



Knowledge grows



optimumturf ™

by Yara

Turf and Landscape Product Guide





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CROP HEALTH
QUALITY NUTRIENTS

EFFICIENCY
DIGITAL TOOLS

PEACE OF MIND
AGRONOMIC EXPERTISE

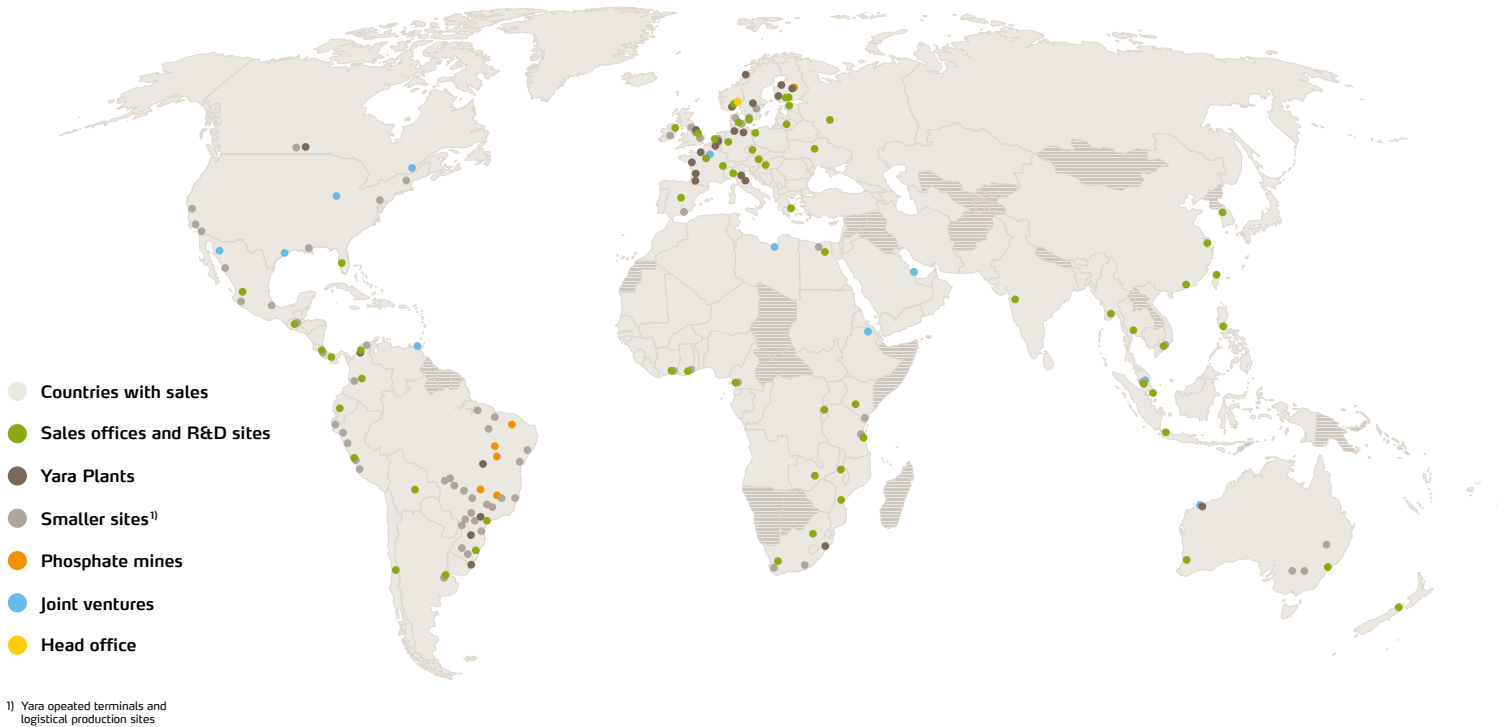


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by Yara

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Founded in
1905

Number of Employees:
**More than
17,000**

Operations in
**Over
60**
Countries

About Yara

In collaboration with customers and partners, Yara grows knowledge to responsibly feed the world and protect the planet, to fulfill its vision of a collaborative society, a world without hunger and a planet respected.

Our crop nutrition solutions and precision farming offerings allow farmers to increase yields and improve product quality while reducing environmental impact. Our environmental and industrial solutions improve air quality and reduce emissions, and are key ingredients in the production of a wide range of products. We foster an open culture of diversity and inclusion that promotes the safety and integrity of our employees, contractors, business partners, and society at large.

Founded in 1905 to solve emerging famine in Europe, Yara has a worldwide presence with more than 17,000 employees and operations in over 60 countries.



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Aspiration

Our aspiration is to be the leading provider of sustainable crop nutrition solutions, supporting farmer profitability through knowledge, quality and productivity.

Mission Responsibly feed the world and protect the planet

Our Vision A collaborative society; a world without hunger; a planet respected



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A photograph of two men walking on a golf course. The man on the left is wearing a blue polo shirt, light-colored pants, and a white visor. The man on the right is wearing a light-colored polo shirt and khaki pants. They are walking on a well-maintained green. In the background, there are large, leafy trees and a flagpole with an American flag. The scene is bright and sunny.

Yara's OptimumTurf solution combines knowledge, product efficacy, and analytical tools for exceptional turf health and aesthetics. With Yara, growers have access to the most comprehensive portfolio in the market and the latest in precision plant nutrition for minimal waste and maximum environmental sustainability.

