4 different forms of nitrogen for soil building nutrients. The ammonium sulfate and urea provide a quick shot of color and growth, while the XCU and organics provide a continuous feed to the soil. Loaded with a full micro-nutrient package, 16-3-8 gives the essential elements needed to provide healthy plants. 16-3-8 product has been developed for both cool season and warm season applications and also ornamentals. OceanGro organics is considered by the EPA as an "Exceptional Quality Class-A" granular organic fertilizer. Before the meticulous blending process starts, organicPLUS is derived from a 5-5-0 fertilizer, has a neutral pH with a consistent reading of 7.0.

organicPLUS 15-3-0

A cost effective blend of urea and OceanGro organics, specifically designed for use on fairways, roughs, lawn care and sports fields. 15-3-0 is another economical tool with the agronomic benefits to provide a turf and soil nutrient feed. OceanGro organics helps breakdown microbes in the soil giving a boost of energy to the plant. 15-3-0 is a great product for late spring or early fall to create the wow factor for your customers. The soluble calcium provides a nice color response while the 25% XCU nitrogen feeds for a minimum of 12 weeks. organicsPLUS also provides a stress relief formula for better disease tolerance during challenging summer months.

organicPLUS 10-20-10

A great starter fertilizer that offers turf managers a more environmental approach to their program. A great answer to not only the science of agronomics, yet also the science of the environment. Blended with Ocean Gro organics, 10-20-10 contains a minimum of 50% organics, micronutrients and XCU slow release technology. Meaning, less applications with great turf response. Feeds up to 12 weeks, which is essential during seed germination and establishment. organicsPLUS also provides a stress relief formula for better disease tolerance during challenging summer months.

Humic Plus with Hydra-G

Humic Plus with Hydra-G benefits soil and plants in multiple ways. This multi-active ingredient solution delivers beneficial active microbes to the soil. The humic acid provides an essential carbon source as food for the microbial activity. The immediately available soluble Calcium in Hydra-G goes to work to ensure proper soil pH, facilitating maximum uptake of stored and applied nutrients. Together, these powerful ingredients work to cultivate healthy growing conditions and maximize fertilizer efficiency. Increases turf vigor and seeding density by 30%. Compliments traditional fertilizer programs. 11% increase in soil water sequestration.

organicPLUS 25-2-5

Developed for economical fairway and lawn applications, 25-2-5 is blended with micro and macro nutrients to provide quick and long-lasting color response. 25-2-5 is a great spring or fall fertilizer for cool season and a tremendously powerful summer application for warm season. Turf professionals can receive over 1 lb. of Nitrogen at one of the most cost-effective ways in the market. Yet, still receiving the benefits of high calcium, microbial activity, soil strength, and three sources of nitrogen to feed both the soil and the plant. 25-2-5 contains 25% XCU nitrogen. A patented coated urea that extends the nutrient uptake for 12 weeks. 25-2-5 contains 40% OceanGro natural base organics.

organicPLUS 12-3-12

12-3-12 contains 50% slow release derived from Ocean Grow Organics and XCU coated nitrogen. 12-3-12 provides a great benefit to soil structure and composition and is blended with micro and macro nutrients to provide quick and long-lasting color response. 12-3-12 is a great fall fertilizer for warm season bermudagrass, helping put "the bermuda to bed." 12-3-12 is a tremendously useful all purpose ornamental solution. The benefit of 3 sources of nitrogen; XCU OceanGrow Organics and urea provide a multi-purpose feed lasting up to 14 weeks. In addition the intangible benefits of microbial activity and breakdown leaves less peaks and valleys in growth and color.

organicPLUS 10-6-4

10-6-4 is considered the all purpose solution the organicPLUS portfolio. Providing a great balance of soil amendment plus a balance of fertility 10-6-4 gives the plant longer and stronger root structure plus color response. Great solution for landscape ornamentals, new seeding, aerification, or season long maintenance. OceanGrow™ organics serves as a feeding source for microbial activity in the soil. Microbes can only break down a specific amount of OceanGrow™ organics at one time, leaving less peaks and valleys in turf growth and color. 10-6-4 contains 30% XCU nitrogen plus 60% oceanGro organics.

SYNTHETIC FERTILITY



Type	Product	SGN	Nutrient Component	Coverage	lbs. / 1000	Bags / Acre	lbs. / Acre	lbs. N / 1000	lbs. P / 1000	lbs. K / 1000
Single Nutrient Fertilizer	46-0-0 Uflexx	150	Stabilized Nitrogen; Urease inhibitor - NBPT	23,500	2.17	1.89	95	1.00	0.00	0.00
	47-0-0 Umaxx	150	Stabilized Nitrogen Urease inhibitor - NBPT	23,500	2.12	1.85	93	1.00	0.00	0.00
	30-0-0 Mesa	200	Methex-40 + Ammonium Sulfate	15,000	3.00	2.9	145	1.00	0.00	0.00
	40-0-0 Meth-Ex 40	195	Composite Meth-Ex 40	20,000	2.5	2.18	109	1.00	0.00	0.00
	46-0-0 Sprayable	90	Urea	23,000	2.17	1.89	95	1.00	0.00	0.00
	21-0-0 Ammonium Sulfate	90	Ammonium Sulfate	10,000	5	4.14	207	1.00	0.00	0.00
	46-0-0 Granular	200	Urea	23,000	2.17	1.89	95	1.00	0.00	0.00
	0-46-0	240	Triple Super Phosphate	22,700	2.20	2.00	95	0.00	1.00	0.00
	43-0-0 Duration (45, 90, 120, 180)	150 200	Durable Polymer Coating	21,500	2.32	2.02	101	1.00	0.00	0.00
	0-0-50 Duration (180 Day)	90	Durable Polymer Coating	25,000	2.00	1.75	87	0.00	0.00	1.00
	0-0-50 SOP	90 150 220	Sulfate of Potash	25,000	2.00	1.75	87	0.00	0.00	1.00

Type	Product	SGN	Nutrient Component	Coverage	lbs. / 1000	Bags / Acre	lbs. / Acre	lbs. N / 1000	lbs. P / 1000	lbs. K / 1000
NutriSCAPE Nutritionals	Hydra-G 8-14-4	200	Urea + 20% Ca + Humic, Fulvic and Carboxylic Acid + Kelp	10,000	5.00	4.36	218	0.40	0.70	0.20
	Hydra-G 12-0-4	200	Urea + 30% XCU + 23% Ca + PHCA Humic Acid	6,000	8.25	7.26	359	0.99	0.00	0.33
	25-0-15	200 150	Urea + 30% CRN + 2% Fe	13,000	4.00	3.48	174	1.00	0.00	0.60
	32-0-7	200 150	Urea + 50% CRN	16,000	3.13	2.72	136	1.00	0.00	0.22
	16-0-8	200	Urea + 32% CRN + Fe & Mn	11,000	4.69	4.08	204	0.75	0.00	0.38
	14-20-14	200	Urea + 30% CRN	10,000	5.00	4.36	218	0.70	1.00	0.70
	5-0-30 SOP	200 150	Urea + SOP +10% Fe	17,000	3.00	2.61	131	0.15	0.00	0.75
	44-0-0	200 150	Urea + 50% SRN	22,000	2.27	1.98	99	1.00	0.00	0.00
	19-0-5	200	35% Nutralene	11,000	4.65	4	200	0.86	0.00	0.27
	24-0-6	200	25% Nutralene	12,500	4	3.5	175	0.95	0.00	0.24
	30-0-6	200	50% PCU	15,000	3.4	3	150	1	0.00	0.2
	30-0-8	200	All Mineral	15,000	3.4	3	150	1	0.00	0.27

FERTILITY WITH CONTROL PRODUCTS

Type	Product	UOM	SGN	Nutrient Component	Coverage	lbs. / 1000	Bags / Acre	lbs. / Acre	lbs. N / 1000	lbs. P / 1000	lbs. K / 1000
Pre-Emergent Fertilizer	.172% Dimension 15-0-2	50 lb.	200	Urea + 25% XCU	15,000	3.34	2.90	145	0.50	0.00	0.07
	.13% Dimension 19-0-5	50 lb.	200	Urea + 25% XCU	11,000	4.41	3.85	192	0.84	0.00	0.22
	.172% Dimension 5-0-15	50 lb.	200	Urea + SOP	15,000	3.34	2.9	145	0.17	0.00	0.50
	.13% Dimension 10-0-3	50 lb.	200	100% XRT	11,000	4.65	4.00	200	0.45	0.00	0.14
	.17% Dimension 5-0-20	50 lb.	200	Urea +SOP	15,000	3.4	3.00	150	0.17	0.00	0.68
	Meas .13% Dimension 22-0-6	50 lb.	200	40% XRT	11,000	4.65	4.00	200	1.00	0.00	0.27
	.37% Prodiamine 5-0-15	50 lb.	200	Urea + SOP	11,000	4.65	4.00	200	0.23	0.00	0.69
	.37% Prodiamine 14-0-2	50 lb.	200	Urea + 25% XCU	11,000	4.65	4.00	200	0.65	0.00	0.09
	.58% Prodiamine 15-0-0	50 lb.	200	Urea	17,000	2.96	2.6	129	0.44	0.00	0.00
	.37% Prodiamine 0-0-7	50 lb.	200	MOP	11,000	4.65	4.00	200	0.00	0.00	0.33
	.38% Prodiamine 10-0-3	50 lb.	200	100% XRT	11,000	4.65	4.00	200	0.45	0.00	0.14
	1.50% Ronstar 5-0-15	50 lb.	200	Urea + MOP	11,000	4.59	4.00	200	0.23	0.00	0.69
	1.50% Ronstar 14-0-2	50 lb.	200	Urea	11,000	4.59	4.00	200	0.64	0.00	0.09
	3.74% Tupersan 12-24-11	50 lb.	190	Urea + P205 + MOP	10,000	2.50	2.18	109	0.30	0.60	0.28
Pre-Emergent Insecticide	One & Done 30-0-0 .167 Dimension, .067 Acelepryn	50 lb.	150	100% XRT	15,000	3.4	3.00	150	1	0	0
	One & Done 30-0-10 .167 Dimension, .067 Acelepryn	50 lb.	150	100% Surf 4 + SOP	15,000	3.4	3.00	150	1	0	0.34
	One & Done 30-0-6 .167 Dimension, .067 Acelepryn	50 lb.	230	100% Surf 4 + SOP	15,000	3.4	3.00	150	1.23	0	0.2
Weed & Feed	LockUp 15-0-5	50 lb.	200	Urea + 25% XCU	13,000	4.00	3.48	174	0.60	0.00	0.20
	Viper 0-0-7	50 lb.	200	MOP	13,000	4.00	3.48	174	0.00	0.00	0.28
	Dimension / Lockup 19-0-6	40 lb.	200	Urea + 40% Mesa	14,200	3.5	3.0 0	152	0.67	0.00	0.21
	Dimension / Confront 19-0-6	40 lb.	200	Urea + 33% Mesa	12,500	4.00	3.48	174	0.76	0.00	0.24
	Dimension / Trimec 19-0-6	40 lb.	200	Urea + 33% Mesa	14,200	3.5	3.00	152	0.67	0.00	0.21
Insects	.20% Merit 0-0-7	50 lb.	200	MOP	14,200	3.50	3.00	152	0.00	0.00	0.25
	0.20% Merit 15-0-5	50 lb.	200	Urea + 25% XCU	14,200	3.50	3.00	152	0.53	0.00	0.18
	0.069% Bifenthrin 0-0-7	50 lb.	200	MOP	8,000	6.00	5.22	261	0.00	0.00	0.42
	0.67% Acelepryn 0-0-7	50 lb.	200	MOP	9,500	5.25	4.56	228	0.00	0.00	0.37
	.67% Ace + .25% Dim 38-0-0	50 lb.	200	100% Meth-Ex 40	14,200	3.50	3.00	152	1.33	0.00	0.00
	.225% Allectus 0-0-7	50 lb.	220	SOP	12,500	4.00	3.5	174	0	0	0.28
	.20% Imidicloprid 25-0-5	50 lb.	200	Biosolids + 50% XRT	12,500	4.00	3.5	175	1	0	0.2
Granular Fungicide	Heritage G	40 lb.	Preventative or curative strobilurin fungicide perfect for lawn applications							1.2 to 4.6 lbs.	
	Headway G	40 lb.	Banner Maxx + Heritage on a dispersable granular prill. 28 day control.							2.0 to 4.0 lbs.	
	Pillar G	30 lb.	Insignia + Trinity on a convenient granular carrier. 28 day control.							3.0 lbs.	
	Bayleton G	30 lb.	Preventative systemic fungicide for turfgrass diseases. Contains 1% triademefon.							1.5 to 3.0 lbs.	
	Daconil G	20 lb.	Contact control of turfgrass diseases including dollar spot, red thread, anthracnose. Contains 5% Chlorothalonil							4.0 to 6.0 lbs.	
	Eagle G	25 lb.	0.62% myclobutanil. Perfect for broad spectrum applications. Cost effective.							2.5 to 5.0 lbs.	

FERTILITY WITH CONTROL PRODUCTS

Type	Product	UOM	Description	lbs. / 1000
Granular Pre-Emergent	Hydra-G + 0.37% Prodiamine	50 lb.	220 lbs. per acre provides a full maintenance rate of Solu-Cal (5 lbs. / 1000) + 0.80% Prodiamine AI per acre.	5.0 to 6.0 lbs.
	Hydra-G + 0.13% Dithiopyr	50 lb.	220 lbs. per acre provides a full maintenance rate of Solu-Cal (5 lbs. / 1000) + 0.29% Dithiopyr AI per acre.	5.0 to 8.8 lbs.
	Specticle G	50 lb.	Versatile pre-emergent herbicide with up to six months of broad-spectrum control against more than 90 broadleaf and grassy weeds, plus annual sedges.	2.3 to 4.6 lbs.
	Ronstar / Oxidiazon G	50 lb.	Pre-emergent used in and around landscape / nursery ornamental plants. Contains 2% oxidiazon on micronutrient carrier. Apply under mulch. Also contains turf label.	2.25 to 4.5 lbs.
	Andersons Goose & Crab	28.8 lb.	5.25% betasan and 1.31% ronstar, provides superior season long control of goose and crabgrass and other weeds in bentgrass.	2.6 lbs.
	Tupersan 4.6 G	50 lb.	Pre-emergent herbicide with season long control for crabgrass control during new seeding situations.	2.0 lbs.
	Pendulum 2T	40 lb.	Controls more than 40 grassy and broadleaf weeds - including troublesome weeds like oxalis, henbit and spurge. Application rates vary.	1.75 to 3.0 lbs.
	Freehand	50 lb.	Superior control on broadleaf weeds and grasses in and around landscape ornamental plants. Contains trifluralin and isoxaben. Apply under mulch.	3.4 to 4.6 lbs.
	Snapshot / TI 2.5 G	50 lb.	Superior control on broadleaf weeds and grasses in and around landscape ornamental plants. Contains trifluralin and isoxaben. Apply under mulch.	2.3 to 4.6 lbs.
Granular Insecticides	Acelepryn	25 lb.	Season-long grub control in April or May. Will control many key surface feeding pests including several species of caterpillars.	1.5 to 2.3 lbs.
	Merit / Imidacloprid .5 G	30 lb.	Preventative control for pests including white grubs, cutworms, chinch bugs and others. Contains 0.5% imidacloprid.	1.4 to 1.8 lbs.
	Talstar / Bifenthrin G	25 lb.	Broad spectrum control of pests including armyworm, cutworm, chinch bug, fleas, ticks and more. Contains 0.2% bifenthrin..	1.5 to 4.6 lbs.
	Dylox G	30 lb.	Quickest knockdown and curative control for white grubs, cutworms and sod webworms. Great fall clean-up solution.	2.0 to 3.0 lbs.
	Meridian 33 G	40 lb.	Long lasting - broad spectrum systemic control of turf and ornamental insects, including ants.	1.8 to 2.7 lbs.
	Arena G	40 lb.	Provides long lasting - wide spectrum systemic control of turf and ornamental pests. Contains Clothianidin.	1.8 to 2.7 lbs.



ORNAMENTAL FERTILITY



Humic Plus with Hydra-G

Humic Plus with Hydra-G benefits soil and plants in multiple ways. This multi-active ingredient solution delivers beneficial active microbes to the soil. The humic acid provides an essential carbon source as food for the microbial activity. The immediately available soluble Calcium in Hydra-G goes to work to ensure proper soil pH, facilitating maximum uptake of stored and applied nutrients. Together, these powerful ingredients work to cultivate healthy growing conditions and maximize fertilizer efficiency. Increases turf vigor and seeding density by 30%. Compliments traditional fertilizer programs. 11% increase in soil water sequestration.

Hydra-Cal

Hydra-Cal is a highly active 3-way blend of acetate, nitrate, and chelated forms of calcium. Hydra-Cal contains a unique bio-stimulant technology derived from desert plant extracts designed to increase plant health and root growth. The combination of highly efficient foliar uptake, root absorption, and chelated calcium maximizes calcium delivery to the leaf tissue as well as to the roots. The addition of boron and magnesium further enhances cell wall strengthening and chlorophyll production. Plant available silica enhances the physical strength and stress resistance of the plant.

Foundation 8-13-5

Scientifically formulated to accelerate vegetation and root growth. Powered by Nexus Technologies, Foundation contains 3 sources of nitrogen, 2 sources of phosphorous, phosphorous acid, proprietary plant extract hormones, and select micronutrients. These chemistries are synergistically built for two reasons: establish quick germination and long-lasting vegetation. Foundation significantly increases nutrient use, drives roots, growth hormones accelerate germination, micros assist in early stages of growth.

Replenish 5-4-5

The most complete plant and soil food on the market today and is the 'flagship' of the EarthWorks product portfolio. Formulated Natural Organic fertilizer that can be used for any plant or ornamental application without fear of burn or salt build up. Replenish products feed the plant and soil. The rich carbohydrates provide a quick burst of energy to beneficial bacteria, the humic acid complex provides a sustainable food source for long-term biological activity, and the minerals replenish the soil with the nutrients.

NutriSCAPE 14-14-14

Flowering 14-14-14 is a premium fertilizer for maintaining ornamental landscape plants such as foundation plantings, shrubs, ground covers, trees, roses, and flowers. 14-14-14 features a 1:1:1 nutrient ratio, ideal for establishment, flowering, and managed vegetative growth. It contains the secondary nutrients Magnesium and Sulfur, as well as the micronutrients Iron and Manganese, for increased vigor and exceptional foliage. 14-14-14 contains 70% Methelene Urea for long term feeding.

Hydra-Fuse 18-0-6

A core fertility foliar NPK combined with phosphite and proprietary biostimulants derived from desert plant extracts. Designed to provide a consistent and lasting color response while enhancing stress resistance and encouraging root growth. Hydra-Fuse contains 6% potassium derived from Potassium Acetate (KA) for superior uptake. Hydra-Fuse's 50% Triazone N provides a tremendous color response with a predictable growth curve. Low salt index. No phosphates. No nitrates. No chlorides.

Yield Starter 3-17-17

The lowest use rate phosphorous available. This immediately available eco-friendly orthophosphate immediately kick-starts the germination process of new seedlings. Then the addition phosphorous liberating bacterial inoculants unlocks phosphate and micronutrients tied up in the soil. University research has demonstrated faster, more vigorous, and more consistent growth on a variety of plants.

Myco-Replenish 3-3-3 w/ Mycorrhizae

Combines the high quality of EarthWorks Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. Myco-Replenish is ideal for any landscape planting situation, establishment of grass seed or sod and will enhance all soil aeration practices. An extensive amount of Mycorrhizae fungi in combination with the known value of the Replenish compost fertilizer will help to promote extensive root growth, reduce heat and drought stress, improves water and nutrient uptake and can eliminate transplant shock.

Guaranteed Analysis:

2.10% Water Insoluble Nitrogen	3.00% Soluble Potash (K2O)
0.90% Other Water Soluble Nitrogen	6.00% Calcium
3.00% Available Phosphate (P2O5)	0.20% Iron

ORNAMENTAL FERTILITY



Replenish 3-4-3

OMRI certified 3-4-3 is 100% egg layered poultry compost. A very effective form of top dressing fertilizer and an important part of many soil programs. The compost used in this product is all egg layer waste, which is very high in calcium, carbon and naturally occurring minerals. 3- 4-3 has gone through two separate digestion cycles, one in the bird and one in the composting facility. The dual process allows all the minerals not used by the bird to become a part of the fertilizer, adding more microbial richness.

Sea 3

A unique liquid organic fertilizer formulated from three distinctive sea based nutrient sources: fish meal, kelp meal and sea water extracts. It is designed to feed the plant with nutrients that are stabilized with a host of carbon sources that allow the nutrients to stay in soil solution longer and allow the plant to take them up more completely. Carbon is the food stuff for microorganisms in the root zone that provides them the energy to freely multiply. As these microbes multiply, they release nutrients tied up in the soil. Sea 3™ provides layers of carbon from sources like kelp meal, fish meal, humic acids, and worm compost extracts.