Turfgrass Nutrition

Crown health and
new shoot emergence

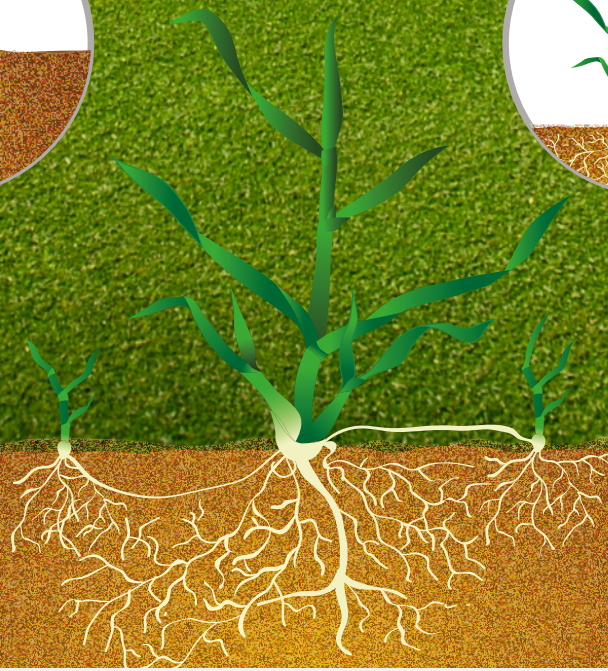
K **B** **Zn**

Root growth and
establishment

Ca **P** **K**

Leaf growth and
healthy canopy

N **K** **Mg** **Fe**
Cu **S** **Mn** **Mo**



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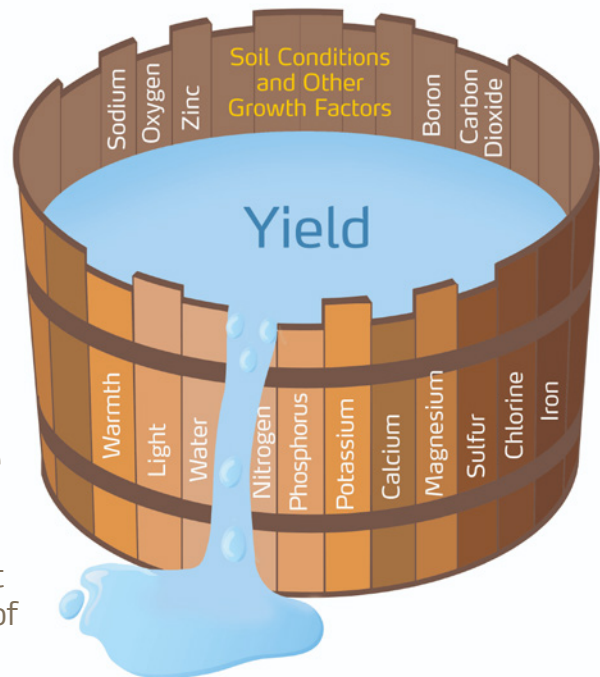
Turfgrass Nutrition

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Turf and ornamental nutrition varies by segmentation and species. Depending on the specific use and location, nutritional inputs and management strategies are vastly different.

A balanced nutritional program is the best way to ensure a healthy plant. Economically, proper plant nutritional programs save managers significant amounts of money if proper steps are taken. The term "balance nutrition" directly supports the 4R approach of Right Source, Right Placement, Right Rate, and Right Time. The benefits of pursuing balanced nutrition through 4R stewardship ensures that turf and ornamentals have the strength to persevere against common abiotic stresses.

All plant nutritional decisions should start with a soil analysis for providing a base line for understanding the current nutrient status. Soil analysis also serve as a great tool for learning about other important factors that could greatly deter nutrient availability. The pH, CEC and base saturation levels on soil reports are important to analyze when building fertility programs for maximum plant health. Additionally, tissue sampling is great for determining nutrient uptake from the soil, but should be performed regularly and between applications.





Essential Elements

Nitrogen, phosphorus and potassium are the most common nutrients that are known on turf and ornamentals. However, this does not mean that other nutrients are less important. Carbon, hydrogen and oxygen make up over 90% of the plant and are crucial for plant survival and are mostly supplied by air and water. Other important macronutrients are Nitrogen (N),

Phosphorus (P) and Potassium (K), Magnesium (Mg), Calcium (Ca) and Sulfur (S). Iron (Fe), Manganese (Mn), Zinc (Zn), Copper (Cu), Boron (B) and Molybdenum (Mo) are classified as micronutrients due to the low percentages that are required in the plant. Don't be misled by the term micronutrient, because these nutrients are equally important to sustain in

balance for plant uptake and utilization. In all, it is documented that there are 17 essential elements that are typically needed to sustain plant health. In the graph below, with the exception of C,H and O, there are 12 nutrients highlighted that deficiencies are commonly observed.

Element	Abbreviation	Sufficiency Range
Nitrogen	N	2.5 - 5%
Phosphorus	P	0.15 - .5%
Potassium	K	1.0 - 4%
Calcium	Ca	0.35 - 1.25
Magnesium	Mg	0.2 - 0.6%
Sulfur	S	0.2 - 0.5%
Iron	Fe	50 - 500 ppm
Manganese	Mn	25 - 300 ppm
Zinc	Zn	20 - 200 ppm
Boron	B	6 - 30 ppm
Copper	Cu	5 - 50 ppm
Molybdenum	Mo	0.10 - 1.20 ppm



Ca

Calcium is responsible for proper cell division and assists in protecting new plant tissue

K

Potassium promotes rooting and the storage of carbohydrates, meristematic tissue, and increases thickness of outer cell walls improving abiotic and biotic stress tolerance, balances turgor pressure within cells and regulates water loss through transpiration

B

Boron is involved in auxin metabolism, root elongation, protein and phosphate utilization

Mg

Magnesium is an important component for chlorophyll production and activates enzymes for phosphate metabolism and cell respiration

Cu

Copper serves as a catalyst in photosynthesis and respiration

Mn

Manganese plays a key role in photosynthesis and oxide-reduction reactions in cells

P

Phosphorus is a key component of ATP and promotes root development, maturation, establishment and tillering

N

Nitrogen is used in the formation of proteins and stimulates leaf growth by producing new, darker green leaves

Zn

Zinc is involved in the conversion of ammonium to amino nitrogen, and is important for the development and function of growth regulators

Fe

Iron is essential for chlorophyll formation, increasing color and shoot growth

S

Sulfur is required for protein synthesis and nitrate metabolism

Mo

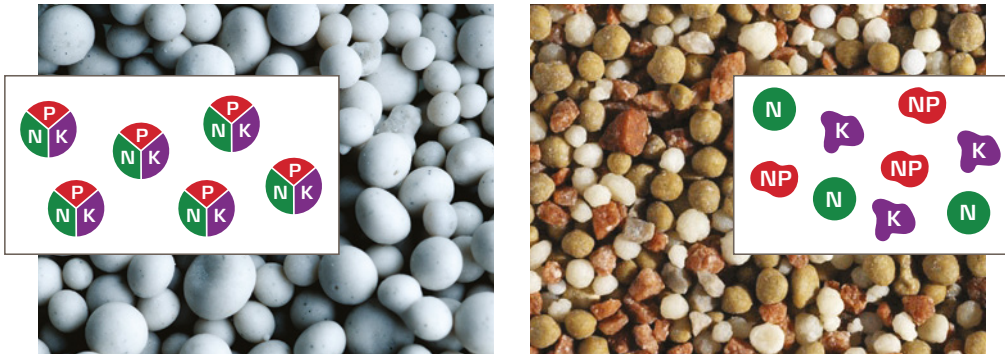
Molybdenum enables nitrogen utilization



Delivering Nutrients Effectively

When it comes to applying nutrients, the most common ways are by applying dry or liquid products. There are distinct differences in product formulations and quality. Products vary, especially when comparing homogeneous products to blends or formulated liquids to non-formulated solutions. The difference is in quality, a product that handles better and provides more plant uptake efficiency and use drives superior health.

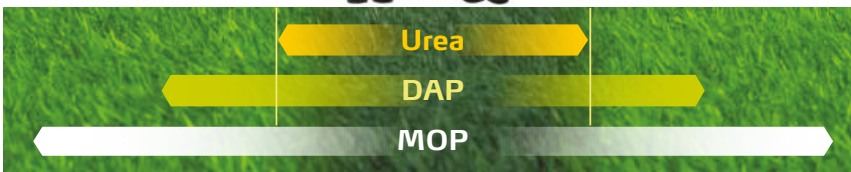
The Difference is Obvious



YaraMila®

Blend

Spreading width



Spreading with light particles like Urea is less than those of heavier particles like DAP and MOP.

Poor spreading patterns cause striped fields and significant yield losses.

Yara dry fertilizer products consist of homogeneous (compound) fertilizer particles that are superior over blends because all nutrients are available to the plant on each particle; this eliminates product segregation and inconsistencies of nutrient uptake.



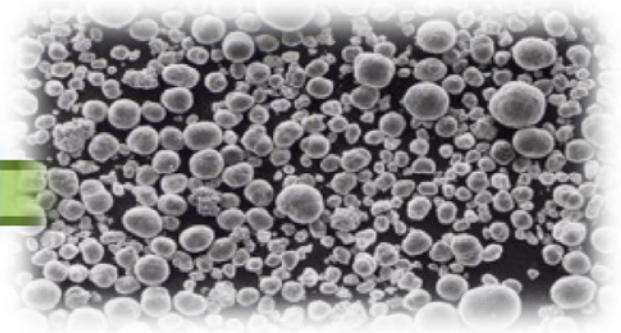
Spoon-Feeding with YaraVita OptimumTurf for Precise Nutrient Delivery

Liquid products used for spoon-feeding practices are crucial for high-maintained turf. The formulation of products are critical for ensuring efficient uptake and maximum utilization. Fully formulated products provide maximum benefits for ensuring a healthy plant while simplifying handling and mixing. YaraVita OptimumTurf foliar nutrition delivers a specific nutrient