NutriSCAPE 12-3-6

NutriSCAPE 12-3-6 is specially formulated for Azaleas, Conifers, Rhododendrons, and Evergreens that thrive in acidic soil. NutriSCAPE is also ideal for fertilizing plants where micronutrient availability is limited by high soil pH. NutriSCAPE will aid in maintaining a slightly acid soil pH which is ideal for most evergreens and foundation plants. 70% Methelene Urea, NutriSCAPE is high active nitrogen source that provides extended feeding without the need for coatings. Microbial release allows Methelene Urea to release nitrogen when the plant needs it the most. The result is a quick color response with no surge growth and a consistent and reliable long-term feeding schedule.



Roots MYCOspikes

MYCOspikes provide a comprehensive feeding solution for healthy trees and shrubs. Each spike incorporates vital macro and minor nutrients. Additionally, MYCOspikes combine the proven ROOTS organic-based complex with 18 strains of mycorrhizae. This unique combination of nutrients, stress reducing compounds and uptake enhancing mycorrhizae work together in the feeder root zone. For use around trees and shrubs.

BioVantage

Active Ingredients include: Bacillus amyloliquefaciens, Bacillus licheniformis, Bacillus megaterium, Bacillus methylotrophicus and bacillus subtilis. Combines biological inoculants with liquid organic fertilizer formulated with three distinctive nutrient sources: fish, kelp meal and seawater extracts. They're designed to enhance the potency of the Rhizobacteria package. The Rhizobacteria produce metabolites that regulate both microbial and plant processes. These polymicrobial PGPR's are extremely stable, extending BioVantage's performance and shelf life.

NutriSCAPE 18-5-10

18-5-10 features Methelene Urea, slowly active nitrogen. Long preferred by professional growers for long-lasting feeding with 70% controlled release nitrogen, 18-5-10 is the ideal labor saving single application topdress for feeding trees, shrubs, groundcovers, and other landscape ornamentals. NutriSCAPE is high active nitrogen source that provides extended feeding without the need for coatings. Microbial release allows Methelene Urea to release nitrogen when the plant needs it the most.





Country Club MD 11-7-21

Country Club® MD 11-7-21, the premier homogeneous, greens-grade fertilizer, utilizes Meth-Ex® high-activity nitrogen that delivers excellent color response and maximum long-term feeding. Country Club MD 11-7-21 contains sea plant kelp meal and humic acid, both of which assist the turf plant in achieving its performance potential and aids in regeneration of healthy soils. 40 lb. SGN: 80

Guaranteed Analysis:

1.5% Ammoniacal Nitrogen	8.4% Sulfur
2.0% Water Insoluble Nitrogen	1.0% Magnesium
3.9% Urea Nitrogen	2.0% Iron
3.6% Water Soluble Nitrogen	1.0% Manganese
7.0% Available Phosphate (P ₂ O ₅)	1.0% Humic Acid
12.0% Soluble Potassium K ₂ O	

Country Club MD 12-24-8 40% Meth-Ex

Country Club® MD, the premier homogeneous, greens-grade fertilizer, utilizes Meth-Ex® high activity nitrogen that delivers excellent color response and maximum long-term feeding. Country Club MD 12-24-8 contains sea plant kelp meal and humic acid. Turf treated with sea plant kelp meal and humic acid will outperform untreated turf in overall quality and playability during stressful condition. 40 lb. SGN: 80

Guaranteed Analysis:

5.0% Ammoniacal Nitrogen	24% Available Phosphate (P ₂ O ₅)
1.5% Water Insoluble Nitrogen	8.0% Soluble Potassium (K ₂ O)
2.8% Urea Nitrogen	2.6% Sulfur
2.7% Water Soluble Nitrogen	1.0% Humic Acid

Country Club MD 18-0-18 64% Meth-Ex

Country Club® MD 18-0-18, the premier homogeneous, greens-grade fertilizer, utilizes Meth-Ex® high-activity nitrogen that delivers excellent color response and maximum long-term feeding. Country Club MD 18-0-18 contains sea plant kelp meal and humic acid, both of which assist the turf plant in achieving its performance potential and aids in regeneration of healthy soils. 40 lb. SGN: 80

Guaranteed Analysis:

4.0% Ammoniacal Nitrogen	6.6% Sulfur
3.6% Water Insoluble Nitrogen	1.0% Humic Acid
4.0% Urea Nitrogen	1.6% Iron
6.4% Water Soluble Nitrogen	0.5% Manganese
18% Soluble Potassium (K ₂ O)	

Country Club MD 10-18-18 64% Meth-Ex

Country Club® 10-18-18 is an excellent product to deliver equal amounts of phosphorus and potash with exceptional nitrogen package. SOP delivers potassium and also sulfate sulfur, increasing turf hardness and ability to resist stress while maximizing color. 50 lb. SGN 145

Guaranteed Analysis:

5.2% Ammoniacal Nitrogen	18% Soluble Potassium (K ₂ O)
2.2% Water Insoluble Nitrogen	7.0% Sulfur
1.3% Urea Nitrogen	0.25% Manganese
1.3% Water Soluble Nitrogen	0.5% Iron
18% Available Phosphate (P ₂ O ₅)	0.5% Magnesium

Country Club MD 12-0-24

Country Club® MD 12-0-24, the premier homogeneous, greens-grade fertilizer, utilizes Meth-Ex® high-activity nitrogen that delivers excellent color response and maximum long-term feeding. Country Club MD 12-0-24 contains sea kelp meal and humic acid, both of which assist the turf plant in achieving its performance potential and aids in regeneration of healthy soils. 40lb. SGN: 80

Guaranteed Analysis:

0.9% Ammoniacal Nitrogen	9.5% Sulfur
2.4% Water Insoluble Nitrogen	0.5% Magnesium
4.5% Urea Nitrogen	1.6% Iron
4.2% Water Soluble Nitrogen	0.5% Manganese
12.0% Soluble Potassium (K ₂ O)	1.0% Humic Acid

Country Club MD 16-0-8

Country Club® MD 16-0-8, the premier homogeneous, greens-grade fertilizer, utilizes Meth-Ex® high-activity nitrogen that delivers excellent color response and maximum long-term feeding. Country Club MD 16-0-8 contains sea plant kelp meal and humic acid, both of which assist the turf plant in achieving its performance potential and aids in regeneration of healthy soils. 40 lb. SGN: 80

Guaranteed Analysis:

14.6% Ammoniacal Nitrogen	2.6% Sulfur
1.4% Urea Nitrogen	1.0% Humic Acid
20% Sulfur	1.0% Iron
0.5% Manganese	

Country Club 8-4-24 64% Meth-Ex

Country Club® MD 8-4-24, the premier homogeneous, greens-grade fertilizer, utilizes Meth-Ex® high-activity nitrogen that delivers excellent color response and maximum long-term feeding. Country Club MD 8-4-24 contains sea plant kelp meal and humic acid, both of which assist the turf plant in achieving its performance potential and aids in regeneration of healthy soils. 40 lb. SGN: 125

Guaranteed Analysis:

1.7% Ammoniacal Nitrogen	24% Soluble Potassium (K ₂ O)
1.6% Water Insoluble Nitrogen	5.2% Sulfur
1.9% Urea Nitrogen	1.0% Humic Acid
2.8% Water Soluble Nitrogen	2.4% Iron
4.0% Available Phosphate (P ₂ O ₅)	1.0% Manganese

Country Club 8-4-24 68% Meth-Ex

A fairway sized, homogeneous fertilizer based on methylene urea controlled release nitrogen and produced using LebanonTurf's Composite Technology® granulation process. 18-4-12 is specifically formulated for use on high-quality, low-cut turf areas. 90% of Meth-Ex's nitrogen package is delivered to the plant in 12-16 weeks. SGN: 145

Guaranteed Analysis:

4.0% Ammoniacal Nitrogen	12% Soluble Potassium (K ₂ O)
3.1% Water Insoluble Nitrogen	9.6% Sulfur
3.4% Urea Nitrogen	2.0% Magnesium 0.8% Iron
7.5% Water Soluble Nitrogen	0.4% Manganese
4.0% Available Phosphate (P ₂ O ₅)	

SURFACTANTS AND ADJUVANTS



Hydra-Knight

Hydra-Knight is a 98% Active Ingredient blend of 3 unique polymers. This universal work-horse contains two block polymers: Penetrant, Uniform hydration + 1 Reverse Block Polymer for water retention. Contains high load of natural biostimulant + SAR Elicitors. Polymers: 45% Wetter. 45% Penetrator. 10% Holder. Natural biostimulant + SAR Elicitors provide foliar uptake; if not watered in (foliar and root absorbed).

Hydra-Last

90 day soil surfactant. A blend of three high-performance branched polymers designed for unmatched soil surfactant longevity. This unique chemistry is extremely safe for applications on cool and warm season turf. Perfect for fairways and areas that have limited access where turf managers would prefer to make only one or two applications a year. Delivers uniform hydration, penetration, and rewetting with extremely low risk of phytotoxicity.

Rates:

16 oz. / 1000 - one application
8 oz. + 8 oz. - (1 to 2 week intervals)

Hydra-Firm

100% active ingredient product formulated to deliver uniform hydration, rapid rewetting, and a firm, dry playing surface. A premium product for turfgrass managers who want a very high performance putting surface. Hydra-Firm is a blend of two capped tri-block polymers. This tri-block configuration means that there are three attachment points per molecule that secure the polymers to the soil particle for more uniform and thorough hydration than other competitive products while resisting microbial degradation and surfactant failure.

Rates:

5.0 - 8.0 oz. / 1000 every 30 days
2.5 oz. / 1000 every 14 days

Hydra-Push 5-0-0

A comprehensive combination of dual-mode surfactants, surfuric and amino acids, calcium, and HydraSmart's exclusive nutrient efficiency polymer. Penetrates water through hydrophobic soils and moves water latterly where needed. Flushes bicarbonates and sodium off the colloid. Strategically developed for push-up greens, Hydra-Push is a cost effective surfactant for fairway injections.

Rates:

Push-Up Greens: 6 to 9 oz. / 1000
Injection: 0.5 to 2.0 oz. / 1000

Hydra-Pellets

A non-foaming pelletized soil surfactant with 100% active ingredient designed for spot treatment of hydrophobic areas and "hot spots" on greens. Designed for applications in standard hand-watering guns, Hydra-Pellet is safe to apply on greens, will not crumble during use, and will easily treated two greens per pellet.

Typical Rate:

One pellet will treat at least two greens

Package Size:

12 x 6 oz.

Vivax

A combination of new surfactant technologies designed to manage water across a wide range of soil and turf types, making it ideal for use on golf courses and sports turf. Effective in programs that increase microbial populations. Improves soil solubility and soil hydration. Contains four surfactant technologies. Reduces surface tension - Less run-off and wasted water.

Rates:

Spray: 5 oz. / 1000 sq. ft.

Duplex

Designed for irrigation injection, Duplex™ combines penetrants with a buffering agent that neutralizes hard water ions. Duplex improves the infiltration of rainfall or irrigation through thatch, moving water, plant protectants or nutrients into the soil solution. Great application when applying pesticides that need to breakthrough surface tension to reach targeted pest.

Rates:

Injection: 20 oz. / acre
Spray: 0.5 to 1.0 oz. / 1000 sq. ft.

Magnus

A nonionic surfactant blend engineered with a hydrophilic-lipophilic balance that produces uniform hydration in the root zone and optimized growing conditions for new seedlings, stressed turf and upper root zone species. Compatible with most plant protectants, does not require post-application irrigation.

Rates:

Spray: 4 to 6 oz. / 1000 sq. ft.

Cascade Plus

The industry's flagship wetting agent, a combination of nonionic surfactants that hydrate the soil and penetrate to provide deeper, more uniform water infiltration, Cascade Plus™ is used to prevent localized dry spot (LDS), correct hydrophobic soil conditions and provide firmer, faster playing surfaces under all conditions. Produces firmer, faster playing surfaces. Improves irrigation efficiency, conserves water.

Rates:

Spray: 4 to 16 oz. / 1000 sq.ft.

Alypso Infiltration

Unique, naturally-derived surfactant that speeds up the infiltration of irrigation through thatch and into hard-to-wet soils often encountered on golf courses and athletic fields. Using Alypso helps turfgrass managers produce superior playing surfaces by moving water into the root zone and improving the uptake of soluble nutrients. Low use rates with application flexibility.

Rates:

Injection: 1 pint / acre Spray: 0.36 to 0.5 oz. / 1000 sq. ft.

SURFACTANTS AND ADJUVANTS



Entre - For Systemic Pesticides

Entre is a blend of lecithin and penetrating technologies designed to increase pesticide and nutritional performance. Used with systemic fungicides, growth regulators and insecticides, this foliar adjuvant serves as an activator, penetrant, anti-drift, and deposition aid.

To the Plant: Drift reduction with performing sized droplets

Cover the Plant: Droplet retention by adhesion & spreading

Entry: Increased penetration without cuticle disruption

pH Buffer: Reduced spray solutions pH with acidification properties

Rate:

16 - 32 oz. / 100 gallons

Hydra-Stik - For Contact Pesticides

A blend of organosilicone-based spreaders and latex-based stickers. This combination of high-performance chemistries ensures unmatched spreading and leaf coverage, combined with a superior stick and rainfastness. Rainfast in 30 minutes. Enhances pesticide performance by ensuring droplet retention and reduced pesticide wash off in both low and high volume spray applications.

Rates:

8 - 32 oz. / 100 gallons

Hydra-80

This low-foaming, nonionic surfactant provides superior coverage and penetration of spray solutions on tough-to-control weeds. In addition, Hydra-80/20 contains a proprietary blend of humectants, which have proven to keep the herbicide wet to allow full penetration into the cuticle. Traditional 80/20 blends do not assist in this process, leading to the herbicide drying out on the plant too fast.

Rates:

1 - 4 pints / 100 gallons

Hydra-Tonic MSO

A 100% high concentrate methylated seed oil (MSO) surfactant, Hydra-Tonic is designed to improve performance of post-emergence herbicides and other pesticides. This first-class product is ideal in areas where critical coverage is a must. When it comes to Hydra-Tonic, less is more. This high concentrate formula was specially designed for a low use rate – saving you time and money.

Rates:

1 - 2 pints per acre

Hydra-pHix

A spray tank citric-based, pH reducer. Hydra-pHix modifies spray solution when breakdown from alkaline hydrolysis can reduce pesticide performance.

Use Rate:

4 to 8 ounces per 100 gallons of water.

Hydra-Nix-It

Foam suppressant quickly defoams spray solutions containing nonionic surfactants, silicone surfactants or crop oil concentrates. General purpose antifoamer and defoamer. Prevents foam spillover.

Use Rates:

Add in at 2 oz. increments until foam dissipates.

SMS 700

SMS 700 is a proprietary blend of soil surfactants specially formulated to provide a flexible tool to combat soil hydrophobicity and localized dry spot (LSD). Apply 7 oz. per 1000 sq. ft. in at least 2 gallons of water. Follow up the first treatment 7-10 days later with another 7 oz. Also available in a granular spreadable solution.

SMS 700G

SMS 700 G is the same great chemistry as SMS 700 in an easy-to-spread granular formulation. SMS 700 G is formulated for use by golf course superintendents or professional turf managers. Apply 6.5 pounds per 1000 sq ft. for up to 90-day performance. Additional applications may be necessary throughout the growing season, if so apply at 3.5 pounds per 1000 sq ft.

SMS 400

SMS 400 is designed to produce uniform soil hydration in the upper root zone and to reduce the amount of time spent hand watering or syringing. By improving soil hydration with SMS 400, you maximize the efficiency of irrigation and fertilization inputs. Use Rates: 4 oz. per 1000 sq. ft. every 21 to 28 days.

SMS 200

SMS 200 is specifically formulated to enhance the infiltration and penetration of irrigation and rainfall. SMS 200 sequesters a wide range of hard water ions, therefore augmenting infiltration. As a result, use of SMS 200 allows the turf manager to maximize net efficiencies from irrigation and fertilizer applications.

Vivax Tabs Hydration & Filtration

Contains the same surfactants as Vivax™ within an easy-to-use tablet. Vivax Tabs are designed to improve water infiltration into and throughout localized dry spots (LDS) and provide relief from plant stress across a wide range of soils and turf types. Self-contained tablets fit hose-end applicators. Can be used alone or as part of a comprehensive water management program. Package Size: 24-6 ounce tablets per case.

Rates: One tablet covers approximately 12,000-18,000 square feet of turf.

DIRECT PLANT PROTECTION PARTNERS



Syngenta

Syngenta's commitment to the industry goes far deeper than the products they manufacture. They take great pride in partnering with organizations that empower turf professionals and their respective industries. With a robust team of agronomic experts, district managers as well as four field technical representatives, Syngenta strives to provide support to help manage your turf.



Bayer CropScience

Bayer

When you're Backed By Bayer, you have expert information at your fingertips, and innovative business tools to increase efficiency. You get access to the top minds and best incentives in the industry, plus opportunities to connect with your peers, and with us. Backed By Bayer means your confidence goes up and your stress goes down.



BASF

BASF Turf and Landscape delivers innovative solutions for turfgrass managers and superintendents who seek healthy, improved turf quality. To do this, BASF offers a broad portfolio of pest management products to control weeds, disease and insects while providing Plant Health benefits, ensuring greener, healthier turfgrass.



Nufarm

Nufarm is a leading supplier of plant protection products for the professional turf and ornamental markets. Offering a diversified product portfolio that includes herbicides, insecticides, fungicides and plant growth regulators that can be used in a variety of markets nationwide, Nufarm also devotes substantial resources to innovation for superior solutions for customers plant protection needs.



Corteva

Corteva provides a variety of products that meet the needs of the turf and ornamental markets. Their research with strategic partners is bringing breakthrough and sustainable solutions to the industry. Corteva works with its distributor partners in a unique way to better understand what the market desires, investing in R&D to bring sustainable innovation to the industry.



FMC

FMC Professional Solutions has listened carefully to turf and ornamental managers in order to create an extensive portfolio of solutions designed to help you efficiently maintain beautiful turf and landscapes across the world. FMC is proud to support the industry through valuable services and promotions, and through their involvement in national industry organizations.



SePro

A research-based life sciences company providing innovative products and services for the specialty turf and landscape industries worldwide. The industry leader in turf PGR's, SePro is dedicated to providing golf course superintendents and landscape professionals with effective and dependable turf management solutions.



Primeraturf

Primeraturf is a purchasing cooperative for independent distributors working with turf and landscape managers across the country. Primeraturf supplies its membership with a large portfolio of quality university and field proven Primeraturf® plant protection technologies.



PBI-Gordon

PBI-Gordon was one of the first companies to recognize the unique needs of the golf and landscape industry, first developing some of the most unique herbicides and plant protection solutions. Some of which are still used today - a half-century later. PBI continues to reinvent the herbicide market continuously bringing higher quality solutions to turf and ornamental managers.