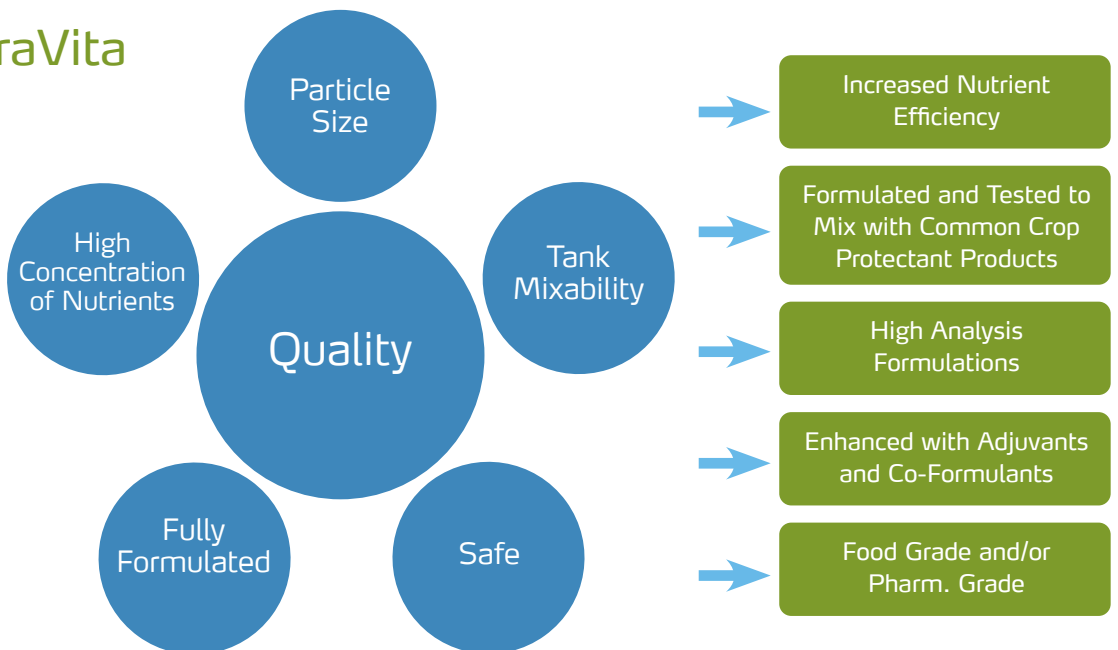
or nutrient mix exactly when and where the turfgrass needs it; boosting performance, durability, and aesthetics. Each YaraVita foliar product is formulated from consistently high quality nutrient compounds with co-formulates, such as wetters, stickers and absorption aids, to control and enhance performance.



All of YaraVita liquid products are fully formulated and enhanced for maximum uptake



Features of YaraVita OptimumTurf Formulations





Product Portfolio



YaraMila®

Homogeneous NPKs

Excellent for consistent applications without N, P and K segregation, each prill contains the same proportion. This ensures uniform distribution. YaraMila also contains sulfur to ensure optimum leaf chlorophyll content. YaraMila serves as a great product for both soil and foliar applications, and provides essential nutrient uptake for turf establishment and health.



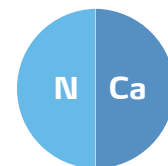
Product Name	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	pH	SGN	Product Use and Description
YaraMila 21-7-14 TURF ROYALE	21	7	14			5.1								280	Homogeneous NPK, SOP based, Ammonium Nitrate for quick green-up and sustained feeding
YaraMila 21-7-14 MINIPRILLS	21	7	14			5.1								170	Homogeneous NPK, SOP based, Ammonium Nitrate for quick green-up and sustained feeding



YaraLiva®

More than calcium nitrate

Provides directly available nitrogen and calcium for plant uptake with predictable growth responses. The calcium promotes increased cell wall strength for improved disease resistance, and increased overall plant strength. This also serves as a key nutrient for root development. The quick and readily available source of nitrogen aids in rapid turf establishment

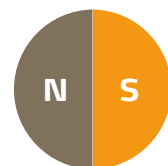


Product Name	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	pH	SGN	Product Use and Description
YaraLiva TROPICOTE	15.5	0	0	19										280	Dry formulation coated for easier handling.
YaraLiva CALCINIT	15.5	0	0	19									6	280	Greenhouse/solution grade calcium nitrate



YaraVera® AMIDAS TURF

YaraVera AMIDAS is ideal for soil or foliar applications, and serves as a key nutrient for root development especially during turf establishment. The 7:1 homogeneous source of nitrogen and sulfur allows for optimal uptake at the soil microsite causing a reduction in volatilization compared to a blend of urea and ammonium sulfate. This product line is formulated to have superior particle hardness compare to urea and ammonium sulfate, leading to less dust.

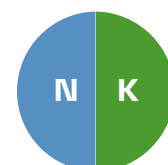


Product Name	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	pH	SGN	Product Use and Description
YaraVera AMIDAS TURF	40	0	0			5.5								280	Homogeneous Urea and Ammonium Sulfate



YaraTera® KRISTA K

YaraTera Krista K is a fully soluble nitrogen and potassium source that is perfect to use in spray solutions. It is the potassium source with the fastest action, accompanied by nitrate nitrogen and is immediately availability for plant uptake. Potassium is critical during maximum growth periods and for enduring traffic and pest injury.



Product Name	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	pH	SGN	Product Use and Description
KRISTA K	13.7	0	46												Soluble solution for supplying nitrogen and potassium without phosphorus, great for making foliar applications



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YaraVita®

Foliar nutrition and coatings

Encompasses a vast range of foliar nutrition and coating products, developed specifically for balanced nutritional applications, as a foliar spray, fertilizer coating, or soil application through fertigation systems. Specifically formulated with enhancers for foliar applications used to target nutrient deficiencies for fast and effective plant uptake.

Product Name	N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	pH	lb/gal	Product Use and Description
YaraVita ACTIVATE*	4	0	0		20								10.0-11.0	12.6	For the treatment of magnesium deficiency and aids in early green-up.
YaraVita GUARD	0	7	0					7					0.8-1.2	10.9	For supplying a balance of manganese and phosphorus that aids in overall plant strength and energy.
YaraVita MAINTAIN	3	15	7						0.7		0.7	0.4	6.6-6.9	10.9	Formulated to supply balance nutrition with micros for enhancing uptake and overall plant health.
YaraVita PRISTINE GREEN	0	0	0				3.9						7.1	11.5	Chelated iron to encourage chlorophyll production and efficient uptake of iron.
YaraVita REVIG	3	0	34										8.5-9.5	12.16	For the treatment of potassium deficiency and increasing stress tolerance.
YaraVita ROOTS	0	29	5		4								1.0-1.2	12.34	Formulated for driving phosphorus into and through the plant for maximizing energy production and root growth.
YaraVita SAFE N	25	0	0										8-9.5	10.41	Formulated to supply a slowly available nitrogen for an efficient and consistent growth response.
YaraVita SYNTHESIZE	0	7	0						7.5				0.8-1.2	11.3	For supplying a balance of zinc and phosphorus for activating growth.

Dry Formulation ** Soluble Powder
 Liquid Formulation * Suspension Concentrate







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Yara Products as a Blend Base

Often times, Yara OptimumTurf products are viewed as end-user ready products and are used for producing superior results. However, YaraMila and YaraVera are capable of being

used as blend bases. Because of these products' handling characteristics and homogeneous properties, they make the perfect product for blends. Adding products with multiple nutrients on each

prill eliminates products added while still producing the same dependable results. Ask your distributor for details on adding these products to blends.



YaraMila[®]
Homogeneous NPKs

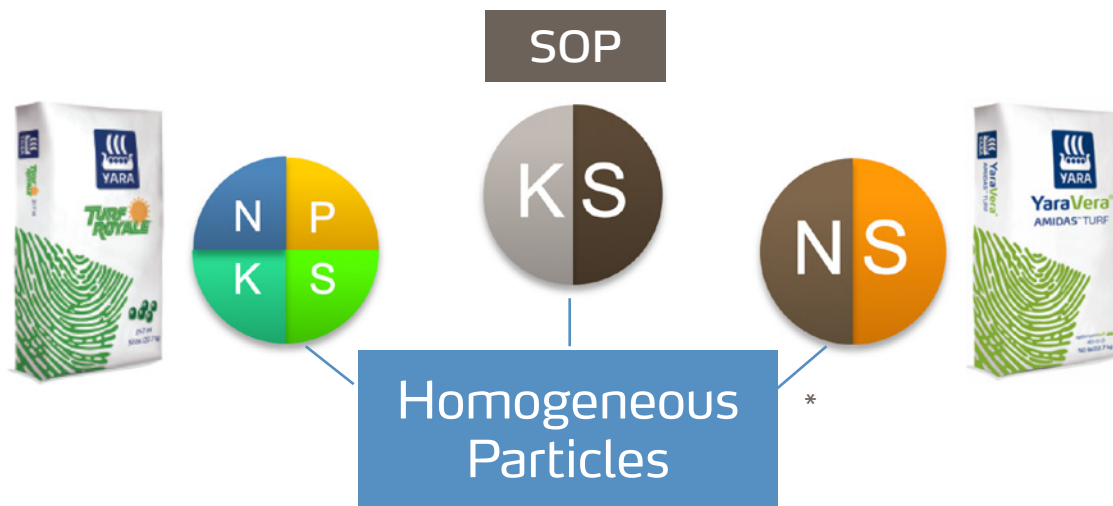
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YaraVera[®]
Homogeneous Urea
& Ammonium Sulfate

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Blend 1 [2:1]			
YaraMila Turf Royale 21-7-14		40%	
CR YaraVera Amidas Turf 60 day		40%	
SOP		20%	
N	P	K	S
23%	2%	15%	7.8%

Blend 2 [1:1]			
YaraMila Turf Royale 21-7-14		35%	
CR YaraVera Amidas Turf 60 day		35%	
SOP		30%	
N	P	K	S
20%	2%	20%	9.1%

Blend 3 [1:2]			
YaraMila Turf Royale 21-7-14		35%	
CR YaraVera Amidas Turf 60 day		20%	
SOP		45%	
N	P	K	S
15%	2%	27%	11%

Blend 4 [2:1] ZeroPhos			
CR YaraVera Amidas Turf 60 day		65%	
SOP		35%	
N	P	K	S
24%	0%	17%	9.8%

Blend 5 [2:1] CR Turf Royale			
YaraMila Turf Royale 21-7-14		50%	
CR YaraVera Amidas Turf 60 day		50%	
N	P	K	S
20%	6%	13%	5%

* These are only a few examples of economically and agronomically beneficial blends that can be formed using Yara's homogeneous products. Other combinations of substrates combined with Yara's homogeneous products could be considered.