FUNGICIDE SOLUTIONS

Product	Supplier	UOM	Active Ingredient	FRAC Code	Turf Rate / 1000
26GT	Bayer	2.5 Gal.	22.3% Iprodione	2	3 to 8 oz.
26/36	Nufarm	2.5 Gal.	19.5% Iprodione 19.5% Thiophanate-methyl	2 & 1	2 to 4 oz.
26019	Bayer	2.5 Gal.	22.3% Iprodione	2	1.5 to 4 oz.
3336	Nufarm	2.5 Gal.	41.25% thiophanate-methyl	1	2 to 6 oz.
Armada	Bayer	3 lb.	41.67% Triadimefon 8.3% Trifloxystrobin	3 & 11	0.6 - 1.2 oz.
Affirm	Nufarm	3 x 2.4 lb.	11.3% Polyoxin D zinc salt	19	0.06 oz.
Appear	Nufarm	2 Gal.	53% Potassium Phosphite	33	3 to 8 oz.
Ascernity	Syngenta	1 Gal. 10 Gal.	2.24% Benzovindiflupyr 7.48% Difenconazole	7	1 oz.
Banol	Bayer	1 Gal.	66.5% Propamocarb hydroxide	28	1.3 to 4 oz.
Banner Maxx	Syngenta	1 Gal. 10 Gal.	14.3% Propiconazole	3	0.5 to 4.0 oz.
Bayleton	Bayer	22 oz.	50% Triadimefon	3	0.5 to 2.0 oz.
Bayleton Flo	Bayer	2.5 Gal.	43% Triadimefon	3	0.25 to 2.0 oz.
Briskway	Syngenta	1 Gal.	18.2% Azoxystrobin 11.4% Difenconazole	3 & 11	0.5 to 1.2 oz.
Concert II	Syngenta	2.5 Gal.	2.9% Banner Maxx 38.5% Daconil	3 & M5	1.5 to 8.5 oz.
Contend A & B	Syngenta	1 Gal.	Benzovindiflupyr, Difenconazole, Azoxystrobin, Propiconazole	3, 7 & 11	1 oz.
Daconil Action	Syngenta	2.5 Gal.	53.94% Chlorothalonil .11% Acibenzolar	M5 & P	1 to 5 oz.
Daconil Ultrex	Syngenta	4 x 5 lb.	82.5% Chlorothalonil	M5	0.11 to 0.46 oz.
Daconil Weatherstik	Syngenta	2.5 Gal.	54% Chlorothalonil	M5	2.5 to 5.5 oz.
Daconil ZN	Syngenta	2.5 Gal.	38.5% Chlorothalonil	M5	3 to 5 oz.
Densicor	Bayer	TBD	Prothioconazole	3	4.3 to 8.5 oz.
Eagle	DOW	Pint 1 Gal.	19.1% Myclobutanil	3	0.5 to 2.4 oz.
Emerald	BASF	10 x .49 lb. 50 x .49 lb.	70% Boscalid	7	0.13 to 0.18 oz.
Enclave	Quali-Pro	2.5 Gal.	28.7% CTN + 9.4% Ipro + 9.4% T-Methyl + 2.8% Teb	M5, 2, 1, 3	3 to 8 oz.
Exteris	Bayer	2.5 Gal.	1.19% Fluopyram 1.92% Trifloxystrobin	7 & 11	1.5 to 6 oz.
Fame SC	FMC	Pint 1 Gal.	40.3% Fluoxastrobin	11	0.18 to 0.36 oz.
Fame + C	FMC	2.5 Gal.	2.44% Fluoxastrobin 38.4% Chlorothalonil	11 & M5	3 to 6 oz.
Fame + T	FMC	1 Gal.	18% Fluoxastrobin 25% Chlorothalonil	11 & 3	0.45 to 0.9 oz.
Fiata Stressgard	Bayer	2.5 Gal.	28.85% Phosphorous Acid + Stressgard	33	5 to 15 oz.

FUNGICIDE SOLUTIONS

Product	Supplier	UOM	Active Ingredient	FRAC Code	Turf Rate / 1000
Fore	DOW	48 lb.	80% Mancozeb + Rainshield Pigment	M3	4 to 8 oz.
Heritage Action	Syngenta	1 lb. 6 lb.	50% Azoxystrobin 1.18% Acibenzolar	11	0.2 to 0.4 oz.
Heritage	Syngenta	1 lb. 6 lb.	50% Azoxystrobin	11	0.2 to 0.4 oz.
HeritageTL	Syngenta	1 Gal. 10 Gal.	8.8% Azoxystrobin	11	1 to 2 oz.
Headway	Syngenta	1 Gal. 10 Gal.	5.73% Azoxystrobin 9.54% Propiconazole	11 & 3	0.75 to 5.5 oz.
Honor	BASF	3 lb.	16.8% Pyraclostrobin 11.2% Boscalid	11 & 7	0.55 to 1.0 oz.
Insignia	BASF	122 oz.	23.3% Pyraclostrobin	11	0.4 to 0.7 oz.
Instrata	Syngenta	2.5 Gal.	29.9% CTN + 1.2% fludioxonil + 4.7% Propiconazole	M5, 12, 3	2.75 to 7.5 oz.
Interface	Bayer	2.5 Gal.	23.1% Iprodione 1.44% Trifloxystrobin	2 & 11	3 to 7 oz.
Kabuto	PBI Gordon	21.8 oz.	36% Isofetamid	7	0.4 to 0.5 oz.
Kalida	FMC	TBD	Fluindapyr/Flutriafol	3, 7	0.25 to 0.41 oz.
Lexicon	BASF	21 oz.	4.33% Fluxapyroxad 28.58% Pyraclostrobin	7 & 11	0.34 to 0.47 oz.
Medallion SC	Syngenta	1 Gal.	11.8% Fludioxonil	12	0.75 to 2.0 oz.
Maxtima	BASF	26 oz./ 2.5 Gal.	34. - 3% Mefentrifluconazole	3	0.2 to 0.8 oz.
Mirage Stressgard	Bayer	2.5 Gal.	21.4% Tebuconazole + Stressgard	3	1 to 2 oz.
Navicon	BASF	37 oz./ 2.5 Gal.	17.56% Mefentrifluconazole/ 17.5% pyraclostrobin	3, 11	0.7 to 0.85 oz.
Nutrol + Prudent 44	Perf. Nutrition	Varies	44% Phosphorous Acid 52% Potassium Phosphate	N/A	Nutrol: 8 lb. / acre P44: 1.5 oz. / 1000
Pedigree	PBI Gordon	2.5 Gal.	40% Flutriafol	7	3.25 oz. (FR)
Pinpoint	NuFarm	4 x 60 oz.	43.4% Mandestrobin	11	0.17 to 0.31 oz.
Posterity	Syngenta	105 oz.	18.3% Pydiflumetofen	7	.08 to .32 oz.
Posterity Forte	Syngenta	1 Gal.	7% Pydiflumetofen, -.3% Azoxystrobin, 11.6% Propiconazole	3, 7, 11	0.42 to 0.84 oz.
Posterity XT	Syngenta	2.5 Gal.	7% Pydiflumetofen, 6% Azoxystrobin, 10.1% Azoxystrobin	3,7,11	0.75 to 3.0 oz.
Propiconazole 41% EC	PrimeraONE	1 Gal.	41% Propiconazole	3	0.18 to 0.73 oz.
Prostar	Bayer	4 x 3 lb.	70% Flutolanil	7	
Rayora	FMC	2.5 Gal.	11.8% Flutriafol	3	0.7 to 1.4 oz.
Renown	Syngenta	2.5 Gal.	45% Chlorothalonil 30% Azoxystrobin	M5 & 11	2.5 to 4.5 oz.
Secure	Syngenta	0.5 Gal. 2.5 Gal.	40% Fluazinam	29	0.5 oz.
Secure Action	Syngenta	0.5 Gal. 2.5 Gal.	40% Fluazinam	29	0.5 oz.
Segway	PBI Gordon	39.2 oz.	34.5% Cyazofamid	21	0.45 to 0.9 oz.
Signature Xtra	Bayer	22 lb.	60% Aluminum- tris	33	2 to 6 oz.

FUNGICIDE SOLUTIONS

Product	Supplier	UOM	Active Ingredient	FRAC Code	Turf Rate / 1000
Signature	Bayer	22 lb. 44 lb.	80% Aluminum- tris	33	4 to 8 oz.
Spectro 90	NuFarm	4 x 5 lb.	72% Chlorothalonil 18% thiophanate-methyl	1 & M5	3 to 5.76 oz.
Spotrete F	NuFarm	1 Gal.	43.7% Thiram	M3	3.75 to 7.5 oz.
Stellar	NuFarm	104 oz.	55.4% Propamocarb 5.54% Fluopicolide	28 & 11	1.2 oz.
Subdue Maxx	Syngenta	1 Gal. 10 Gal.	22% Mefenoxam	4	1 oz.
Tartan	Bayer	2.5 Gal.	20.86% Triadimefon 4.17% Trifloxystrobin	3 & 11	1 to 2 oz.
Tebuconazole	PrimeraONE	1 Gal.	38.7% Tebuconazole	3	0.6 oz.
Tekken	PBI Gordon	1 Gal. 2.5 Gal.	5.06% Flutriafol/ 15.18% Flutriafol	3,7	3 oz.
Terrazole	OHP	1 Qt.	44.3% Etridizole	14	2 to 4 oz.
Tourney	NuFarm	5 lb.	50% Metconazole	3	0.3 to 0.37 oz.
Traction	NuFarm	2.5 Gal.	17.0% Flutriafol/ 17.6% Flutriafol	3, 29	1.3 oz.
Trinity	BASF	2.5 Gal.	19.2% triticonazole	3	0.5 to 0.2 oz.
Triton Flo	Bayer	1 Gal.	30.1% Triticonazole	3	0.28 to 1.1 oz.
Union	NuFarm	2.5 Gal.	5.84% Flutriafol/ 3.25% Flutriafol	11, 21	2.9 to 5.75 oz.
Velista	Syngenta	22 oz.	Penthiopyrad	7	0.3 to 0.5 oz.
Xzemplar	BASF	114 oz. 11.4 oz.	26.55% Fluxapyroxad	7	0.16 to 0.26 oz.

DISEASE GUIDE

Spring Dead Spot

Causal Agent:

Ophiosphaerella korrae, Ophiosphaerella herpotricha, and Ophiosphaerella narmari

Susceptible Turfgrass:

Bermudagrass and buffalograss

Symptoms:

Infected bermudagrass shows disease symptoms as it emerges from winter dormancy. Spring dead spot appears as bleached, straw-colored, circular patches.



Summer Patch

Causal Agent:

Magnaporthe poae

Susceptible Turfgrass:

Annual bluegrass, Kentucky bluegrass, and fine-leaf fescue

Symptoms:

Appears as circular or irregularly shaped patches that measure from several inches to several feet. Initially, patches appear as slow-growing thinned or wilted turfgrass. Mature patches are bronzy-yellow to straw-colored.



Take-all Patch

Causal Agent:

Gaeumannomyces graminis var. avenae

Susceptible Turfgrass:

Bentgrass

Symptoms:

Appear as small, circular reddish-brown spot patches. Progress to wilted, circular patches that are brown or bronze-colored and measure up to several feet in diameter. Induced by hot, dry weather. Infected plants have dark-brown roots.



Fairy Ring

Causal Agent:

Basidiomycetes of more than 50 species on native soils

Susceptible Turfgrass:

All species of warm- and cool-season turfgrass

Symptoms:

Vary with causal agents and the environment. Typically, turf symptoms can appear as outer rings that are either darkgreen or brown in color. May be hydrophobic rings or circular areas showing the first signs of wilt.



Powdery Mildew

Causal Agent:

Erysiphe graminis

Susceptible Turfgrass:

Bluegrass, fine fescue, bentgrass, ryegrass, and bermudagrass

Symptoms:

Appears on the leaves as individual tufts of fine, white mycelium. The tufts enlarge & coalesce, causing leaves to have a grayish-white or powdery appearance. Infected turf turns yellow, then tan and brown in color. Mostly affected in shady areas.



Pythium Blight

Causal Agent:

Pythium aphanidermatum, other species

Susceptible Turfgrass:

All turfgrass species, especially Poa

Symptoms:

Appears suddenly during hot, humid weather. This disease causes greasy, brown circular spots that are initially about 3/4 inch to 2 inches in diameter, then rapidly enlarge. The spots are water-soaked and dark-colored early in the morning. Infected patches may appear bronzy-orange in color.



Pythium Root Rot

Causal Agent:

Pythium aphanidermatum, other species

Susceptible Turfgrass:

Poa, bentgrass, bermudagrass

Symptoms:

Typically nondistinctive, can appear as yellow, irregularly shaped patches. Affected turfgrass is thin, off-color, and slow growing, while the root system is stunted with reduced volume and vigor. Foliar mycelium does not occur.



Brown Patch

Causal Agent:

Brown Patch: Rhizoctonia solani

Susceptible Turfgrass:

All species of cool-season turfgrass

Symptoms:

Appears as rings or patches of blighted turfgrass that measure 5 inches to more than 10 feet. Causes leaf spots and "smoke rings" of thin, brown borders around patches. On widebladed turf, lesions develop with tan centers and dark brown to black margins.



DISEASE GUIDE

Anthracnose

Causal Agent:

Colletotrichum cereale

Susceptible Turfgrass:

Poa and creeping bentgrass

Symptoms:

Causes irregularly shaped patches that are yellow to brown in color. Leaf lesions that are yellow with black centers may also occur. Infected shoots are easily detached. The dead foliage and stems also become covered with acervuli – tiny, spined, black fruiting bodies – that require magnification to identify.



Bentgrass Dead Spot

Causal Agent:

Ophiosphaerella agrostis

Susceptible Turfgrass:

Creeping bentgrass and bermudagrass

Symptoms:

Begins as small, sunken reddish-brown or orange-rust spots 1/2 inch in width, growing to 3-4 inches. Some tan tissue in the center and reddish-brown leaves at the edges, possibly developing a green center if left untreated. Distinctive black fruiting bodies of the fungus readily seen with a hand lens.



Dollar Spot

Causal Agent:

Sclerotinia homoeocarpa

Susceptible Turfgrass:

All species: warm- and cool-season turfgrass

Symptoms:

Causes sunken, circular patches that measure up to 2 inches in diameter on golf greens and several inches on higher cut. Patches turn brown to straw color and may coalesce, forming irregularly shaped areas. Infected leaves display small lesions that turn yellow-green to straw color with a reddish-brown border. Lesions can extend full width of leaf.



Red Thread & Pink Patch

Causal Agent:

Red thread – Laetisaria fuciformis

Pink patch – Limonomyces roseipellis

Susceptible Turfgrass:

All turfgrasses, but particularly severe on fine fescue, and perennial ryegrass

Symptoms:

Causes patches that are reddish-brown in color and 1 to 4 inches in diameter up to 2 feet. Pink patch causes a gelatinous mass of pink mycelium with water-soaked leaves.



Gray Leaf Spot

Causal Agent:

Pyricularia grisea

Susceptible Turfgrass:

Perennial ryegrass, tall fescue

Symptoms:

Symptoms first appear as small, watersoaked lesions that turn brown. Lesions may have a yellow halo. Leaf tips will have a twisted or fishhook shape. Mature lesions are tan to gray and have depressed centers with irregular margins that are purple to brown in color.



Yellow Patch (Cool-Season Brown Patch)

Causal Agent:

Ceratorhiza cerealis

Susceptible Turfgrass:

Bentgrass, Poa perennial ryegrass, bermudagrass

Symptoms:

Occurs from fall through spring or as warm- season grasses approach or break dormancy, generally when air temps average 50° - 65°F. Causes rings and patches that are yellow, or reddish-brown; measure 5 inches to several ft. Damage is generally superficial, but thinning can occur during prolonged wet weather.



HELPFUL TOOLS

Nutrients Per Gallon of Product

Mathematical Formula:

Weight per gallon x % Nutrient

Example: 18-3-6

10.58 lbs. per gallon x 18%

1.9 lbs. Nitrogen (Nutrient) per gallon of liquid product

Nutrients Per Ounce of Product

Mathematical Formula:

lbs. Nutrients per gallon divided by 128 ounces

Example: 18-3-6: 1.9 lbs. Nitrogen per gallon

$1.9 / 128 = 0.148$ lbs. Nitrogen (Nutrient) / ounce

HERBICIDE SOLUTIONS

Type	Product Name	Supplier	UOM	Active Ingredient	Description / Uses	Turf Rate / 1000
Pre-Emergent Herbicides	Barricade 4FL	Syngenta	1 Gal., 10 Gal., 30 Gal.	40.7% Prodiamine	Up to 26 weeks crabgrass control with 1 app. Protects ornamentals w/ 30+ weeds controlled	0.22 - 1.1 oz.
	Barricade 65 WDG	Syngenta	5 lb.	65% Prodiamine	Make late summer / fall applications to prevent poa, henbit, chickweed, and more.	0.025 lbs.
	Bensumec 4LF	PBI Gordon	2.5 Gal.	46% Bensulide	Controls annual grasses: crabgrass, Poa & goose as well as many listed broadleaf weeds.	5.8 to 8.8 oz.
	Dimension 2EW	DOW	.5 Gal. 2.5 Gal.	24% Dithiopyr	Crabgrass + 45 other broadleaf and grassy weeds Longer application window b/c of post control.	0.55 to 0.91 oz.
	Dimension Ultra	DOW	20 lb.	40% Dithiopyr	Crabgrass (pre + early post control), Goosegrass, Poa, Chickweed, Henbit, Spurge, plus more.	0.23 to 0.46 oz.
	Echelon 4SC	FMC	2.5 Gal.	13.6% Sulfentrazone 27.3% Prodiamine	Pre-emerg Poa control is just the beginning. Post sedge, goose, small crab, & broadleaf control.	0.18 to 0.83 oz.
	Gallery DF	DOW	1 lb.	75% Isoxaben	LCO industry standard for both pre and post control of grassy and broadleaf weeds.	0.25 to 0.50 oz.
	Gallery SC	DOW	1 Qt. 2 Gal.	45.5% Isoxaben	Prevents growth of over 95 weeds. Labeled for both warm and cool season turf. Spring & Fall apps.	0.3 to 0.7 oz.
	Pendulum Aquacap	BASF	2.5 Gal. 30 Gal.	38.7% Pendimethalin	Economical control on crabgrass and 21 of the most common unwanted grasses + 25 broadleaves.	Ornamental Varies
	Ronstar Flo	Bayer	2.5 Gal.	34.1% Oxadiazon	Controls weeds through shoots, not roots. Doesn't harm healthy turf. Grassy & broadleaves.	1.85 to 2.8 oz.
	Ronstar WSP	Bayer	10 lb.	50% Oxadiazon	Poa, barnyard, carpet, crab, fall panicum, goose, foxtail, wild oats + 30+ broadleaf weeds.	1.5 to 3.0 oz.
	Specticle WSP	Bayer	7 x 2.5 oz. 8 x 0.625 oz.	20% Indaziflarm	Poa, crab, goose, sedges, plus 60 broadleaf weeds. Longer residual + Tank Mix flexibility.	0.11 oz.
	Specticle	Bayer	18 oz. 1 Gal.	7.4% Oxadiazon	Poa, crab, goose, sedges, plus 60 broadleaf weeds. Longer residual + Tank Mix flexibility.	Turf or Ornamental Varies
	Surflan	UPI	2.5 Gal.	40.4% Oryzalin	Labeled for: Ornamentals, Bulbs, Ground Covers. Controls goose foxtail, pigweed, + many others.	Ornamental Varies
	SureGuard SC	NuFarm	64 oz.	44% Flumioxazin	Longest residual pre-emerg on grassy & broadleaf weeds. Enhances speed of glyphosate.	0.21 to 0.42 oz.
	Tower	BASF	1 Gal.	63.9% Dimethenamid	Turfgrass & ornamental pre-emerg; highly effective on small seeded broadleaves & grassy weeds.	0.5 to 1.0 oz.
	Tupersan WP	PBI Gordon	4 lb.	50% Siduron	Industry standard pre-emerg to apply when seeding. Crabgrass, foxtail & barnyard + others.	1.5 to 6 oz.
Post-Emergent Herbicides	4 Speed XT	NuFarm	1 Gal. 30 Gal.	49% 2, 4-D, 4.1% Triclopyr, Dicamba, 0.067% Pyraflufen	Lethal on toughest weeds like wild violet, ground ivy, spurge, oxalis, plantain, and 70+ others.	1.1 to 1.5 oz.
	Acclaim	Bayer	Pint, Gallon	6.59% Fenoxaprop-ethyl	Post control of crabgrass & goosegrass. Rainfast in 1 hr. Suppress Johnsongrass & common bermuda.	0.35 to 1.0 oz.
	Avenue South	PBI Gordon	Gallon	0.7% Penoxsulam; 0.7% Sulfentrazone; 7.28% 2,4-D; 2.06% Dicamba	90 broadleaf weeds for southern warm weather and sensitive warm-season grasses.	1.1 to 1.5 oz.
	Blindside	FMC	0.5 lb.	60% Sulfentrazone 6% Metsulfuron	Fast acting, dual-action works both through foliar and root uptake. 70+ broadleaves and sedges.	C: .075 to .15 oz. W: .15 to .23 oz.
	Celero	NuFarm	1 lb.	75% Imazosulfuron	Controls sedges including established kyllinga. Systemic (SU) that translocates down to the roots.	0.18 to 0.32 oz.
	Celsius	Bayer	10 oz.	8.7% Thlencarbazone, 1.9% Iodosulfuron, 57.4% Dicamba	Post control of crabgrass & goosegrass. Rainfast in 1 hr. Suppress Johnsongrass & common bermuda.	0.5 to 1.13 oz.
	Certainty	Monsanto	1.25 oz.	75% Sulfusulforn	Warm Season: controls broadleaves, sedges and kyllinga. Already contains non-ionic surfactant.	0.75 to 2.0 oz.
	Change Up	NuFarm	2.5 Gal.	51.05% MCPA, 6% Fluroxapyr, 4.17% Dicamba	200+ broadleaf weeds. Great 2, 4-D alternative, while still delivering powerful weed control.	0.46 to 1.1 oz.
	Confront	DOW	1 Gal.	33% Triclopyr, 12.1% clorpyralid	A non-phenoxy herbicide for commercial use only. Used for difficult to manage weeds.	0.37 to 0.74 oz.

HERBICIDE SOLUTIONS

Type	Product Name	Supplier	UOM	Active Ingredient	Description / Uses	Turf Rate / 1000
Post-Emergent Herbicides	Cool Power	NuFarm	2.5 Gal. 30 Gal.	56.1% MCPA, 5% Triclopyr, 3.6% Dicamba	Cool weather conditions. Ester formulation is ideal for winter weed control.	0.9 to 1.9 oz.
	Defendor	DOW	1 Gal.	4.84% Florasulam	When it's too cold for others. Early season broadleaf control. Can apply w/ 1st LCO round.	0.09 oz.
	Dismiss	FMC	6 oz., Pint & .5 Gal.	39.6% Sulfentrazone	Yellow nutsedge & green kyllinga control. Visible in 24 to 48 hr. Attacks foliage and soil.	0.117 to 0.234 oz.
	Drive XLR8	BASF	64 oz.	18.92% Dimethylamine salt of Quinclorac	Improved control of crabgrass, torpedograss, kikuyugrass, broadleaves (clover, speedwell).	1.5 oz.
	Dismiss South	FMC	64 oz.	33.33% Sulfentrazone 6.67% Imazethapyr	Yellow nutsedge & green kyllinga control. Visible in 24 to 48 hr. Attacks foliage and soil.	0.22 to 0.33 oz.
	Escalade 2	Nufarm	2.5 Gal., 30 Gal., 55 Gal.	39.53% 2, 4-D; 5.9% Fluroxypyr; 4.1% Dicamba	Top option for common and tougher to kill broadleaf weeds.	0.75 to 1.1 oz.
	Finale	Gowan	2.5 Gal.	11.33% Glufosinate-ammonium	Absorbed rapidly through tissue, results in 1-4 days. Toughest weeds: poison ivy, thistle & more.	1.5 to 4.0 oz.
	Fusilade II	Syngenta	Quart	24.5% Fluazifop-P-butyl	Post control of perennial & annual grass weeds. Applied over-the-top w/out damage.	Ornamental Varies
	Horsepower	Syngenta	2.5 Gal.,	48.99% MCPA, 5.59% Triclopyr, 4.82% Dicamba	Great non-2, 4-D 3-Way herbicide for common broadleaf weeds.	0.75 to 1.1 oz.
	Katana	PBI Gordon	3 oz.	25% Flazasulfuron	Warm-Season: Kills 58 weeds including: Poa, Tall Fescue, ryegrass. Yellow, Purple and Globe.	.034 to 0.068 oz.
	Kerb	DOW	3 lb.	50% Pronamide	Warm-Season: Pre-emergent and early post on Poa annua on tees, fairways, roughs and greens.	0.73 to 1.46 oz.
	Last Call	NuFarm	2.5 Gal. 30 Gal.	2.7% fenoxaprop, 3.89% fluroxypyr, 2.7% dicamba	Only 3-way containing the benefits of Acclaim. Industry leader for weed and grass control.	1.3 to 1.5 oz.
	Lontrel	DOW	Quart	40.9% Clopyralid	Non-Residential turf. Used for commercial turf including sod farms. Woody ornamentals too.	Ornamental Varies
	Millennium	NuFarm	2.5 Gal., 30 Gal., 55 Gal.	37.32% 2, 4-D; 2.54% Clopyralid; 4.65% Dicamba	Top option for standard broadleaf weeds in cool-season turf. Non-Residential.	0.75 to 1.1 oz.
	Monument	Syngenta	25 Gram	75% Trifloxysulfuron-sodium	Controls certain broadleaves, sedge, and grasses in warm-season turf.	0.53 oz.
	Negate	Quali-Pro	1.5 oz.	16.67% Rimsulfuron; C20% Metsulfuron methyl	Poa annua, poa trivialis, ryegrass, bentgrass, clovers, henbit, chickweed, wild onion, spurge	0.035 oz.
	Ornamec 170	PBI Gordon	1 Qt.	1.70% Fluazifop-P-butyl	Non-Turf: Built-in surfactant, ideal for grass control in ornamental beds, tree wells, fence lines, etc.	Ornamental Varies
	Ornamec OTP	PBI Gordon	1 Gal.	6.75% Fluazifop-P-butyl	Non-Turf: Outstanding post-emergent control of grasses in groundcovers, shrubs, and trees.	Ornamental Varies
	PowerZone	PBI Gordon	2.5 Gal.	0.48% Carfentrazone, 41.98% MCPA 5.39% MCPP, 2.69% Dicamba	Alternative to 2, 4-D formulations, great on oxalis, plantain, ground ivy.	0.75 to 1.5 oz.
	ProDeuce	NuFarm	64 oz.	40.15% Prodiamine; 7.51% Prodiamine	Dual action, combines 2 most trusted herbicides on warm-season turf.	3 to 6 oz.
	Prograss EC	Bayer	2.5 Gal.	19% Ethofulesate	Pre- and post-emergent control of Poa annua in cool-season turf & overseeded bermudagrass.	1.5 to 4.0 oz.
	Prosedge	NuFarm	1.33 oz.	75% Halosuluron-methyl	Even with newer chemistry, still the #1 University recommended nutsedge solution.	1.3 oz. / A
	Pylex	BASF	8 oz.	29.7% topramezone	Standard control for bermuda and goose in cool-season turf. Also, crabgrass, nimblewill and more.	.023 to .034 oz.
	Q4	PBI Gordon	1 Gal. 2.5 Gal	8.43% Quinclorac, 0.69% Sulfentrazone, 11.81% 2, 4-D, 1.49% Dicamba	Yellow Nutsedge, Crabgrass, Foxtail, Chickweed, Clover, Dandelion. Rapid visual response + 1 week reseeding interval.	2.6 to 3.0 oz.
	Quick Silver	FMC	8 oz.	21.3% Carfentrazone-ethyl	Industry standard for moss control. 90% control with just 2 apps. Effective in cool & warm temps.	0.9 to 2.1 oz. / A
	Revolver	Bayer	1 Qt. 87 oz.	2.34% Foramsulfuron	Controls annual and perennial grasses in bermuda, zoysia and buffalograss.	Ryegrass Transition 0.2 to 0.4 oz.

HERBICIDE SOLUTIONS

Type	Product Name	Supplier	UOM	Active Ingredient	Description / Uses	Turf Rate / 1000
Post-Emergent Herbicides	Round Up Pro	Monsanto	2.5 Gal. 30 Gal.	41% Glyphosate	Industry trusted non-selective herbicide zoysia and buffalograss.	2 to 3 oz.
	Round Up Pro Max	Monsanto	1.67 Gal.	48.7% Glyphosate	New and improved version of Round Up. Lower use rates.	1.0 to 1.5 oz.
	Round Up QuikPro	Monsanto	6.8 lb.	73.3% Glyphosate, 2.9% Diquat	Highest Active Ingredient: Water Soluble Granules. Quick burndown.	1.5 to 3.0 oz.
	Sapphire	DOW	1 Gal.	3.68% penoxsulam	Removes Perennial Rye and broadleaf weeds from warm-season grasses during spring.	0.09 to 0.55 oz.
	Scythe	Bayer	2.5 Gal.	57% Pelargonic Acid	Great tank mix partner with broad-spectrum herbicides for quicker burndown.	1 to 4 oz.
	Segment	BASF	1 Gal.	13% Sethoxydim	Only herbicide that can be applied directly to trees or shrubs during growing season.	Grasses: 6": 8 oz. Grasses: 12": 1.4 oz.
	Solitaire	FMC	1 lb.	18.75% Sulfentrazone 56.25% Quinclorac	Over 60 weeds, plus tremendous clean up on crabgrass. Fast and visible response.	C: 0.37 to 0.48 oz. W: 0.37 to 0.74 oz.
	Solitaire WSL	FMC	0.75 Gal.	1.6% Sulfentrazone 5.0% Quinclorac	Over 60 weeds, plus tremendous clean up on crabgrass. Fast and visible response.	C: 4.0 to 6.5 oz. W: 4.0 to 7.9 oz.
	Specticle Total	Bayer	1.125 Gal.	0.089% Indazifarm; 0.89% Diquat; 20.46% Glyphosate	Industry's best Specticle pre\$mixed with Diquat & glyphosate. Kill it and prevent it from returning.	16 oz.
	Speedzone	PBI Gordon	2.5 Gal., 30 Gal., 55 Gal.	0.62% Carfentrazone, 28.57% 2, 4-D, 5.88% MCPA, 1.71% Dicamba	Industry standard. Great alternative to clopyralid. Clover, dandelion, oxalis, ground ivy and more.	1.1 to 1.8 oz.
	Speedzone Southern	PBI Gordon	2.5 Gal. 30 Gal.	0.54% Carfentrazone, 28.57% 2, 4-D, 0.67% Dicamba	Formulated for sensitive southern grasses, fast control of clover, plantain, ground ivy, and spurge.	0.75 to 1.8 oz.
	SquareOne	FMC	0.5 lb.	3.9% Carfentrazone 66.1% Quinclorac	Designed for newly seeded turf, dual combination. Crabgrass and 60+ tough weeds.	C: 0.18 to 0.28 oz. W: 0.28 to 0.41 oz.
	Super Trimec	PBI Gordon	2.5 Gal. 30 Gal.	32.45% 2,4-D; 15.9% 2,4-D-P; 5.38% Dicamba	Rapid and thorough foliar absorption; 75 broadleaf weeds; including plantain, henbit, and kudzu.	0.75 oz.
	Surge	PBI Gordon	2.5 Gal. 30 Gal.	0.67% Sulfentrazone, 18.79% 2, 4-D 6.8% MCPP, 3.02% Dicamba	Late Spring / Early Summer. Great on knotweed, plantain, oxalis + yellow nutsedge supression.	1.2 to 1.5 oz.
	Tribute Total	Bayer	6 oz.	9.9% Thiencarbazon 19.8% Foramsulfuron 39.5% Halosulfuron	Annual & Perennial Grass Weeds, Sedges and Kylingas, & Broadleaf Weeds, Removal of Overseeded Ryegrass in Bermudagrass.	0.023 to 0.15 oz.
	Trimec 1000	PBI Gordon	2.5 Gal., 30 Gal. 55 Gal.	34.59% 2,4-D; 1.22x% 2,4-D(DMA); 8.17% MCPP; 2.68% Dicamba	Low Odor; four powerful ingredients formulated to translocate through plant and into root.	1.1 to 1.5 oz. Bent: 0.66 oz.
	Trimec Bent	PBI Gordon	1 Gal. 2.5 Gal.	9.92% MCPA, 6.12% 2, 4-D, 2.53% Dicamba	Dandelion, Chickweed, Knotweed, Plantain, Henbit, Spurge, and many others.	1 oz.
	Trimec Encore	PBI Gordon	2.5 Gal., 30 Gal. 55 Gal.	38.68% MCPA; 8.16% MCPP; 3.81% Dicamba	2,4-D alternative. More than 50 weeds listed. Including ground-ivy.	1.1 to 1.5 oz.
	Trimec Southern	PBI Gordon	1 Qt., 1 Gal. 2.5 Gal.	17.37% 2,4-D; 18.74% MCPP-P; 3.85% Dicamba	Accomdates sensitive warm-season turf. 90 broadleaf weeds; including spurge and henbit.	Bermuda: 0.75 oz. Zoysia: 0.75 oz. St. Augustine: 0.55 oz.
	Trimec T-zone	PBI Gordon	2.5 Gal., 30 Gal., 55 Gal.	7.72% Triclopyr; 0.66% Sulfentrazone; 29.32% 2,4-D; 2.22% Dicamba	Tough weeds. Compares to 4 Speed XT; kills wild- violet, ground-ivy, supression of young nutsedge.	0.75 to 1.5 oz.
	Triplet	NuFarm	2.5 Gal., 30 Gal., 55 Gal.	30.56% 2, 4-D; 8.17% MCPA, 2.77% Dicamba	Avg. option for Dandelion, Clover, Henbit, Wild Onion and other broadleaf weeds.	1.25 to 2.0 oz.
	Triplet Low Odor	NuFarm	2.5 Gal., 30 Gal., 55 Gal.	47.33% 2, 4-D; 8.17% MCPA, 2.3% Dicamba	Avg. option for Dandelion, Clover, Henbit, Wild Onion - No Odor	1.25 to 2.0 oz.
	Turflon	DOW	2.5 Gal.	61.6% Triclopyr	Controls Annual and Perennial broadleaf weeds and kikuygrass in ornamentals.	0.37 to 0.74 oz.
	Tenacity	Syngenta	8 oz. 1 Gal.	40% Mesotrione	Pre + Post control of grass & weeds in both cool & warm season turf. Controls bent in roughs.	4 to 8 oz. / A
	Velocity	NuFarm	1 lb.	17.6% Bispyribac-sodium	Gradually eliminates poa annua and poa trivialis. Plus broad spectrum weed control.	Strategy varies
	Xonerate	FMC	9 x 1 oz.	70% Amicarbazone	Eliminates Poa with 90% university proven success. Control occurs over a 3 to 4 week period.	1 to 2 oz.
	Xonerate	FMC	TBD	46.2% Amicarbazone	Poa initially becomes chlorotic, followed by necrosis. Eliminates Poa.	Refer to Label

HERBICIDE QUICK REFERENCE

Use Group	Product													Other	Total lb. A.I. / gal. or lb.	Rate / A (Cool Season)	Supplier
		2, 4-D	MCPA	MCPP-p (MECOPROP-p)	triclopyr	dicamba	2, 4-DP-p	fluroxypyr	clopyralid	pyraflufen	carfentrazone	sulfentrazone	quinclorac				
Premium Broad Spectrum	Millennium Ultra	3.00				0.38		0.18							3.56	2.0 - 3.0 pts.	Nufarm
	Escalade 2	3.20				0.40	0.40								4.00	2.0 - 3.0 pts.	Nufarm
	Change Up		4.00			0.40	0.25								4.80	2.0 - 3.0 pts.	Nufarm
	Last Call					0.25	0.25						0.25 fenoxaprop		0.75	3.5 - 4.0 pts.	Nufarm
	Horsepower		3.80		0.38	0.38									4.56	2.5 pts.	Nufarm
	4-Speed	2.29		0.57	0.23				0.005						3.10	3.5 pts.	Nufarm
	4-Speed XT	2.29			0.28	0.28			0.005						2.86	3.5 pts.	Nufarm
	Speed Zone	1.53		0.48	0.14					0.05					2.20	4 pts.	PBI Gordon
	Confront				2.25			0.75							3.00	1 pt.	DOW
	T-Zone	1.75			0.50	0.20					0.06				2.51	3.25 - 4.0 pts.	PBI Gordon
Std. 3-Way	Triplet SF	2.38		0.63	0.21										3.22	3.0 - 4.0 pts.	Nufarm
	Triplet Low Odor	2.38		0.63	0.22										3.23	3.0 - 4.0 pts.	Nufarm
	Trimec 992	2.38		0.63	0.21										3.22	3.25 - 4 pts.	PBI Gordon
	Trimec 1000	2.37		0.65	0.22										3.24	2 - 4 pts.	PBI Gordon
	Trimec Classic	1.98		0.53	0.21										2.72	3.25 - 4 pts.	PBI Gordon
	Trimec 637	3.28		0.55	0.13										3.96	2.3 - 2.7 pts.	PBI Gordon
Ester	Cool Power		3.00		0.30	0.30									3.60	3 pts.	Nufarm
	4-Speed XT	2.29			0.28	0.28			0.005						2.86	3.5 pts.	Nufarm
	Speed Zone	1.53		0.48	0.14					0.05					2.20	4 pts.	PBI Gordon
	Speed Zone Southern	0.52		0.20	0.05					0.04					0.81	4 - 6 pts.	PBI Gordon
	Super Trimec	1.89			0.47	0.94									3.30	2 - 3 pts.	PBI Gordon
Non-2, 4-D	Horsepower		3.80		0.38	0.38									4.56	2.5 pts.	Nufarm
	Cool Power		3.00		0.30	0.30									3.60	3 pts.	Nufarm
	Change Up		4.00		0.40	0.25									4.80	2.0 - 3.0 pts.	Nufarm
	Last Call				0.25	0.25							0.25 fenoxaprop		0.75	3.5 - 4.0 pts.	Nufarm
	Confront				2.25			0.75							3.00	1 pt.	Dow
	Pylex												29.7% topramezone		2.80	1 - 1.5 oz.	BASF
	ProSedge												75% halosulfuron		0.75	0.66 - 1.3 oz.	Nufarm
	Q4 Plus	0.88			0.10					0.06	0.75				1.79	7 - 8 pts.	PBI Gordon
	Dismiss									4.00					4.00	4 - 8 oz.	FMC
	Tenacity												40% Mesotrione		4.00	4 - 8 oz.	Syngenta
Nutsedge	Surge	1.40		0.50	0.22					0.06					2.18	4 pts.	PBI Gordon
	Drive										0.75				0.75	1 lb.	BASF
	Last Call				0.25	0.25							0.25 fenoxaprop		0.75	3.5 - 4.0 pts.	Nufarm
	Q4 Plus	0.88			0.10					0.06	0.75				1.79	7 - 8 pts.	PBI Gordon
	Acclaim Extra												0.57% fenoxaprop		0.57	3.5 - 28 oz.	Bayer
	SquareOne								0.04		0.66				0.70	8 - 12 oz.	FMC
	Solitare									0.19	0.56				0.75	16 - 20 oz.	FMC
	Tenacity												40% Mesotrione		4.00	4 - 8 oz.	Syngenta
	Pylex												29.7% topramezone		2.80	1 - 1.5 oz.	BASF
	Acclaim Extra												0.57% fenoxaprop		0.57	3.5 - 28 oz.	Bayer
Crabgrass or Crab + Broadleaf	ProSedge												75% halosulfuron		0.75	0.66 - 1.3 oz.	Nufarm
	Drive										0.75				0.75	1 lb.	BASF
	Spotlight						1.50								1.50	0.67 - 2.5 pts.	DOW
	Octane								0.177						0.18	0.7 - 1.5 oz.	SePro
	Lontrel							3.00							0.18	0.25 - 1.33 pts.	DOW
	Dismiss										4.00				4.00	4 - 8 oz.	FMC
	Tenacity												40% Mesotrione		4.00	4 - 8 oz.	Syngenta
	Pylex												29.7% topramezone		2.80	1 - 1.5 oz.	BASF
	Quicksilver									1.03					1.03	0.9 - 1.4 oz.	FMC
Single Components																	

HERBICIDE GLOSSARY

2,4 - D: 2,4-Dichlorophenoxyacetic acid

Phenoxy family. Shoot and leaf uptake only. Little to no soil residual. National application restriction of 2 broadcast applications or 2 pounds active ingredient per season. Good control of basic annual broadleaf weeds such as dandelion, but somewhat limited overall control spectrum. Weed and non-target ornamental injury characterized by curling and twisting of leaf and stems.

MCPP-p (Mecoprop-p): (+)-R-2 (2-methyl-4-chlorophenoxy) propionic acid

Phenoxy family. MCPP is not allowed in potential grazing situations. Leaf and shoot uptake only. Little no soil residual.

Dicamba: 3,6-dichloro-o-anisic acid

Shoot and root uptake only. Short (10-14 day) soil residual. Weed and non-target ornamental injury characterized by cupping of leaf. Lilacs and some shallow rooted ornamentals can show mild injury (cupping of leaf).

Fluroxypyr: 4-amino-3,3-dichloro-6-fluoro-2-pyridinyloxy acetic acid

Stand alone brand name: Spotlight. Excellent cool temperature performance. Very broad spectrum of control and known particularly for excellent clover control. Leaf and root uptake with some soil residual. All products containing Fluroxypyr are categorized as "Restricted Use" in New York state.

Carfentrazone: Ethyl,2-dichloro-5 (4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl)-4-fluorobenzenepropanoate

Stand alone brand name: QuickSilver. Broadens weed control spectrum when added to standard 3-way mixes. Speeds reaction time to 24 to 48 hours. Also good results on late season clover. Leaf and root uptake with some soil residual.

2,4-DP-p: (+)-R-2-(Dichlorophenoxy) propionic acid

Phenoxy family. Used as an alternative to Dicamba if Dicamba sensitivity to ornamental plants is an issue. Leaf and shoot uptake only. Good control of basic annual broadleaf weeds such as dandelion, but limited to overall control spectrum. Weed and non-target ornamental injury characterized by curling and twisting of leaf and stems. Little or no soil residual.

MCPA: 2-Methyl-4-Chlorophenoxyacetic Acid

Phenoxy family. Good on legumes, clovers, crawling species and generally small seeded broadleaf weeds. Used as alternative to 2,4-D when national limits are reached or 2,4-D sensitive situations. Leaf and shoot uptake only. Little to no soil residual.

Triclopyr: 3,5,6-Trichloro 2-Pyridinyloxyacetic

Pyridine family of chemistry. Good on tough to control viney or woody weed species. University research reports as one of best A.I. options for Ground Ivy and Wild Violet. Somewhat slow acting compared to phenoxy. Leaf and root uptake with some soil residual.