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TURF ROYALE 21-7-14

Professional Grade Turf and Landscape Fertilizer			
Total Nitrogen (N)	21.0%	Combined Sulfur (S)	5.1%
Nitrate N (NO ₃)	9.9%	Bulk density (loose)	68 lb/ft ³ (+-5%)
Ammonium N (NH ₄)	11.1%	Granulometry (-5 +10) Tyler Mesh - SGN 280	
Available P ₂ O ₅	7.0%	Angle of Repose	26°
Soluble K ₂ O	14.0%	Color	White
Derived from Ammonium Nitrate, MAP, DAP, Dicalcium Phosphate and Potassium Sulfate			



TURF ROYALE 21-7-14: Quality Turf - Start to Finish

Professional Turf and Landscape Fertilizer

Get a good start with TURF ROYALE 21-7-14 when establishing quality turf or feeding ornamentals. TURF ROYALE 21-7-14 provides N, P, and K the right way – ammonium and nitrate nitrogen, 100% available phosphate, and potassium and sulfate-sulfur in every prill.

Split Nitrogen – Fast Response & Sustained Feeding

TURF ROYALE 21-7-14 supplies nitrate nitrogen for quick green-up even in cool weather, and ammonium nitrogen for sustained feeding.

The phosphate in TURF ROYALE 21-7-14 is highly water soluble and 100% available for optimal root growth, turf grass establishment and stress reduction.

Soluble Sulfate of Potash – Potassium and sulfur are used for maintenance of attractive turf in high traffic areas and to aid in resistance to turf diseases and weather stress.

High analysis –TURF ROYALE 21-7-14 contains N, P and K in the proper 3-1-2 ratio to sustain vigorous plants with high stress resistance.

Homogeneous Prills – no segregation of nutrients. Everyprill contains the stated grade of nutrients. TURF ROYALE 21-7-14 feeds accurately and uniformly without “hot spots” when applied through properly calibrated equipment.

Benefits

- Homogeneous, dust free prills with ideal N-P-K-S ratio for high performance sports turf.
- High concentration, with 2 types of nitrogen: Nitrate for quick response and Ammonium for lasting feeding.
- Low salt index, very safe for turf.
- Easy and accurate calibration.



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YaraVera[®] AMIDAS[™] TURF

Granular nitrogen and sulfur fertilizer			
Total Nitrogen (N)	40.0%	Sulfur (S)	5.5%
Urea N	35.0%	Bulk Density (loose)	49 lbs/cu ft
Ammonium N (NH ₄)	5.0%	Color	Clear Yellow

Increase growth potential with enhanced N use efficiency

YaraVera AMIDAS TURF is a 7:1 homogeneous source of nitrogen and sulfur that allows for optimal uptake at the soil microsite causing a reduction in volatilization compared to blends.

- Nitrogen is essential for structural and functional proteins and stimulating turf growth.
- Sulfur is an important component of proteins and required for nitrate metabolism.

Superior handling, consistent spreading and easy to solubilize for spray applications

YaraVera AMIDAS TURF is formulated to have superior particle hardness compared to urea and ammonium sulfate.

- Less dust, therefore, less nutrient loss.
- Precisely formulated with nitrogen and sulfur on each particle for consistent spreading without product segregation.
- YaraVera AMIDAS TURF spreads consistently without noticeable stripping and irregular growth patterns.

Dissolves quickly for adding to spray solutions to conduct spoon-feeding applications.

Both nitrogen and sulfur form plant proteins, enzymes and vitamins, which regulate nearly all processes in the plant; photosynthesis and synthesis of sugar. These two nutrients combined enhance nitrogen utilization and increases turf color and vigor.

Need to sulfur

Turf requires sulfur. YaraVera AMIDAS TURF provides readily available sulfate-sulfur to meet optimal turf health and aesthetics.

The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.



Benefits

- YaraVera AMIDAS TURF is a high quality granular fertilizer containing nitrogen and sulfur.
- The nitrogen supplied is in the urea and ammonium forms. Readily available sulfur is from sulfate.
- The ratio between N and S, 7 to 1, is ideal for turf growth and aesthetics.
- YaraVera AMIDAS TURF is a free flowing granular fertilizer which can be handled in bulk as well as in bags.

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Quick Response and Healthy Roots

YaraLiva® CALCINIT®

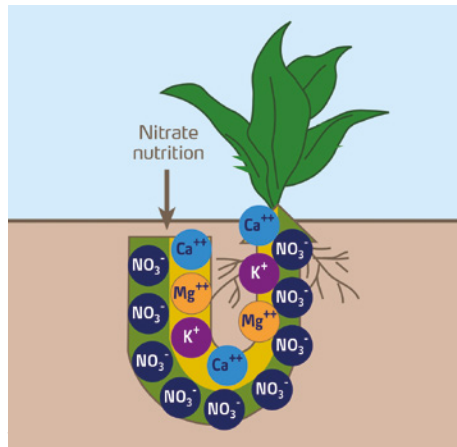
Soluble Grade Calcium Nitrate			
Total Nitrogen (N)	15.5%	solubility (20° C)	1200 g/l water
Nitrate N (NO ₃)	14.5%	EC (1 g/l at 25° C)	1.2 mS/cm
Ammoniacal N (NH ₄)	1.0% (1.5% max)	pH (10% solution)	6.0
Soluble Calcium (Ca)	19.0%	Color	White
Water Insolubles	0.035%	Bulk Density	68 lb/ft ³ +5% Loose

Nitrate Nitrogen

Directly available for plant uptake, nitrate nitrogen results in fast and predictable growth responses. It's non-volatile nor absorbed to soil particles, leaving it readily available to plants. This is the preferred nitrogen source for most turf and ornamental applications, and improves plant uptake of the cations potassium, calcium and magnesium.