Clopyralid: 3,6-Dichloro-2-Pyridinecarboxylic Acid

Stand alone brand name: Lontrel. Not registered for use on residential turf. Only non-residential uses such as golf, sports, or commercial turf. Very broad spectrum control and known particularly for its excellent clover and thistle control. All products containing Clopyralid are categorized as "restricted Use" in New York state. Slightly longer residual than Fluroxypyr. Leaf and root uptake with some soil residual.

Sulfentrazone = N-(2,4-dichloro-5-(4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl)phenyl)methanesulfonamide

Stand alone brand name: Dismiss. Broadens weed control spectrum when added to standard 3-way mixes. Primarily used for Nutsedge control or suppression. Speeds reaction time to 24 to 48 hours. Leaf and root uptake with some soil residual.

HELPFUL TOOLS

Rate / Acre	Rate / 1000
1 pint	0.75 tablespoons
1 quart	1.5 tablespoons
1 gallon	6 tablespoons

Amount	Equal Measurements
25 gallon	4.5 pints
50 gallon	4.5 quarts
100 gallon	9 quarts

GRASSY & BROADLEAF WEED GUIDE

Common Chickweed

Structure: Low-growing

Life Cycle: Cool-season annual; disappears in heat

What to look for: Broad oval pointed smooth leaves with star-shaped white blossoms

Growth period: Cool, moist weather - disappears under high temperature stress, seeds germinate from late fall to early spring



Common Lespedeza

Structure: Prostrate, forming mats up to 18" diameter

Life Cycle: Annual

What to look for: Small, purplish flowers and small oval fruits

Growth period: All summer; blooms August through October



Henbit

Structure: Grows erect, up to 16" tall

Life Cycle: Winter annual; reproduces by seeds

What to look for: Pink to purple flowers with hairy upper surfaces on leaves

Growth period: Flowers in early spring; seeds mature from April to June - will disappear under high-temperature stress



Spurge, Prostrate or Spotted

Structure: Prostrate

Life Cycle: Warm-season annual

What to look for: Numerous long, creeping stems tinged with purple which ooze milky fluid when broken

Growth period: Plants appear mid-to late May; blooms June to October

Smooth Crabgrass

Structure: Prostrate or ascending growth with hairless leaves and sheaths, and stems that do not root at the node

Life Cycle: Summer annual

What to look for: Dull green, sometimes purple-tinged leaves with margins that may be rough and sharply pointed, sparsely pubescent near the base, 1" to 4" long, and 1/8" to 1/4" wide

Growth period: Mid-spring through summer



White Clover

Structure: Low-growing with creeping stems that root at nodes

Life Cycle: Cool-season perennial

What to look for: Three dark-green leaflets, white blossoms

Growth period: Spring, summer, and fall



Broadleaf Plantain

Structure: Rosette of large oval leaves, lies flat and tends to suffocate grasses; seedstalks 5" to 10" long rise from center of rosette

Life Cycle: Perennial; reproduces by seeds

What to look for: Low-growing rosette of large round, very slightly tapered leaves; seedstalks rise from rosette

Growth period: June to October



Canada Thistle

Structure: Tall; can grow to 5'

Life Cycle: Perennial

What to look for: Rather tall cluster of extremely spiky leaves first year; typical purplish thistle flower in second year, usually growing in clusters

Growth period: Cool, moist weather - disappears under high temperature stress, seeds germinate from late fall to early spring

Wild Violet

Structure: 2" to 5" tall

Life Cycle: Perennial

What to look for: Heart-shaped leaves, small pansy-like flowers, blue-violet to lilac or white

Growth period: Blooms from March through May - grows best when cool



Dandelion

Structure: Leafless stems of varying lengths grow from center of prostrate rosette and support yellow flower

Life Cycle: Perennial, one of the first plants to bloom in spring - seedlings can appear throughout growing season

What to look for: Bright yellow blossoms, followed by "puffball" seed carriers

Growth period: All summer long



Yellow Nutsedge

Structure: Grows erect, spreads by rhizomes and tubers

Life Cycle: Perennial

What to look for: Yellowish-brown spikelets (flower-like structures) with thick, stiff leaves arranged in sets of three at the base, triangular stems with light-brown flowers and seed

Growth period: Spring through fall



Ground Ivy

Structure: Creeping

Life Cycle: Cool-season perennial

What to look for: Creeping stems several feet long that root at nodes; small blue-violet flowers

Growth period: Spring, summer, and fall

INSECTICIDE SOLUTIONS

Product Name	Supplier	UOM	Active Ingredient	IRAC MoA Class	Primary Site of Action	Sub-group
Acelepryn	Syngenta	64oz.	18.4% Chlorantraniliprole	28	Nerve and muscle	Diamides
Advion	Syngenta	1 Gal.	0.22% Indoxacarb	22	Nerve	Oxadiazines
Aloft	NuFarm	64 oz.	24.7% Clothianidin; 12.3% Bifenthrin	4	Nerve action	Neonicotinoids, Pyrethroids, Pyrethrins
Arena	NuFarm	2.5 lb.	50% Clothianidin	4A	Nerve action	Neonicotinoids
Astro	FMC	1 Gal.	36.8% Permethrin	3A	Nerve action	Pyrethroids, Pyrethrins
Avid	Syngenta	1 Gal.	2% Abamectin	6	Nerve and muscle	Avermectins, Milbemycins
Azatrol	PBI Gordon	1 Gal. 1 Qt.	1.2% Azadirachtin	UN	Unknown	Azadirachtin
Baseline	FMC	1 Qt.	23.4% Bifenthrin	3A	Nerve action	Pyrethroids, Pyrethrins
Chlorpyrifos 4	Post Patent	2.5 Gal.	44.7% Chlorpyrifos	1B	Nerve action	Organophosphates
Conserve	DOW	1 Qt.	11.6% Spinosad	5	Nerve action	Spinosyns
CorTect	Bayer	250 Tabs	20% Imidacloprid + Fertilizer	4A	Nerve action	Neonicotinoids
Dipel Pro	NuFarm	1 lb.	54% Bacillus thuringiensis	N/A	Unknown	Biological
Divanem	Syngenta	0.5 Gal.	2% Abamectin	6	Nerve and muscle	Pyrethroids, Pyrethrins
Dursban 50W	DOW	2.5 Gal.	50% Chlorpyrifos	1B	Nerve action	Organophosphates
Dylox SL	Bayer	2.5 Gal.	37.3% Trichlorfon	1B	Nerve action	Organophosphates
Ferrence	Syngenta	96 oz.	18.66% Cyantraniliprole	28	Nerve and muscle	Diamides
Flagship	Syngenta	2 lb.	25% Thiamethoxam	4A	Nerve action	Neonicotinoids
Floramite	OHP	1 Qt.	22.6% Bifenazate	20D	Energy metabolism	Bifenazate
Forbid	Bayer	8 oz.	45.2% Spiromesifen	23	Lipid synthesis, growth regulation	Tetronic and Tetramic acid derivatives
Hort Oil	Post Patent	2.5 Gal. 30 Gal.	98% Mineral Oil	N/A	Unknown	N/A
Indemnify	Bayer	17 oz.	34.5% Fluopyram	N/A	N/A	N/A
MaxForce	Bayer	10 lb.	0.01% Trifluoromethyl	N/A	N/A	N/A
Meridian WG	Syngenta	17 oz.	25% Thiamethoxam	4A	Nerve action	Neonicotinoids
Merit 75 WP	Bayer	2 oz.	75% Imidacloprid	4A	Nerve action	Neonicotinoids
Merit 75 WSP	Bayer	6.4 oz.	75% Imidacloprid	4A	Nerve action	Neonicotinoids
Merit 2F	Bayer	1 Gal.	21.4% Imidacloprid	4A	Nerve action	Neonicotinoids
Nortica 10WP	Bayer	35 lb.	10% Bacillus firmus	N/A	N/A	N/A
Onyx	FMC	1 Gal.	23.4% Bifenthrin	3A	Nerve action	Pyrethroids, Pyrethrins
Orthene 97	Amvac	1 lb.	97.4% Acephate	1B	Nerve action	Organophosphates
Provaunt	Syngenta	12 oz., 120 oz.	30% Indoxacarb	22A	Nerve action	Oxadiazines
Safari SG	NuFarm		20% Dinotefuran	4A	Nerve action	Neonicotinoids
Scimitar	Syngenta	1 Qt.	9.7% Lambda-cyhalothrin	3A	Nerve action	Pyrethroids, Pyrethrins
Sevin SL	Bayer	2.5 Gal.	43% Carbaryl	1A	Nerve action	Carbamates
Talstar GC	FMC	1 Gal.	7.9% Bifenthrin	3A	Nerve action	Pyrethroids, Pyrethrins
Talstar One	FMC	1 Gal.	7.9% Bifenthrin	3A	Nerve action	Pyrethroids, Pyrethrins
Tempo SC	Bayer	240 ML, 900 ML	11.8% Beta-cyfluthrin	3A	Nerve action	Pyrethroids, Pyrethrins
Tempo WP	Bayer	420 Grams	10% Beta-cyfluthrin	3A	Nerve action	Pyrethroids, Pyrethrins
Tetrino	Bayer	1 Gal.	Tetraniliprole	28	Nerve and muscle	Diamides
Top Choice	Bayer	50 lbs.	0.0143% Fipronil	2B	Nerve action	Phenylpyrazoles
Triple Crown	FMC	1 Gal.	2.7% Zeta-Cypermethrin, 7.87% Bifenthrin, 13.8% Imidacloprid	3A & 4A	Nerve action	Pyrethroids, Pyrethrins Neonicotinoids
Zylam 20SG	PBI Gordon	2.7 lbs.	20% Dinotefuran	4A	Nerve action	Neonicotinoids
Zylam Liquid	PBI Gordon	1 Qt.	10% Dinotefuran	4A	Nerve action	Neonicotinoids

INSECT GUIDE

Chinch Bug

Genus Species:
Blissus Leucopterus

Susceptible Turfgrass:
All Turfgrass, mostly KBG,
PRG, & fine fescues

Symptoms:

Patches of turf turning brown in July or August.

The damage resembles drought stress, but turf damaged from chinch bugs does not recover after a rain. Dead and dying grass plants, and small (1/8 inch) black bugs in the surface duff or thatch when it is scratched or parted.



Japanese Beetle

Genus Species:
Popillia Japonica

Susceptible Turfgrass:
All grass types

Symptoms:

Turf thins in patches in the lawn or in a golf

course fairway; dead patches may appear if a heavy grub infestation is combined with prolonged dry weather in September or October. Skunks and raccoons may turn-over heavily infested turf in search of grubs to eat.



Sod Webworm

Genus Species:
Crambidae spp

Susceptible Turfgrass:
All grass types. Usually low maintenance non- irrigated.

Symptoms:

Small patches (2 - 4 inch diameter) of closely-cropped turf, usually turns brown in a few days. Small patches may coalesce into larger patches. May be irregular in shape. Grass blades pruned off at the crown.



Cutworm

Genus Species:
Agrotis Ipsilon

Susceptible Turfgrass:
Bentgrass, Poa

Symptoms:

Holes on greens and tees, and 'ball-mark' damage where larger cutworms scalp turf in a small circle around the entrance to tunnel. Pencil-sized holes on greens of tees that have been enlarged. June to October.



Ataenius and Aphodius

Genus Species:
Ataenius Spretulus and *Aphodius Granarius*

Susceptible Turfgrass:
Bentgrass and Poa

Symptoms:

Damage found in June and July. 1/4 inch long C-shaped white grubs. They will have 6 legs, a brown head capsule and chewing mouthparts. Yellow or thin patches of turf in golf course fairways in June or July. Sometimes the turf may die in small patches that may coalesce into larger patches.



Bill Bug

Genus Species:
Sphenophorus Parvulus

Susceptible Turfgrass:
Bluegrass, perennial ryegrass, fine fescue

Symptoms:

Lawn turns brown in patches in late July.

Damage more severe next to sidewalks, driveways and around trees. In a "tug test" infested stems tend to break at the crown. Broken-off stems are filled with fine, whitish sawdust. Larvae can be found around roots in stem or soil in July.



European Chafer

Genus Species:
Rhizotrogus Majalis

Susceptible Turfgrass:
All grass types

Symptoms:

Turf thins in patches. Dead patches may appear if a heavy grub infestation is combined with prolonged dry weather. Dead patches in the fall may become bare soil by April. In top 2 inch of soil under infested turf look for C-shaped white grubs 1/2" to 1" long. Six legs, brown head, visible chewing mouthparts.



Annual Bluegrass Weevil

Genus Species:
Listronotus maculicollis

Susceptible Turfgrass:
Poa, some bentgrass types

Symptoms:

Adults emerge from overwintering sites, move to turf areas & feed by cutting notches in edges of grass blades or holes in stems near the leaf bases. Larvae feed by severing stems from plant crown, 1st causing small yellow-brown spots along the edges of fairways, tees and collars. Infestations cause small irregular patches of dead turf. Damage begins to become obvious in late May or early June.



INSECT GUIDE

Masked Chafer

Genus Species:

Cyclocephala Borealis

Susceptible Turfgrass:

All grass types

Symptoms:

Often vertebrate damage is first indication of a Image of Masked Chafer problem. Turf will be dug-up and flipped-over during night. Damaged area will get larger each night. Or, watch for areas of turf that are dying and turning brown. Grass can be pulled back if grubs have removed enough of the roots.



May or June Beetle

Genus Species:

Pyllophaga spp

Susceptible Turfgrass:

All grass types

Symptoms:

March through October. Skunk and raccoon activity may be the first sign of grub problem. 0.5 to 1.5 inch long C-shaped white grubs. They have 6 legs, a brown head capsule, and visible chewing mouthparts. Damage will generally only occur when some of them are at least a 0.5 inch long.



Ants

Genus Species:

Lasius Neoniger

Susceptible Turfgrass:

All Grass Types: only problematic on greens tees, and fairways.

Symptoms:

Late May to early September with peak activity in June. The adult workers make the mounds. Approximately an 1/8 inch in length. Go through numerous life cycles / generations per year. Chambers 4 to 5 feet below surface. 99% offspring are female who tend to queen, building tunnels and forage for food.



Woolly Adelgid

Genus Species:

Adelges tsugae

Susceptible Turfgrass:

Hemlock Trees

Symptoms:

The earliest visible sign of is presence of white, cottony masses, usually located on the twigs and at the bases of the needles. Populations denser in lower limbs; can be anywhere on the tree. Progress to fading, thinning and dying limbs; die off at the base of tree and move upwards. Left untreated, death of tree is certain.



Emerald Ash Borer

Genus Species:

Agrilus planipennis

Susceptible Turfgrass:

Ash Trees

Symptoms:

Canopy of infested trees begin to thin above infested portions of trunk. Destroys water & nutrient conducting tissues under bark. Heavily infested trees exhibit canopy die-back usually starting at top of tree. 1/3 to 1/2 of branches die in one year. Adult beetles leave a "D"-shaped exit hole in bark, roughly 1/8 inch in diameter.



Leaf Hopper

Genus Species:

Cicadellidae

Susceptible Turfgrass:

All plants, especially roses, potatoes, and asters

Symptoms:

Severe damage to plants by feeding on them or spreading diseases. Siphon sap from foliage. White stippling appears on leaves from chlorophyll removal. Remove nearby weeds, where eggs and nymphs overwinter.



HELPFUL TOOLS

Amount	Equal Measurements
1 kilogram	1000 grams, 2.20 lbs., 35.274 oz.
1 gram	1000 milligram, .0022 lbs., 0.03527 oz.
1 ton	2000 lbs.
1 pound	16 ounces, 453 grams, 0.453 kilograms
1 ounce	28.3495 grams, 0.283 kilograms

Amount	Equal Measurements
1 cubic yard	27 cubic feet, 0.7645 cubic meters
1 cubic foot	0.037037 cubic yards
1 acre	43,560 sq. ft., 4840 sq. yards, 0.4046 hectares
1 hectare	2.47 acres, 11959 sq. yards
1 square yard	9 square feet

PLANT & TURF GROWTH REGULATORS

Product Name	Supplier	UOM	Active Ingredient	Description / Uses	Turf Rate / 1000
Attrimec	PBI Gordon	1 Gal.	18.5% Dikegulac-sodium	Reduces pruning & trimming by 50%. Labeled for bark banding & soil drench apps, reduces fruit & flower formation.	Ornamental: Varies
Anuew	NuFarm	4 x 6 lb.	27.5% Prohexadione calcium	New AI for cool & warm season turf. MOA that can be applied to all managed turf areas. Iron not needed.	Warm: 0.67 to 1.0 oz. Cool: 0.17 to 0.67 oz.
Cutless MEC	SePro	2.5 Gal.	16% Flupridinol	Industry standard for Poa suppression. 50% fewer clippings, 50% reduction in mowing.	0.28 to 1.13 oz.
Cutless WP	SePro	30 lb.	50% Flupridinol	Industry standard for Poa suppression. 50% fewer clippings, 50% reduction in mowing.	0.09 to 0.37 oz.
Cutless G	SePro	21 lb. 40 lb.	0.33% Flupridinol	Root absorbed systemic PGR, should apply within the dripline or ornamentals.	Ornamental: Varies
Edgeless	SePro	8 oz.	13.26% Flupridinol 5% Trinexapac-ethyl	Eliminate string trimming for up to 8 weeks. Aesthetic improvement, no scalping challenges.	Varies
Embark T&O	DOW	1 lb.	3.2% Diethanolamine salt of mefluidide	Labeled for turf, groundcovers, ornamentals, and shrubs. Can be tank mixed with herbicides or fertilizers. 50% reduction.	Ornamental Varies
Legacy	SePro	2.5 Gal.	13.26% Flupridinol 5% Trinexapac-ethyl	Upgrade your PGR program and save money. Improves turfgrass quality. More uniform regulations.	0.18 to 0.51 oz.
Muskateer	SePro	2.5 Gal.	5.6% Flupridinol; 5.6% Paclobutrazol, 1.4% Trinexapac-ethyl	Triple PGR with dollar spot suppression plus complete growth reduction of perennial grass species.	0.41 to 0.82 oz.
Primo Maxx	Syngenta	1 Gal. 10 Gal.	11.3% Trinexapac-ethyl	Slows the production of gibberellic acid. Vertical shoot slowed; lateral and below-ground growth is stimulated.	0.1 to 0.2 oz.
Proxy	Bayer	2.5 Gal.	21.7% Ethephon	Type II PGR, great for taller cut height as a stand-alone product. Seedhead suppression on Poa and clover.	5 oz.
Trimmit 2SC	Syngenta	1 Gal. 2.5 Gal.	22.3% Paclobutrazol	Suppresses Poa. Inhibits gibberellic acid, promotes lateral and root growth, crowding out Poa.	0.15 to 0.74 oz.

AQUATIC HERBICIDES

AquaNeat

Controls almost 200 species of emerged weeds, including a wide range of broadleaf weeds, sedges and annual and perennial grasses, in and around flowing or stagnant fresh and estuaries or brackish water. AquaNeat gives managers the convenience to control weeds in public, agricultural, commercial or residential settings. 53% glyphosate.

Packaged Size: 2.5 gal. and 30 gal.

Reward

Provides no-wait control to a variety of aquatic weeds and is ideal for non-selective weed control in turf and landscapes as well as a trim and edge tool. It is a non-selective, highly active herbicide for control of floating, submerged and marginal aquatic weeds. Can be used along the edges and non-flooded areas of ponds, lakes, drainage ditches and canals.

Clipper

Delivers fast and selective control of tough invasive and nuisance plants such as cabomba, watermeal, Eurasian watermilfoil, water lettuce, duckweed, giant salvinia and more. Plus, Clipper dissipates quickly from the water column and does not accumulate in sediment. And, Clipper offers reduced PPE requirements with 51% WDG formulation for easier application and handling. Package Size: 1 lb. and 5 lb.

K-Tea Algaecide

Eliminates standing or slow-moving water of unsightly and troublesome planktonic and filamentous algae. Application flexibility; minimum use for broad spectrum algae control, including: Cyanophyceae (blue-green), Chlorophyceae (green), Diatomaceae (diatoms), and Protozoa (flagellates). Copper-based solution where water recreation can be used immediately after



ORGANIC PESTICIDES

Regalia PTO Fungicide

Labeled for both turf and ornamentals, derived from a plant extract of Reynoutria sachalinensis, which triggers the plants' natural defense systems to combat FUNGAL and BACTERIAL diseases. Regalia PTO has a novel mode of action to offset resistance and maximize plant health and yield potential. Tank Mix with standard fungicides and dramatically reduce rates. Labeled for: Dollar Spot, Anthracnose, Brown Patch, Red Thread, Fusarium Patch, Yellow Patch, Leaf Spot, Bermudagrass Decline, and Pythium.



DiPel Pro Insecticide

OMRI certified and considered the leading biological insecticide on the market. Registered for use on a variety of ornamentals, delivers outstanding control of more than 30 species of insects, including tent caterpillar and various bagworms, looper, tobacco budworms and armyworms. Its dry flowable formulation is dust free and easy to measure and mix. DiPel PRO DF is biodegradable and has minimal effect on humans, non-target animals or the environment.



Finalsan Non-Selective

OMRI-listed and organic certified. Non-selective, ammoniated soap of fatty acids, penetrates the wax layer (cuticle, bloom) of the leaf. The lipophile portion of the fatty acid ultimately destroys the plant's epidermis cell membranes. This causes a fast release of cell material and the plant dries up quickly. Controls grass, weeds, moss, and algae. Works in cool weather. Kills within one hour. Will synergize conventional herbicides.



Grandevo Insecticide

Active ingredient Achromocil is a broad-spectrum insecticide. Controls chewing and sucking insects through three actions - oral toxicity, repellency, and reduced reproduction. Carries very little risk of insects developing resistance and should be a component in both Integrated Resistance Management (IRM) and Integrated pest Management (IPM) plans. In addition, Grandevo PTO is NOT harmful to beneficial insects or honeybees! Controls chinch bugs, sod webworms, cut worms, white grub, and other turf pests.



Defiant Fungicide

A dry, flowable 75% Thiram formulation. It is ideal for the prevention of Dollar Spot, Brown Patch and Fusarium Patch in the summer season and Pink Snow Mold in the winter. In addition, Defiant provides protection to ornamentals from damage caused by deer, rabbits, rodents and migratory birds. Great tank mix partner with Sterol Inhibitors (SI) chemistry to increase the spectrum of activity and reduce resistance potential.



Agra-Rouse

A multi-purpose biological, designed as a plant growth regulator for turf and ornamentals. Benefits include but are not limited to: increased yield or color, enhanced nutrient uptake and utilization, improved flower retention, stress resistance, increased vigor, improves salinity tolerance. Reduce rates of standard fungicides when mixed in same spray. Increases root mass by stimulating the horizontal and vertical growth. EPA registered biostimulant, assuring each jug contains the exact same AI.



Fiesta Weed Killer

Controls a variety of broad leaf weeds, moss, and algae. Designed for use on parks, playgrounds, golf courses, schools, and areas with pesticide bans/concerns. Works in cool weather. Visible results in less than 24 hours. No odor. Turf can be re-seeded after 24 hours. Use on lawns seven days after emergence. Safe for re-entry immediately after spray dries. Rain-fast in three hours. Synergizes with traditional herbicides. Controls / Suppresses common weeds such as: Algae, plantain, chickweed, ground ivy, dandelion, Moss, Oxalis, clover, and more.



Rhapsody Fungicide

Preventative biofungicide, reduces the risk of fungicide resistance given it has multiple modes-of-action that are unique. It uses bacillus subtilis strain QST 713 to aid disease control with synthetic fungicides while also promoting plant health. This natural active ingredient is OMRI Listed. Tank mix with standard pesticides and drastically reduce their rates. Controls pathogen spores or weakens them for greater susceptibility to synthetic fungicides. Contact activity limits resistance build-up of moderate-risk to high-risk fungicides.



IronFist Slug & Snail

Slug and snails ingest the bait, causing them to stop feeding and die. Immediate plant protection will be observed through the decrease in feeding. Land snails and slugs are pests that can be found in landscapes and greenhouses. Damage can be extreme as they feed directly on foliage. Snails and slugs may be difficult to detect because they are primarily active at night. Use IronFist around shrubs, flowers, trees, lawns, gardens, turf, and greenhouses.





Hydra-Shield Pigment

Hydra-Shield is a premium pigment additive. Tested and marketed for 4 years against the industry standards, Hydra-Shield out performed in both color and longevity. Provides a dark green color, instead of the traditional blue color from many industry competitors. Highest concentration pigment on market and less abrasive on pumps.

Rates: Greens: 12-24 oz. per acre. Fairways: 18-32 oz. per acre.
Sports Turf: 24-34 oz. per acre.

Hydra-Shield Paint:

Hydra-Shield Paint is a deep dark green paint. Perfect replacement for perennial ryegrass grown in warm season turf. Used in the south east for years, Hydra-Pigment Paint has been a 'go-to' for resort courses remaining 'elite' during the cooler seasons.

Use Rates: Mix 1 gallon of Hydra-Shield Paint with 15 gallons of water to cover approximately 10,000 square feet.

Hydra-SPI Blue HC

Hydra-SPI Blue HC is a highly concentrated blue liquid spray pattern indicator aiding in elimination of skips and overlaps (waste), while reducing drift. Provides high visible evidence of where a spray application has been made.

Use Rates: 3 – 4 ounces per 50 gallons

Hydra-SPI Blue

Hydra-SPI Blue is a blue liquid spray pattern indicator aiding in the elimination of skips and overlaps (waste), while reducing drift. Provides high visible evidence of where a spray application has been made.

Use Rates: 12 – 16 ounces per 50 gallons.

Hydra-SPI Green

Hydra-SPI Green is green liquid spray pattern indicator aiding in elimination of skips and overlaps (waste), while reducing drift. Provides high visible evidence of where a spray application has been made.

Use Rates: 12 – 16 ounces per 50 gallons.

Reflector Pond Dye WSB

Reflector is a highly concentrated black dye formulation that imparts a black, reflective-mirror look. It is a blend of environmentally friendly, nontoxic black dyes that reduces sunlight penetration. Easy to use. Harmless to fish and wildlife. Do not apply to water that may be used for human consumption and do not apply to streams, rivers or bodies of water not controlled by the user.

Use Rates: 1 to 2 water-soluble bags treats 1 surface acre of H2O up to 6' deep. For a more dramatic appearance add more bags after waiting 12 - 24 hours.

Superior Blue Pond Dye WSB:

Superior Blue is a highly concentrated blue dye formulation that safely imparts a blue hue for significantly enhanced aesthetics of ponds and water features. Long-lasting natural blue color. Easy to use. Harmless to fish and wildlife. Do not apply to water that may be used for human consumption and do not apply to streams, rivers or bodies of water not controlled by the user.

Use Rates: 3 to 4 water-soluble bags treats 1 surface acre of H2O up to 6' deep. For a more dramatic appearance add more bags after waiting 12 - 24 hours.

Superior Blue Pond Dye WSB:

Superior Blue is a highly concentrated blue dye formulation that safely imparts a blue hue for significantly enhanced aesthetics of ponds and water features. Long lasting natural blue color. Easy to use. Harmless to fish and wildlife. Formulated to filter sunlight penetration needed for photosynthesis.

Use Rates: 1 to 2 quarts treats 1 surface acre of H2O up to 4' deep.

Endurant Premium Paint

Eye-popping, lively green colorant bringing event the thickest lawns and taller grasses to life with a deep green ultra-concentration of the Original blend of organic pigments. This ensures the color remains full and rich, providing a natural looking green that is consistent and long-lasting. Its visual appeal is unmatched by any other brand on the market. The elimination of the significant cost associated with overseeding has made painting dormant warm season grasses a more viable option than ever before. The reduction of chemical use, a decrease in watering, and the promise of fewer transition related problems have combined to make this management strategy increasing appealing for both financial and agronomic reasons.

Endurant T/E (Turf Enhancer)

A springtime green intended for use during the seasonal transition as the approaching dormancy conditions occur, providing a natural-looking green associated with actively growing healthy turf. Its visual appeal is unmatched by any other colorant, staying consistent with the superior colors, quality and value associated with the Endurant Turf Colorants.

Rate: 8 - 24 oz. / acre

SOIL AMENDMENTS



Hydra-G Calcium

Powered by HydraSmart technologies, this High Efficiency Calcitic Lime contains humic, fulvic, and carboxylic acid. The only technology containing multi-microbial nutrient sources, 300x micro grind and 8% binder to build the soluble calcium back to a uniform prill. All solutions in the Hydra-G High Efficiency Calcitic Lime are scientifically designed to work faster and more efficiently than any other high efficient solution on the market. Hydra-G High Efficiency Lime specifically and dramatically reduces manpower and transport costs. Raises soil pH in weeks rather than months.

Hydra-G Gypsum

Packed with 21% calcium and 16% sulfur, this High Efficiency Gypsum is powered by HydraSmart technologies, containing humic, fulvic, and carboxylic acid. The only technology containing multi-microbial nutrient sources, 300x micro grind and 8% binder to build the soluble calcium back to a uniform prill. High Efficiency Gypsum is perfect for reducing bicarbonates and salts from the colloid and soil, increasing water penetration through compacted soils, and aerating high CEC soils. All solutions in the HydraSmart-G portfolio are scientifically developed to work faster and more efficiently than any other high efficient solution on the market.

Hydra-G 6-0-6

Driven by HydraSmart technologies, Hydra-G 6-0-6 with Minors is packed with 6% calcium, 5% iron, 6% magnesium 13% sulfur, humic, fulvic, and carboxylic acid. Hydra-G 6-0-6 is the only technology on the market containing a multi-microbial nutrient source, a limestone grind of 45 microns, and 8% binder to build the soluble calcium back to a uniform prill. Both the 5% iron and 6% magnesium are derived from the trusted sources of Hydra-Fe combo and Hydra-Mn combo, two product solutions that have become regular staples on the foliar spray market. Hydra-G 6-0-6 with minors will provide unsurpassed, long-lasting color, while continuously feeding the soil biology at the same time.

Hydra-G 6-0-6

Driven by HydraSmart technologies, Hydra-G 6-0-6 with Minors is packed with 6% calcium, 5% iron, 6% magnesium 13% sulfur, humic, fulvic, and carboxylic acid. Hydra-G 6-0-6 is the only technology on the market containing a multi-microbial nutrient source, a limestone grind of 45 microns, and 8% binder to build the soluble calcium back to a uniform prill. Both the 5% iron and 6% magnesium are derived from the trusted sources of Hydra-Fe combo and Hydra-Mn combo, two product solutions that have become regular staples on the foliar spray market. Hydra-G 6-0-6 with minors will provide unsurpassed, long-lasting color, while continuously feeding the soil biology at the same time.



K-Cal Plus 0-0-22

All the benefits of High Efficiency Gypsum plus 22% soluble potassium, K-Cal Plus is a tremendous soil amendment to add during aerification or topdressing high traffic turf. Impregnated with humic, fulvic and carboxylic acids, K-Cal Plus contains 14% calcium, 21.2% sulfur, and 3% magnesium. Also recommended for use shortly after seed germination to strengthen plant during stress periods.

Ecolite

Takes soil amending to the next level. Not only does this zeolite mineral have the highest CEC of all physical soil amendments, it holds and releases potassium and ammonium, retains water and creates porosity resulting in enhanced growing conditions. The specific particle size makes Ecolite the ideal soil amendment when aerifying or for construction. Helps build porosity in tight soils..

Rates:

Aerification: 50 to 100 lbs. / 1000 sq. ft. .

Light Top Dressing: 10 to 25 lbs. / 1000 sq. ft.

Renovate Plus Recovery

50/50 combination of EarthWorks Renovate and Eco-Lite and is a powerful amendment that will open tight soils, speed turf recovery, and stimulate soil biology without a big nitrogen push. This combination allows for oxygen movement through the soil and promotes an active microbial generated nitrogen cycle. Contains: Ecolite, Kelp Meal, Greensand, Compost, Hard & Soft Rock phosphate, Humic & Fulvic Acid, and Sulpo-Mag.

Rates:

Aerification or top-dressing: 25 - 50 lbs. per 1000 sq. ft.

Myco-Replenish 3-3-3 w/Mycorrhizae

Combines the high quality of Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. Ideal for any landscape planting situation, establishment of grass seed or sod and will enhance all soil aerification practices. An extensive amount of Mycorrhizae fungi in combination with Replenish compost fertilizer will promote extensive root growth, reduce heat and drought stress, improves water and nutrient uptake and can eliminate transplant shock.

Rates:

Aerification: 10 to 15 lbs. per 1000 sq. ft.

Sod: 10 lbs. per 1000 sq. ft.

Seed: 15 lbs. per 1000 sq. ft.

Shrubs: 1 gal container: 1/4 lb.; 5 gal container: 1 lb.

SOIL AMENDMENTS



Quick Dry

Save the game from rain. The fine particles of Turface® Quick Dry® make it the perfect choice for quickly clearing up puddles and mud on skinned infields. Just dump and rake to make your infield safe and playable. Absorbs its weight in water! Won't harden or cake like similar water-absorbing products. Package Size: 50 lb.



Trackpro

TrackPro™ Warning Track Aggregates are consistently sized, specially blended aggregate particles for safety and performance. Available in several particle sizes and color choices, it's designed for: Aesthetically pleasing appearance, Superior drainage, Firm surface without compaction, Stable footing for, enhanced playability, Any pathway with high foot traffic. Available Colors include: Crimson, Red, and Gold Package Size: 1 Ton and Bulk



Sand + Peat

Used for topdressing mixes, putting greens, flower beds, sports fields, tee boxes and construction mixes Sand + Peat blends are available in the following mixes:

70% Sand + 30% Peat

90% Sand + 10% Peat

85% Sand + 15% Peat

80% Sand + 20% Peat

Package Size: Bulk Delivery.



CSD-35 Greens Mix

CSD-35 Greens mix sand is a USGA spec sand that is consistently sized and can be blended with peat for greens and tee box construction. It is also used on athletic fields and playgrounds. Because of its permeability, it is an excellent growing medium when mixed with peat, fertilizer and other additives.

Package Size: Bulk Delivery



CSD-35 Bunker Sand

CSD-35B Bunker sand meets USGA guidelines for selecting bunker sand, this sand is a white excellent bunker sand with a very low tendency to fried-egg lies. This sand is outstanding in the seven guidelines the USGA recommends for selecting bunker sand.

Package Size: Bulk Delivery



CSD-35 Greens Mix

A unique blend of TD-320 Top Dressing Sand, USGA guidelines, the silica sand is washed, dried, sized, and then colored green and bagged. Designed for repairing divot marks on tee-boxes and on fairways. It can also be used as a top dressing mix for putting greens and soil conditioners for tree, shrubs, and flowerbeds.

Package Size: Bulk Delivery and 50 lb. bags



Top Dressing Sand

Produced from 98% pure silica sand, which is angular in shape. It is washed and sized to meet USGA guidelines for topdressing material. Inventory is maintained on all four grades for immediate shipment:

CSD-65 Ultra Dwarf Sand

#35 Topdressing Sand #45 Topdressing Sand

#55 Topdressing Sand

Package Size: Bulk Delivery and 50 lb. bagsy



The Award Winning Line Marking System

High quality and innovative line marking products which allow you to mark sports fields with ease!

[Get a free demo - Contact us](#)

Raising the standard in line marking



No more mess

Impact paint is ready to use paint – no more mixing, no more pouring and no more mess.



It's easier

The iGO is designed by and for grounds staff and is easy to setup, operate and clean after use.



Save money

With the iGO and the Impact XP you can over-mark a standard football (soccer) field with as little as 1.6 litre (0.42 gallons) of paint. The price per pitch has never been lower.



Be good to the environment

The paint is 100% biodegradable and used in the iGO, water and energy is saved.



iGO Line Marking Machines



iGO Deluxe

- Easy to set-up, operate and clean
- Fully Charged battery secure's 4-5 hours of constant spraying
- Charge battery after each use - the battery turns automatically off when fully charged
- For easy cleaning and maintenance it comes with two filters
- Probe filter kill non-return valve
- Carries 2 x 10 liters (2.64 gallons) of canisters
- Comes with a variety of nozzles, a screen, a quick release and a sample of Flush Thru
- Lightweight and easy-to-push
- Comes with two buckets to carry water



iGO Standard

- Easy to set-up, operate and clean
- Fully Charged battery secure's 4-5 hours of constant spraying
- Charge battery after each use - the battery turns automatically off when fully charged
- For easy cleaning and maintenance it comes with two filters
- Probe filter kill non-return valve
- Carries 2 x 10 liters (2.64 gallons) of canisters
- Comes with a variety of nozzles, a screen, a quick release and a sample of Flush Thru
- Lightweight and easy-to-push
- Comes with two buckets to carry water



iGO Mini

- Easy to set-up, operate and clean
- Used with exclusive 5 liters (1.32 gallons) container
- Easily folded for transport / storage
- For easy cleaning and maintenance it comes with two filters
- Comes with a variety of nozzles, a screen, a quick release and a sample of Flush Thru
- Lightweight and easy-to-push
- Comes with two buckets to carry water

Accessories



Side Arm



Spray Lance, Stainless Steel



Spray Boom



Spray Lance



Athletics Boom

Impact Paint



Impact Paint

Excellent line marking paint that wins on all parameters. Period.

Main features:

Economical, bright, white and long lasting

Pack size:

5 and 10 liters (1.32 and 2.64 gallons) of canister

Application:

Spray

Area of use:

Natural grass

Colors:



Impact XP Paint

Excellent line marking paint. White, bright and long lasting. Used by top sports clubs around the world.

Main features:

Very bright, very white and longer lasting

Pack size:

5 and 10 liters (1.32 and 2.64 gallons) canisters and 5 liter (1.32 gallons) of eco-bag

Application:

Spray

Area of use:

Natural grass



SPORTS TURF SOIL AMENDMENTS



Pro League

More groundskeepers rely on Turface® Pro League® than any other infield conditioner for one fundamental reason – to give players the opportunity to perform at their best. Moisture-absorbing properties improve footing and help to prevent rainouts. Smaller, more uniform particles assure a smooth, professional, skinned playing surface, minimizing potentially dangerous bad hops. Color choices enhance visibility and ballpark aesthetics. Available colors include: Heritage Red, Champion Brown, Red, and Natural.

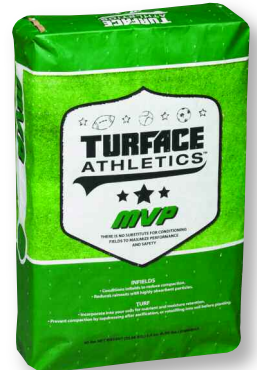
Package Size: 50 lb., 1 Ton, and Bulk



MVP

No other conditioner has been used on more diamonds than Turface® MVP®. Its larger particle size is excellent for incorporating into infield mix, topdressing to create a consistent and level playing surface, helping prevent rain outs, and improving native soil for turf renovations. Maintain a smooth, cushioned, playable surface for superior traction and playersafety. Absorb excess moisture and improve drainage as a result of balanced air and water pore space. Available Color: Natural.

Package Size: 50 lb., 1 Ton, and Bulk



Mound Clay Bags

The newest solution from Turface, Mound & Plate All-Purpose Clay outperforms other products in its class: Sand/clay mixture is an affordable, easy-to-use alternative packing clay. Excellent additive to soft, sandy areas of the infield to firm them up for safer footing and consistent ball

hops. Gumbo Gray possesses a high level of tackiness; enhances its bonding strength. Red is durable and possesses a high level of plasticity; molds together easily. 100%, high-density pure virgin clay delivers long-lasting performance. Package Size: 50 lb.



Moundmaster Blocks

100% pure virgin clay blocks deliver long- lasting performance. Blocks are sized perfectly for building boxes and the mound from the ground up. Packaged as 8 block sets in water tight bags to retain proper moisture. Pliable construction makes it easy to mold into just the right form. Finely shredded, 100% pure virgin, high-quality clay composition. Great for shaping the mound and routine maintenance. High density for increased durability. Blocks are 2 1/2" x 4" x 8"

Package Size: 1 pallet



Field & Fairway

The perfect choice for conditioning native soil sports turf, ideal for heavy traffic areas near goals on Soccer fields. Its uniform particle size makes it perfect for new field construction, topdressing and infilling aerated fields. It is available in natural and emerald green to blend in with the color of sports turf. Its performance is proven in University testing and in the real world by groundskeepers like Ken Mrock of the Chicago Bears. Holds air, water and nutrients at the root zone. Reduces compaction and improves water drainage.

Package Size: 50 lb., 1 ton, and Bulk



Profile Greens Grade

The perfect choice for conditioning sand-based sports turf. Its uniform particle size makes it ideal for new field construction, topdressing and infilling aerated fields. It is available in natural and emerald green to blend in with color of sports turf. Holds air, water and nutrients at the root zone. Retains moisture better than sand alone. Drains better than sand and sand/peat blends. Proven in trials to speed recovery of sports turf after game day simulations.

Package Size: 50 lb., 1 Ton, and Bulk



Quit treating your soil like dirt.

1+1=10,000

aquaMaxx
POWERED BY **groSMART**

Treats
10,000 sq. ft.

- **groSMART Technologies**
 - Soluble N-P-K
 - Surfactants hold water
 - Organic Nutrition
 - Disease Protection
 - Mycorrhizae
- **A-List Approved**
 - ✓ Sustainable
 - ✓ Less Inputs
 - ✓ Less Water



aquaMAXX is powered by the newest generation of **groSMART** technologies and is scientifically designed for rapid establishment and long-lasting color and growth. Contains a patented blend of surfactants that dramatically increases the water holding capacity of seed, along with a proprietary blend of proteins, mycorrhizae, nitrogen, phosphorous, and potassium.