Calcium

Calcium improves cell wall strength leading to a plant that has more ability to endure plant stress, especially during drought, high traffic and pest attack. Calcium helps to maintain an optimum root environment for intensely maintained turf.



Ammonium Calcium Nitrate Double Salt, can be mixed with all water soluble plant nutritional products, except stock solutions containing either phosphate or sulfate.

Benefits

- YaraLiva CALCINIT is a fully water soluble nitrogen and calcium fertilizer. It is a free flowing, fine granular or prilled material which dissolves quickly in water without any residues.
- YaraLiva CALCINIT is suited to application through all fertigation systems.
- YaraLiva CALCINIT is not an oxidizer, 49 CFR 172.102 special provision 34 specifically removes hydrated Ammonium Calcium Nitrate Double Salt from the DOT hazardous materials list 49 CFR 172.101.



Yara North America, Inc.
Customer Service: 1-800-234-9376
www.yara.us

The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.





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YaraLiva™ TROPICOTE™

TYPICAL ANALYSIS	
Total Nitrogen (N)	15.5%
1.0% Ammoniacal Nitrogen	
14.5% Nitrate Nitrogen	
Water Soluble Calcium (Ca)	19.0%
Derived from ammonium calcium nitrate double salt. Not DOT regulated.	

Appearance Counts!

We don't need to tell you how important turfgrass and landscape appearance is in our industry. And for healthy growth and attractive color, your landscape plants and turfgrass need lots of nitrogen. Without sufficient quantities of nitrogen, your plants exhibit a lower shoot density and a yellow-green color.

Replenish the Nitrogen

When grass clippings are removed with every mowing –such as on golf greens or highly maintained landscaping –turf loses significant nitrogen. It has to be replenished. That's why **YaraLiva™ TROPICOTE™** gives you a non-volatile, non-acid forming, quick response, and water-soluble, nitrate fertilizer that is immediately available for uptake by roots. So you can have quick, controlled green-ups time after time, regardless if its cold or hot.

Don't Forget the Calcium

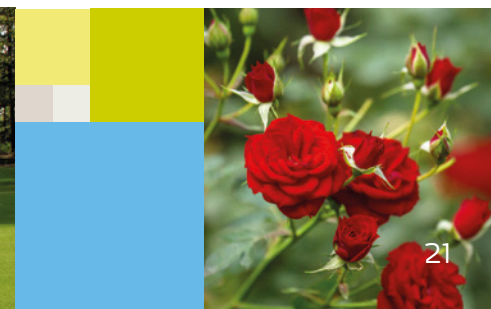
Of all the nutrients taken up by plant roots, calcium ranks third after nitrogen and potassium. It's a component of cell walls and increases cell wall strength for a stronger plant overall. Proper cell division also requires calcium, so this element is vital for healthy leaf and root growth. This means the 100% soluble calcium in **YaraLiva™ TROPICOTE™** is an important booster for plant vigour, strength and appearance.



Benefits for the Landscape Professional

- Completely water soluble and immediately available for uptake
- Homogeneous, dust free, non-burning
- Moisture resistant and dust suppressant coating

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Customer Service: 1-800-234-9376
www.yara.us





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YaraVita[®] ACTIVATE™

A formulated product for the treatment of magnesium deficiency by foliar application

Guaranteed Analysis:	
Total Nitrogen (N)	4.0%
Urea Nitrogen	4.0%
Magnesium (Mg)	20.0%
Derived from Urea, Magnesium Hydroxide	

The information provided is accurate to the best of Yara’s knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

Magnesium is important for highly maintained turf and must be maintained in balance within the plant and in soil concentrations. Magnesium is a constituent of chlorophyll and is important for maintaining emerald green turf, which is essential for enhancing the photosynthesis process.

As a key activator in protein synthesis and key enzymes, Mg helps turf respond to heat, drought, traffic and pest pressure. Mg is involved in the transport of soluble carbohydrates from leaf tissue to points of utilization in the roots, stolons, rhizomes and crown, therefore, important for ensuring proper root growth and structure.

Application

Turfgrass:

Apply 1 to 3 fl oz per 1000 sq ft in a water volume of 0.5 to 1.5 galls/1000 sq ft every 7 - 14 days as needed during the growing season based on nutritional requirements.

Nursery stock/ornamentals (outdoor):

1 - 2 qts. Per 100 gallon of water.

Repeat at 10 - 14 day intervals as necessary. Do not apply during flowering.



Benefits

- Formulated for safe application at critical growth stages to satisfy turf requirements
- Widely tank mixable with other turf sprays. Visit www.tankmix.com/yara for details.
- Tested on a wide range of crops worldwide for safety.
- High quality, consistent product. Manufactured to ISO 9001 quality assurance standards
- Easy to use liquid formulation. Pours and disperses easily and quickly into the spray tank.
- High nutrient content for easily correcting deficiency issues.





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YaraVita[®] GUARD[™]

A liquid manganese and phosphorus product formulated for foliar application

Guaranteed Analysis:	
Available Phosphate (P ₂ O ₅)	7%
Manganese (Mn)	7%
7% water soluble Manganese (Mn)	
Derived from Phosphoric Acid, Manganese Sulfate	

The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

Why Foliar Apply?