EarthWorks
NATURAL ORGANIC PRODUCTS

Myco-Replenish

• Replace Synthetic Starter Fertilizer

- Endo and Ecto Mycorrhizae
- Holds H₂O where seed needs it
- Increase nutrient uptake
- Releases locked up phosphorous and magnesium
- Full load of carbon based fertility
- Full load of humic acids



Treats
10,000 sq. ft.



Myco-Replenish combines the high quality of EarthWorks Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. The extensive amount of Mycorrhizae fungi will help to promote extensive root growth, reduce heat and drought stress, improves water and nutrient uptake and can eliminate transplant shock.

PREMIUM GRASS SEED

aquaMAXX TF

Less Water, Less Inputs, More Sustainable, aquaMAXX is the most unique, revolutionary tall fescue blend on the market. Powered by groSMART and complemented by A-List, it is designed to establish quicker, stronger and more vigorous. Pretreated with patented organic and synthetic nutritionals on each seed, contains more than 35 different sources of food for both the seed and soil. Add these chemistries to A-List seeds and it's been proven fertilizer apps can be reduced during seeding and even shortly after.



groSMART Technologies

The only pre-treated seed technology in the industry containing a patented blend of surfactants that dramatically increases H₂O holding capacity, a proprietary blend of proteins, natural growth promoting agents, nitrogen, phosphorous, potassium, and a full micro-nutrient package. Consists of a unique form of humic acids and microbes that feed soil and maintain moisture throughout the soil profile. Rapid establishment and long-lasting growth.

POWERED BY **groSMART**

A-List Approved

Is your seed A-List certified? An Independent, non profit, industry initiative, fostering development of sustainable turfgrass varieties and related products that perform their function with less maintenance inputs, thus benefiting the environment. A-LIST monitors a voluntary evaluation program including metrics like water conservation, reduced fertility, traffic, heat, and drought stress tolerances, all with no fungicide or insecticide applications. Varieties have unique traits, much like a fingerprint, which that allow them to be compared and evaluated on a standard basis.



Southern Lawn TF

Trusted for over 40 years, Southern Lawn is the flagship TF seed variety used by top professionals throughout the Mid-Atlantic. Specifically designed and constantly evolving based on improved varieties, SLB is guaranteed to consist of three TF's highly ranked on the NTEP reports, University recommended for drought, heat, stress, and traffic tolerance. Perfect use for roughs, lawns, grounds and municipalities. Will produce a dark green color and each year varieties are carefully chosen to guarantee a confidence in performance.



Field General PR

Proven to be one of the most gray-leaf spot resistant perennial ryegrass brands, both warm-season and cool-season turf managers have trusted Field General on their fairways and sports fields for over 30 years. Specifically designed to be versatile, sturdy turf suited for high wear and high use irrigated areas. Field General is blue-tag certified and on many University recommended lists. Dark in color, gives athletic turf and golf courses a great playing service, while being able to mow at lower condition.



Dress Blues KB

Designed to be a versatile, sturdy turf suited for sod production, golf course fairways, athletic fields, and highly manicured lawns. KBG is the only spreading cool season grass that will tolerate the traffic on low cutting height involved in athletic turf. Kentucky Bluegrass is slow to establish, but once established has an amazing recuperative potential. University recommended. Ideal to mix with Field General or Brigadier perennial ryegrass for athletic turf. Can be mixed with Southern Lawn for a darker textured high cut area.



Southern Lawn Xtreme

90% industry trusted SLB TF + 10% Heat Tolerant Bluegrass, exceeds the need for high performance grass that can stand up against heat, traffic disease, and other challenges in 'Transition Zone.' Heat Tolerant Blues are proven to have far more tolerance against diseases like Brown Patch. An alternative to straight TF blends, can be used at lower rates and in many cases be more economical per 1000 sq.ft. Aggressive rhizomes fill in patches far quicker than standard TF blends.



Southern Shade

Designed to be a versatile solution for shady areas, will perform well in moderate to heavy shade, strong drought tolerance and insect and disease resistance. Use a low nitrogen fertility program with Southern Shade, and try to limit traffic as much as possible. Great mixture to achieve a more native scenery, comprised of fine fescues that perform better under difficult soil conditions. Can also be used on slopes to prevent erosion problems. Fines have a very strong root structure.



PREMIUM GRASS SEED

Rescue

80% TTF and 20% PR. Contains three top performing Tall Fescue varieties + two perennial ryegrass varieties. Benefits of a standard contractors mix because of fast germination, yet the lasting results of a true turfgrass. Uses include, but are not limited to: home lawns, athletic fields, or commercial turf. A visually appealing alternative to contractors mix, it can also be used in areas where erosion is an issue.



Southern Lawn Maxx TF

Proven to need less water and fertilizer during application, SLB Maxx will still bring more color and longer roots. Complimented by the trusted Southern Lawn brand, Maxx is pre-treated with some of the groSMART technologies, allowing for top-tier results. SLB Maxx is guaranteed to consist of three TF's highly ranked on the NTEP reports, University recommended for drought, heat, stress, and traffic tolerance.



soilDEFENDER

Scientifically designed for erosion and sediment control where quick and lasting vegetation is a necessity. Powered by groSMART technologies, Soil Defender is the only erosion control vegetation bmp that offers a pretreatment of over 35 biological and synthetic nutritional food sources. Available in both a warm-season and cool-season blend, Soil Defender uses white-clover for the free nitrogen fixation, redtop bentgrass for rhizomatous features, stoloniferous legumes to hold soil in place.



Bentgrasses

Always up-to-date on the latest technologies, you can trust that Landscape Supply, Inc. can access the following bentgrasses, but not limited to: Tyee, 007, Penn-A series, Declaration, Independence, Penlinks series, Penncross, MacKenzie, L-93, Barracuda, Luminary, Crystal Blue Links, Penn-G series, Pure Distinction, Seaside II, PennTrio, Penneagle, Nu-Penn, Memorial, Center-Cut, 13M, Shark, Alpha Bentgrass, L-93 Alpha, T-1, Universal Blend; V-8.



Warm Season Grasses

Always up-to-date on the latest technologies, you can trust that Landscape Supply, Inc. can access the following bentgrasses, but not limited to: Riviera (stock), Professionals Choice (stock), Black Jack, Jubilee, Yukon, Futura Heat, Compadre.



Wild Flowers & Natives

Classic mixture of up to 30 species of annual and perennial wildflowers, provides a broad range of colors, blooming times, and mature plant heights. This utility mixture is ideal for ornamental accents, concealing unsightly undeveloped areas, slopes, and naturalized areas.



Brigadier

Specifically designed to be versatile, sturdy perennial ryegrass for overseeded warm-season grasses. Brigadier is a combination of the industry's top performing 3-way blend of Field General and 10% transitional ryegrass. Transitional ryegrasses are a genetical hybrid / crossover of annual ryegrass and persistent perennial ryegrasses. Brigadier is a cost-effective alternative to traditional perennial ryegrass blends, also transitions out more naturally saving on chemical and labor costs.



Sports Blend KB + PR

70% comprised of Field General top quality perennial rye + 30% trusted Dress Blues. All varieties of bluegrass and ryegrass are University approved, blue tag certified. Because of its tough characteristics, persistence during summer stress, and it's darker green color, Sports Blend has become one of the most trusted blends in the transition zone. Low mow, heat tolerant, dollar spot and brown patch resistance. 50 / 50 by seed count bag similar to all others



A Plus TTF Blend 90/10

This high-quality turf-type tall fescue blend with Kentucky Bluegrass performs exceptionally in the Transition Zone. It includes 10% heat tolerant bluegrass that stands up to heat, traffic, disease and other challenges in the Transition Zone. This is a great choice for home and commercial landscapes, parks and low-maintenance areas. Ideally suited for golf and sod farms as well.

A Plus

Scottish Links Mixture

Consists of low-growing fine fescues well adapted to the harsh conditions of golf course roughs and bunker faces. Left unmown, this formula provides maintenance savings, erosion control, and adaptation under varying soil conditions. It is tolerant of shade, low fertility, and reduced irrigation in parks, home lawns, golf course roughs, roadsides, and utility turf.



PREMIUM GRASS SEED

Vitality Tall Fescue Blend

Turf Type Tall Fescue Blend offers proven performance against drought, heat, diseases, and pests in the Mid-Atlantic Region. If you need tough, durable turf in full sun and partial shade conditions this is the blend for you. Vitality Tall Fescue Blend goes above and beyond by selecting varieties of tall fescue that perform best in the Mid-Atlantic Region. Using the same University trials and certification standards that sod farmers rely on, Vitality Tall Fescue is literally the best retail seed money can buy. University of Maryland and Virginia Tech select the best varieties of tall fescue for our area, and we put them in this bag. The Maryland Department of Agriculture then supervises the mixing and bagging operation to ensure the certified varieties are being used at the proper percentages. Germinates in 5 - 14 days. MD/VA Interagency Certified.

Rates for seeding new lawns: 9 lb. per 1000 sq. ft.

Rates for over-seeding: 6 lb. per 1000 sq. ft.



Vitality Shade Mate Mixture

Shade Mate Mixture is perfectly designed to flourish in heavily shaded areas where other grasses decline, especially around and under trees. This mix produces a low-maintenance dark green, fine-textured lawn while reducing your fertilizer inputs and mowing frequency by 1/3. Contains a mixture of 90% Fine Fescues, 5% Kentucky Bluegrass, and 5% Perennial Ryegrass and tolerates low ph. This is a true shade mixture. No filler or cheap full sun species to lower cost. Get what you pay for and start growing grass where you never have before. Germinates in 7 - 21 days.

Rates for seeding new lawns: 5 lbs. per 1000 sq ft

Rates for over-seeding: 3 lbs. per 1000 sq ft



Vitality Quick-2-Gro Mixture

If you need grass quick, our Quick-2-Gro is the one you need. It works great in both sunny and moderately shady areas and can germinate within a week. The same mixture that professional contractors use throughout our region to stabilize soil quickly and prevent soil erosion, Vitality Quick-2-Gro is conveniently packed in small 3 lb and 10 lb bags for homeowners and your next DIY project.

Do not use Vitality Quick-2-Gro for permanent high-end lawn seeding. For best results use Vitality Tall Fescue Blend. For large quick-cover jobs, ask for Dynamic Contractor Mix in 50 lb bags. Same mixture and even more economical! Germinates in 3 - 10 days

Rates for seeding new lawns: 6 lb. per 1000 sq. ft.

Rates for over-seeding: 3 lb. per 1000 sq. ft.



Homestead Pasture Mixture

Homestead Pasture is a general-purpose mixture for non-irrigated, dryland pasture. It provides the potential for first cut hay and season-long productive pastures. Homestead Pasture Mixture is safe for horses, is highly palatable, and quick to establish. A combination of Orchardgrass, Endophyte Free Tall Fescue, Timothy, and Alfalfa makes this a perfect all-around pasture mixture for the Mid-Atlantic Region.



Green Alliance Ultra TTF Blend

This high-quality turf-type tall fescue blend performs exceptionally in the U.S. Transition Zone. It's a 3-way blend, treated with groSmart technology. groSmart is the only seed treatment containing a patent blend of surfactants that dramatically increase H₂O hold capacity, a blend of proteins, natural growth promoting agents, nitrogen, phosphorous, potassium, and a full micronutrient package. It also includes a unique form of humic acid to stimulate microbial activity. Rapid establishment and long lasting growth. A great choice for all areas requiring a superior stand of turf type fescue.



Dynamic Contractors Mixture

This mixture provides fast-establishing, professional turf varieties with a small percentage of annual ryegrass. Accomplishes fast turf coverage and permanent erosion control in lower aesthetic value turf.



Winning Colors TTF Blend

A blend of turf-type fescues bred on high performance that's formulated for the turf professional. Its 3 components are carefully selected to perform well in our area of heat and humidity. Great for sports turf and residential lawns.



Double Coverage Mixture

Double Coverage Mixture is the premium seed mixture providing an ultra-dense dark green lawn. Containing 3 top-rated Turf Type Tall Fescues and Heat Tolerant Bluegrass, this is the sod-farmer preferred seed mix for the Mid-Atlantic Region. Rapidly recovers from heat and drought stress and contains more seed per pound.

Available MD/VA Interagency Certified. Germinates in 7 - 21 days.

Rates for seeding new lawns: 7 lb. per 1000 sq. ft.

Rates for over-seeding: 4 lb. per 1000 sq. ft.



EROSION & SEDIMENT CONTROL



Tensar

NORTH
AMERICAN
GREEN

Type	Product	UOM	Description	Application Rate
Hydraulic Applied Mulch	ProGanics	50 lb. bale	Biotic Soil Media™ (BSMTM) designed as a topsoil alternative that accelerates the development of depleted soils/substrates with low organic matter, low nutrient levels and limited biological activity. Provides an abundant source of organic matter and soil building components to quickly modify soil chemistry, initiate growth establishment and buildup of the uppermost "O" and "A" soil horizons.	3,500 - 5,000 lb. / acre
	Flexterra	50 lb. bale	Replacement for rolled turf establishment blankets. Patented High Performance-Flexible Growth Medium proven to surpass all hydraulically applied mulch products and turf establishment blankets, more cost-effective per application. Bonds directly to soil. Excellent longevity. Less soil prep. Faster vegetation and greater biomass than rolled blankets.	2,500 - 3,500 lb. / acre
	ProMatrix	50 lb. bale	Patented Engineered Fiber Matrix technology, created to give an edge when bidding on jobs requiring BFM/SMM hydraulic products. ProMatrix delivers the erosion control and vegetative establishment you expect from Profile Products at a competitive price and with 20% fewer tank loads per job!	3,000 - 4,000 lbs.
	Enviroblend	50 lb. bale	Combines 100% Thermally Refined® wood fiber with the highest quality cellulose in the industry, delivering up to 15% greater yield to contractors versus competitive blend products. 70% wood fiber + 30% cellulose fiber, blended with TriFlo for better yield and less hose clogging. Covers 20% more physical ground than 100% cellulose.	1,500 - 2,000 lb. / acre
	Terra Mulch	50 lb. bale	Not just 100% cellulose, Terra-Mulch is blended with ProPlus UltraGro, a biostimulant that increases plant growth, even in the harshest conditions and poorest soils. Only cellulose solution blended with biostimulant package. Promotes seed germination and plant growth while strengthening cell wall structure.	3:1 Slope 1,500 lbs. /acre
	Jet Spray	50 lb. bag	90% faster with 50% more fiber, Jet Spray with FiberMax is a loose pourable fiber mulch is among the most sophisticated wood/cellulose hydraulic mulches on the market today. Unique fiber mulch flakes are specifically designed to pour into the smaller tank openings of jet-agitated hydraulic seeders.	2,000 - 3,000 lb. / acre
	Seed Aide	40 lb. bag	Advanced technology granular mulch made from recycled wood and cellulose fibers. Once applied to a seeded area and activated by water, the granules quickly expand and disperse to provide outstanding protection and water-holding performance right where it's needed. Applications include spot treating smaller bare spots or hydrospraying larger areas.	Varies
Erosion Blankets	Single Net Straw	4' x 135' 8' x 112'	100% straw fiber stitched with photodegradable thread to a lightweight, photodegradable polypropylene top net. Designed to provide erosion protection on moderate slopes and low-flow channels areas for up to 12 months.	4': 80 rolls / acre 8': 48 rolls / acre
	DS75	6.5' x 108'	Rapid degrading straw blanket used for low flow channels and slopes 3:1 and flatter. Degrades within 60 days due to the special additives in the photodegradable thread in top net that facilitates breakdown in sunlight.	60 rolls / acre
	Double Net Straw	4' x 135' 8' x 112'	100% straw fiber stitched with photodegradable thread to a lightweight, photodegradable polypropylene top net. The double-net construction provides greater structural integrity than single-net blankets, for use on steeper slopes and in channels with moderate water flow.	4': 80 rolls / acre 8': 48 rolls / acre
Additives	NeutraLime Dry	40 lb.	Choose NeutraLime™ Dry for soil pH values less than 6.3. One 40-pound bag contains 50% more calcium carbonate (CaCO ₃) than the highest concentrated 2.5-gallon jug of liquid lime. Improves soil pH within 3 to 7 days after application. Maximum effectiveness up to 18 weeks.	40 - 400 lb. / acre
	Jumpstart	Gallon	A proprietary liquid formulation containing a soil penetration agent, humic acid and over 200 species of beneficial soil bacteria. Improves moisture infiltration and retention. Faster nutrient uptake.	1.25 - 5.0 gal. / acre
	Embella	2.5 Gal.	Blend of a biodegradable sequestering agent, proteins, and natural growth promoting substances. Makes nutrients tied up in the soil more available and helps detoxify the soil. KaPre® Embella provides nutrition for native microbial populations as well as those added to the environment. Increases the water holding capacity of the soil, which decreases watering requirements.	16 - 32 oz. / acre
	Tacking Agent 3	4 x 8 lb.	Proven to reduce soil erosion and water runoff immediately after hydroseeding – no cure time is required, Tacking Agent 3 contains the flocculant, polyacrylamide and hydro-colloid polymers for enhanced fiber-to-soil bond as well as a marker dye to enhance visual metering.	1 lb. / 100 gallons
	Myco 3-3-3	50 lb.	Combines the high quality of Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. Loaded with humic acid to provide fasted seed establishment. Alternative to starter fertilizer.	250 - 400 lbs. / acre
	Tornado Tack	50 lb.	Delivers the strongest, environmentally safe bond available. With its high-loading formulation, Tornado Tack ST-1000 delivers twice the coverage of conventional blended mulch.	500 lb.

TOOLS & LANDSCAPE INSTALLATION

Field King 4 Gal. Sprayer

Features exclusive "No Leak" internal pump - will never. High pressure piston pump sprays up to 150 PSI. Low pressure regulator included to spray at 25 PSI. Viton gaskets and seals provide maximum chemical resistance. 4 Nozzle System; brass adjustable nozzle, 2 flat fan nozzles, and patented foaming nozzle. Fold away pump handle for easy storage. Accepts TeeJet nozzles. Built in carry handle.



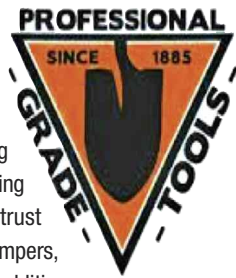
Tree Guying

Specifically designed to replace traditional methods such as wire or hose. Safe, soft, easy to use and less expensive than traditional tree ties. Eliminates the need to flag or cover guywires by expanding as the tree grows in caliper, preventing girdling. Stands up to fierce winds while providing enough sway to help the tree develop trunk strength. Available in multiple lengths and widths.



Landscape Installation Tools

Each Landscape Supply, Inc. service center is well stocked to be your one-stop shop for landscape installation tools. Forks and rakes. Spades, Hoes, cultivators, and weeders. Planting tools, shovels, snow shovels, Pruning knives, striking tools, pitch forks. For your athletic field use, trust Landscape Supply, Inc. to always have stripers, tampers, and other installation or maintenance tools. In addition, a full line of safety protection tools including, but not limited to: gloves, respirators, tyvek chemical spray suits, and more.



Anderson Push Spreaders

Highest quality professional rotary spreader, Anderson model 2000's are the most trusted by turf professionals that require top quality consistency and accuracy on their spread applications. Number one used rotary spreader in the golf industry. Patented helical cone-adjust spread pattern for better accuracy. Heavy duty stainless steel frame for long life. Pneumatic tires. Right side deflector shield and hopper cover included.



Available Spreaders:

2000-SR: Stainless steel frame

2000: : Painted steel frame

SSD Anderson's Drop Spreader

Highest quality professional drop spreader available on the market today. The SSD is the accumulation of proven performance and will provide you years of trouble-free service. High quality stainless steel hopper. Heavy duty enamel finished frame for long life 13" Turf Saver pneumatic tires. Precision calibration, provides the most effective and accurate way to spread small particle seed and fertilizer. Includes a one-year warranty.



Earthway Spreaders

EarthWay® designs, engineers, and manufactures high quality lawn and garden professional spreaders used by the most recognized names in the fertilizer, seed, and lawn and garden industries. The EV-N-SPRED® brand goes through several quality-control reviews before being placed into carton.

Available Spreaders:

C24HD 100 lb.: Painted steel frame.

2150 50 lb.: Painted steel frame.

C24HD-S 100 lb.: Stainless steel frame.

22HD-S 50 lb.: Stainless steel frame.

Chest Spreader: 25 lb.



Treegator

A slow release watering system for new trees, delivering a high volume of water directly to the root system of a newly planted tree with no run-off or evaporation. Save you time, money and effort, all while properly and efficiently watering your new trees. Ideal for new shade or street trees.

Available Sizes: 20 Gallon and 14 Gallon.



Landscape Edging

Aluminum Edging: Recycled an infinite amount of times without any loss of product during the recycling process. Lightweight; will never rust, extremely flexible; shaped into a multitude of designs. Multiple sizes available.

Steel Edging: Durable, rigid, and lasts longer than many other edgings. Each 10-foot section of edging has a thickness of 12 gauge and is 4 inches wide. The 12-inch tapered stakes are 10 gauge steel. Multiple sizes available.



WEIGHTS & MEASURES

Helpful Measurements & Conversions

WHAT DO THE ABBREVIATIONS STAND FOR?

FORMULATIONS

AS	=	Aqueous Suspension
D	=	Dust
E or EC	=	Emulsifiable Concentrate
F	=	Flowable
G	=	Granules or Granular
L	=	Liquid
MTF	=	Multiple Temperature Formulation
SP	=	Soluble Powder
Wor WP	=	Wettable Powder
WD	=	Wettable Dust
SL	=	Soluble Liquid
WDL	=	Water Dispersible Liquid
WDG	=	Water Dispersible Granule
LC	=	Liquid Concentrate

METRIC CONVERSION

LENGTH

Inch x 2.54	=	Centimeters
Foot x 0.3	=	Meters
Foot x 30.5	=	Centimeters
Yard x 0.9	=	Meters
Miles x 1.6	=	Kilometers
Centimeters x 0.39	=	Inches
Meters x 3.28	=	Feet
Centimeters x 0.033	=	Feet
Meters x 1.1	=	Yards
Kilometers x 0.6	=	Miles

WEIGHT

Dry Ounces x 28	=	Grams
Pounds x 0.45	=	Kilograms
Grams x 0.035	=	Ounces
Kilograms x 2.2	=	Pounds
U.S. Ton (2000 lbs.) x 0.907	=	Metric Ton
Metric Ton x 1.1	=	U.S. Ton

VOLUME

Ounces (Liquid) x 30	=	Milliliters
Pints x 0.44	=	Liters
Quarts x 0.95	=	Liters
Gallons x 3.78	=	Liters
Acre Inch x 103	=	Cubic Meters
Cubic Foot x 0.28	=	Hectoliter
Milliliters x 0.035	=	Ounces
Liters x 2.1	=	Pints
Liters x 1.06	=	Quarts
Liters x 0.26	=	Gallons
Cubic Meters x 0.00973	=	Acre Inches
Hectoliter x 2.8	=	Cubic Foot

AREA

Square Inches x 6.45	=	Square Centimeters
Square Yards x 0.84	=	Square Meters
Acres x 0.405	=	Hectares
Square Centimeters x 0.16	=	Square Inches
Square Meters x 1.2	=	Square Yards
Hectares x 2.471	=	Acres

METRIC CONVERSION CONT.

RATE

Pounds/Acre x 1.12	=	Kilograms/Hectare
Tons/Acre x 2.24	=	Metric Tons/Hectare
Ounces/Acre x 0.0712	=	Kilograms/Hectare
Quarts/Acre x 2.34	=	Liters/Hectare
Gallons/Acre x 9.35	=	Liters/Hectare
Kilograms/Hectare x 0.892	=	Pounds/Acre
Metric Tons/Hectare x 0.446	=	Tons/Acre
Kilograms/Hectare x 14.5	=	Ounces/Acre
Liters/Hectare x 0.428	=	Quarts/Acre
Liters/Hectare x 0.107	=	Gallons/Acre

WHAT? = WHAT?

AREA

1 Square Foot	=	144 .Sq. Inches
1 Square Yard	=	9 Square Feet
1 Square Meter	=	10.76 Square Feet
1 Acre	=	43,560 Sq.Ft. = 4,840 Sq.Yd. = 4,046.9 Sq.M.

LENGTH

1 Inch	=	2.54 Centimeters
1 Centimeter	=	0.3937 In. = 10 ML
1 Foot	=	12 In. = 30.48 CM = 0.3048 M
1 Yard	=	3 Ft. = 36 In. = 0.914 M.
1 Meter	=	39.37 In. = 3.281 Ft. = 1.09 Yd.
1 Mile	=	63,360 In. = 5,280 Ft. = 1,760 Yd.

LIQUID

1 Tablespoon	=	3 TSP = 15 ML = 0.05 Fl. Oz.
1 Fluid Ounce	=	29.6 ML. = 2 Tbsp. = 1.805 Cu. In.
1 Cup	=	* Fl. Oz. = 16 Tbsp.
1 Pint	=	2 Cups = 16 Fl. Oz. = 473 ML..
1 Quart	=	2 Pts. = 2 Cups = 32 Fl. Oz.1
1 Gallon	=	4 Qt. = 16 Cups = 8 Pt.= 128 Fl. Oz. = 3.785 Liters

RATE

feet per minute x 0.01667	=	feet per second
feet per minute x 0.01136	=	miles per hour
miles per hour x 88	=	feet per minute
miles per hour x 1.467	=	feet per second
1 Ounce per sq.ft.	=	2,720.7 lbs. per acre
1 ounce per sq.yd.	=	302.3 lbs. per acre
1 ounce per 100 sq. ft.	=	27.2 lbs. per acre
1 pound per 100 sq.ft.	=	435.6 lbs. per acre
1 pound per 1000 sq.ft.	=	42.6 lbs. per acre
1 pint per 1000 sq.ft.	=	5 gallons per acre
1 quart per 100 sq.ft.	=	2.5 gallons per 1000 sq.ft.
	=	100 gallons per acre
1 gallon per acre	=	5.8 tablespoons per 1000 sq.ft.
50 gallons per acre	=	9.2 pts. per 1000 sq.ft.
100 gallons per acre	=	2.3 gallons per 1000 sq.ft.
	=	7/8 qt. per 100 sq.ft.
100 lbs. per acre	=	2.3 lbs. per 1000 sq.ft.

WHAT IS THE AREA?

SQUARE OR RECTANGLE

Area = LW	Example:
L = Length	A = 90' x 60'
W = Width	A = 5,400 square feet

CIRCLE

Area = R ²	A = 3.14 x 20' x 20'
R = Radius	A = 1,256 square feet

CIRCLE (WITH 5% ACCURACY)

Area = 0.8 D ²	A = 0.8 x 40' x 40'
D = Diameter	A = 1,280 square feet

OVALS OR EGG SHAPED (WITH 5% ACCURACY)

Area = 0.8 LM	A = 0.8 x 80' x 40'
L = Length	A = 2,560 square feet
W = Width at mid-point	

TRIANGLE

Area = 1/2 B x H	A = 1/2 x 60' x 120'
B = Base	A = 3,600 sq.ft.
H = Height	

IRREGULAR SHAPES (WITH 5% ACCURACY)

Measure the longest axis of the area. At every 10 feet on the length line, measure the width at right angles to the length line.
Total all weights and multiply by 10.
Area = (A1B2 + B1B2 + C1C2 etc.) x 10

TRAPEZOID AREA

Area = 1/2 (A + B) H
A = One parallel side B = Second parallel side
H = Height perpendicular to the two parallel sides.
Example:
A = 1/2 (40' + 70') 40'
A = 1/2 110' x 40'
A = 2,200 square feet

HOW MUCH DOES IT WEIGH?

1 pint of water	weighs 1.04 pounds
1 gallon of water	weighs 8.34 pounds

HOW MUCH VOLUME IS IT?

2 tablespoons	=	1 fluid ounce
8 fluid ounces	=	16 tablespoons= 1 cup= 236.6 cc.= 1/2 pint
2 cups	=	32 tablespoons= 1 pint= 473.1 cc.= 16 fluid ounces
2 pints	=	64 tablespoons= 1 quart= 946.2 cc.= 0.946 liter
4 quarts	=	256 tablespoons= 1 gallon= 3785 cc.
1 gallon	=	128 fluid ounces= 231 cubic inches= 3785 cc.

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

NOTES

AGRONOMIC GLOSSARY

Absorption: In plants, the passing of a compound from one system into another such as water movement from soil into plant roots. In soils, the binding of a chemical into a soil particle.

Acclimation: Physical and physiological processes that prepare plants for temperature extremes.

Acid Injection: In irrigation systems, adding of acidic materials such as sulfur or phosphoric acid to irrigation water with excessive pH, bicarbonate, and carbonate contents. This lowers the pH and converts bicarbonate and carbonate into carbon dioxide and water.

Acidity: Acidity of a soil solution from free hydrogen ions measured as pH.

Adhesion: Molecular attraction and contact between the surfaces of two unlike substances or objects.

Adsorption: Bonding or adhering of ions or compounds to the surface of soil particles or plant parts.

Aerobic: Requiring oxygen or having oxygen present in the environment.

Aggregate: Collected together in tufts, groups, or bunches.

Alkaline Soil: Soil that has a pH above 7.0.

Alkalinity: The capacity of water to neutralize acids. A property imparted by carbonates, bicarbonates, hydroxides, and others.

Amendment: Any material such as sand, sawdust, gypsum, diatomaceous earth, peat, or calcined clay that is added to soil to alter its chemical and/or physical characteristics.

Amino Acids: Nitrogen containing organic acids that are building blocks to form proteins. Amino acids contain one or more amino (-NH₂) groups, a carboxyl group (-COOH), and possibly sulfur.

Ammonification: Conversion of amino acids and other nitrogen containing organic compounds into ammonia (NH₃) and ammonium ions (NH₄⁺).

Anaerobic: Not requiring oxygen or the absence of oxygen in the environment.

Atomic Weight: Weight of an atom of an element relative to the weight of an atom of carbon (12C), which has been assigned the value of 12.

Bacteri: Microscopic, single cell, non-green organisms with rigid cell walls that reproduce by cell division. Bacteria are prokaryotes.

Base Saturation: The degree to which the cation exchange capacity's binding or exchange sites are occupied with cations such as calcium, magnesium, sodium, and potassium as opposed to acid cations such as aluminum and hydrogen is referred to as the base saturation of a soil. Soil pH and fertility generally increase as the percentage base saturation increases.

Biodegradation: Breakdown (digestion) by biological organisms.

Buffering Capacity: The ability of a soil to resist chemical changes. The major buffering system for soils is the cation exchange capacity.

Bulk Density: Measurement of soil compaction expressed as a weight per unit of soil (grams per 100 cc).

Carbohydrates: Plant food sources including sugars and starches containing carbon with hydrogen and oxygen in a 2 to 1 ratio, as in water (H₂O).

Carbon-Nitrogen Ratio: Ratio of organic carbon weight to total nitrogen weight in soil or organic material.

Cation Exchange Capacity: Sum of exchangeable cations a soil can adsorb and retain against leaching and is expressed as centimoles per kg of soil or milliequivalent per 100 grams of soil. Sometimes referred to as the CEC.

Chelate: Cyclic structures of a normally non-soluble metal ion and an organic component that, when held together, become soluble in water.

Chlorosis: Yellowing of normally green plant tissue due to chlorophyll loss.

Water Insoluble Nitrogen (WIN): Insoluble nitrogen fertilizer fractions associated with urea reaction fertilizers that are insoluble in cold water (72 F).

Water Soluble Nitrogen (WSN): Soluble nitrogen fertilizer fractions associated with urea reaction fertilizers that are soluble in cold water (72 F).

Colloids: Very small particles that are formed during the weathering process of soils.

Crown: A meristematic growing point at or just below the ground where stems and roots join and new shoots emerge.

Denitrification: The biological conversion of nitrate or nitrite to gaseous nitrogen as either N₂ or N₂O.

AGRONOMIC GLOSSARY

Dethatching: Removal of excessive turfgrass thatch and/or mat using stiff rakes or a series of vertically mounted knives or tines.

Effluent: Partially or completely treated waste water from a treatment plant, reservoir, or basin.

Electrical Conductivity (EC): A measure of salinity using electrical conductance expressed millimhos per centimeter (mmhos/cm) or decisiemens per meter (dS/m).

Element: A substance composed of only one kind of atom. These combine to compose all materials.

Enzyme: A complex organic agent that enhances cellular reaction rates without being altered in the process.

Exchangeable Sodium Percentage (ESP): A measure of excessive sodium hazard in the soil as the ratio (as percent) of exchangeable sodium to the remaining exchangeable cations (Ca, Mg, and K).

FertilizerBurn: Plant injury from dehydration due to contact with materials containing salts.

Heavy Metals: Metals with densities of 5 mg per meter or greater and include Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Pb, and Zn.

Hot Water Insoluble Nitrogen (HWIN): Insoluble nitrogen fertilizer fraction associated with urea reaction fertilizers that is insoluble in hot water (212 F).

Humate (humins): Portion of soil organic matter that is insoluble in dilute alkali.

Humic Acid: Portion of humus that is water insoluble and is extracted from soil with dilute alkali and precipitated upon acidification.

Humus: Relatively stable, dark-colored colloidal soil organic matter containing no recognizable plant parts.

Hydraulic Conductivity: Rate of water flow in soil as imposed by a hydraulic head.

Hydrolysis: Splitting of one molecule by addition of water.

Immobilization: Conversion of an element from the inorganic form to the organic form in microbial or plant tissues. Often used to describe the conversion of nitrate or ammonium into organic forms by soil microorganisms.

Infiltration Rate: Downward movement or entry of water into the soil.

Ions: Electrically charged atoms resulting from the loss of electrons (cations) or gain of electrons (anions).

Leaching: Downward movement of soluble materials through a soil.

Lime: Calcium oxide (CaO) and/or a variety of acid neutralizing materials containing Ca, Mg, or both Ca and Mg.

Macronutrient: Nutrients needed in largest amounts (usually 50 mg/kg) for plant growth (e.g. C, N, O, K, Ca, Mg S, and H).

Micronutrient: Elements or nutrients needed in only small amounts (usually less than 50 mg/kg) for plant growth (e.g. B, Cl, Cu, Fe, Mn, and Zn).

Mineralization: Conversion of an organic form of an element to an inorganic form (e.g. conversion of organic nitrogen to ammonium nitrogen) by microbial decomposition.

Nitrification: Microbial oxidation of ammonium nitrogen to nitrites and eventually to nitrates.

Organic Matter: Residual decomposition of plant or animal content in soil.

Osmosis: Diffusion of water or any solvent (pure liquid) from a region of greater water potential to one of lesser water potential across a selectively permeable membrane.

Oxidation: Loss of an electron by an atom or molecule where oxygen is the electron acceptor.

Peat: Partially decomposed organic matter accumulating under wet conditions.

Percolation Rate: Downward movement of water through a soil profile.

pH: Degree of acidity or alkalinity. Defined as the negative logarithm of hydrogen ion activity. A scale of 0 to 14 is used where 7 is neutral, below 7 is acidic and above 7 is alkaline.

Sewage Sludge / Bio-Solids: Settled sewage solids removed by screening, sedimentation, chemical precipitation, or bacterial digestion.

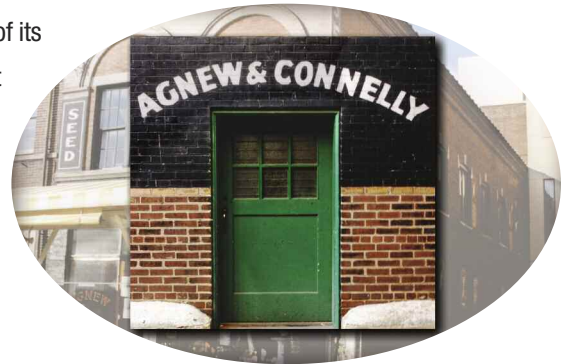
Thatch: Brown to black colored layer of dead turfgrass plant leaves, stems, rhizomes, crowns, and stolons between the green colored vegetation and the soil surface.

WHO ARE WE & WHERE DID WE COME FROM

More than a half century ago, when our grandfather, W.S. Connelly, first opened the doors of our company, the world was a very different place. Our culture was based on a challenging work ethic, business could be done on a handshake. A man's character was defined by his integrity and humility. The family is where the lessons of honesty and morality were born.

W.S. was a product of his times and operated his business as the WWII generation lived their lives. It is the same core set of values that exist at Landscape Supply, today. Three generations of his family would sustain the founder's commitment to the principals of a past. The lesson of extraordinary customer service became a legacy handed down generation to generation. It was a promise kept to every client. It was an expectation of every employee. It remains the heartbeat of a management philosophy, a way of doing business – a passion.

The story of Landscape Supply begins as a modest feed and seed business, and because of its continued mission to support and educate its customers, it has emerged as one of the most successful regional companies in the mid-Atlantic. Kevin and Patrick Connelly, the third generation of the family ownership, are nurturing a customer-centered culture and remain committed to the business and family values of their grandfather five decades ago. While the economy rose and fell, competitors came and went, and the industry evolved and changed, the Connelly's pledge to its customers never budged.



Landscape Supply is not your typical employer. It is a place where the managers make deliveries and the owners are in front of the customers, while employees are empowered to solve management and operational challenges. One-half of the company's team have joined professional associations that contribute to the industry. It is the kind of company where managers and employees stay on the job into the early hours of the morning, ensuring a delivery is completed on time. It is a place where the employees never leave and prove daily the kind of loyalty that the competition seems unable to achieve.



It is what W.S. had in mind all along.

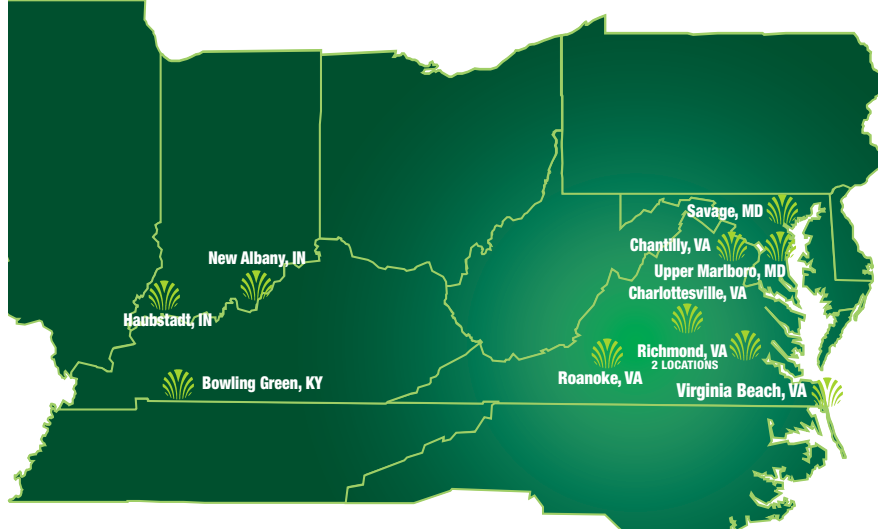
Landscape Supply understands the value of community. Whether it's collecting and donating seventy-five hundred cans of food, sponsoring a college scholarship, raising money to increase awareness of the green industry, or offering more than thirty educational events for its customers each year. It is a company that believes it's their responsibility to be good neighbors and give back to the people it serves.

As the industry consolidates and regional companies, such as ours, battle for survival, we continue to grow. What makes us different? We point to our core set of values that would make W.S. proud. Our pledge to our customers will always remain a constant: business integrity, customer focus, innovation, operational excellence, leadership and accountability.

Thank you for the opportunity to earn your business.

Patrick Connelly
PRESIDENT

Kevin Connelly
VICE PRESIDENT



OUR LOCATIONS

Roanoke, VA

Address: 101 Madison Avenue, NW
Roanoke, VA 24016
Phone: 800-876-2151

Charlottesville, VA

Address: 2424 Richmond Road
Charlottesville, VA 22902
Phone: 434-979-8873

Midlothian, VA

Address: 2501 Oak Lake Boulevard
Midlothian, VA 23112
Phone: 804-744-5445

Henrico, VA

Address: 12115 Ridgefield Parkway
Henrico, VA 23238
Phone: 804-754-3590

Virginia Beach, VA

Address: 513 Viking Drive
Virginia Beach, VA 23452
Phone: 757-340-8873

Chantilly, VA

Address: 14805 Willard Road
Chantilly, VA 20151
Phone: 703-659-4901

Upper Marlboro, MD

Address: 671 Commerce Drive
Upper Marlboro, MD 20774
Phone: 240-547-4614

Savage, MD

Address: 8869 Greenwood Place, Suite C
Savage, MD 20763
Phone: 301-725-7333

Haubstadt, IN

Address: 100 East Haub Street
Haubstadt, IN 47639
Phone: 812-768-6157

New Albany, IN

Address: 4112 Reas Lane
New Albany, IN 47150
Phone: 812-913-1169

Bowling Green, KY

Address: 5283 Nashville Road
Bowling Green, KY
Phone: 270-599-0091





W.S.CONNELLY & COMPANIES

LANDSCAPE SUPPLY, INC.

ENVIRONMENTAL CONSTRUCTION SOLUTIONS

CHESAPEAKE VALLEY SEED

TENBARGE

HYDRASMART

PRESCRIPTION TURF SERVICES

www.wsconnelly.com