YaraVita Guard is a unique manganese (Mn) and phosphorus (P) product specifically designed for safe application of nutrients at critical growth stages and to mitigate deficiencies. Together these two nutrients are critical for root elongation and lateral root formation.

Manganese requirements:

Manganese (Mn) is involved in the function of many enzymes that are important to turfgrass physiological processes. Most notably the detoxification and water splitting enzymes that provide oxygen to form carbohydrates. Mn deficiency reduces chlorophyll content, lignin synthesis and effective nitrogen utilization and could lead to lower resistance to common turf stress factors.

Phosphorus requirements:

Phosphorus (P) availability in the soil is affected by pH, soil temperature, nutrient interactions and overall mobility. P is involved in the energy transport system within turf known as ATP and is used to drive many chemical processes that are important for ensuring healthy turf during high metabolic activity and to encourage recovery from turf stress.

Application

Turfgrass:

0.5 to 1.1 fl oz per 1000 sq ft in a water volume of 0.5 to 1.5 Gallons/1000 sq ft every 7-14 days during the growing season based on nutritional requirements.

Nursery stock/ornamentals:

1 - 2 qts. Per 100 gallon of water. Repeat at 10 - 14 day intervals as necessary. Do not apply during flowering.



Benefits

- Reduces herbicide stall.
- Formulated for safe application at critical growth stages to satisfy turf requirements.
- Widely tank mixable with other turf sprays, including glyphosate. Visit www.tankmix.com for details.
- Tested on a wide range of crops worldwide for safety.
- High quality, consistent product. Manufactured to ISO 9001 quality assurance standards.
- Easy to use liquid formulation. Pours and disperses easily and quickly into the spray tank.



Knowledge grows

YaraVita[®] MAINTAIN[™]

The first step to foliar nutrition is an easy to use formulation that contains a blend of macro and micronutrients to enhance turf health.

Guaranteed Analysis:	
Total Nitrogen (N)	3%
3% Urea Nitrogen	
2% Ammoniacal Nitrogen	
Available Phosphate (P ₂ O ₅)	15%
Soluble Potash (K ₂ O)	7%
Zinc (Zn)	0.7%
0.7% Chelated Zinc	
Boron (B)	0.7%
Molybdenum (Mo)	0.4%

The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

A multi turf, multi purpose product that is highly tankmixable and easy to use. The high concentration of P & K in YaraVita MAINTAIN provide plants with nutrients for root stimulation and water use management when faced with various turf stress conditions.

Highly maintained turfgrass is in constant demand for balanced nutrition for enhancing overall turf health and replenishing nutrient loss. YaraVita Maintain helps ensure the plant is getting a mixture of critical nutrients for turfgrass including nitrogen, phosphorus, potassium, boron, zinc and molybdenum and is mixable with many commonly used pesticides.

Application

Turfgrass:

Apply 1 to 3 fl oz per 1000 sq ft in a water volume of at least 1.5 Gallons/1000 sq ft every 7 - 14 days as needed during the growing season.

Nursery stock/ornamentals:

1 - 3 qts. Per 100 gallons of water. Repeat at 10 - 14 day intervals as necessary. Do not apply during flowering.



Benefits

- Reduces herbicide stall,
- Boosts root growth,
- Contains B, Zn, and Mo to prevent hidden hungers.
- Easy to use clear liquid solution that mixes with common pesticides.
- Humectant properties allow for better uptake.
- No need for additional surfactants.
- Special designed container for easier handling and pouring.





Knowledge grows

YaraVita[®] PRISTINE GREEN[™]

A formulated product for the treatment of iron deficiency by foliar application

Guaranteed Analysis:	
Iron (Fe)	3.9%
3.9% chelated Iron Derived from iron EDDHA	

The information provided is accurate to the best of Yara’s knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

YaraVita Pristine Green is a soluble source of Iron (Fe), chelated in the form of EDDHA for enhancing and sustaining uptake efficiently over a wide range of pH variances.

Iron (Fe) is the most required micronutrient for turfgrass and has many important physiological functions. Fe uptake can be affected by many soil factors that are detrimental to Fe uptake. It is important to apply Fe in a highly soluble form to avoid precipitation and becoming unavailable. Fe is critical for chlorophyll formation and many photosynthetic activities, which is critical for ensuring healthy turf.

Application

Turfgrass:

0.25 to 1.0 fl oz per 1000 sq ft in a water volume of at least 1.5 Gallons/1000 sq ft every 7-14 days during the growing season based on nutritional requirements.

Nursery stock/ornamentals:

Apply 2 fl. oz per 1,000 sq. ft. or 2-4 fl. oz. per 1,000 row feet every 5-6 weeks based on nutritional requirements.



Benefits

- Formulated for safe application at critical growth stages to satisfy turf requirements
- Widely tank mixable with other turf sprays. Visit www.tankmix.com/yara for details.
- Tested on a wide range of crops worldwide for safety.
- High quality, consistent product. Manufactured to ISO 9001 quality assurance standards
- Easy to use liquid formulation. Pours and disperses easily and quickly into the spray tank.
- High nutrient content for easily correcting deficiency issues.



Knowledge grows

YaraVita[®] REVIG[™]

A potassium fertilizer solution for foliar application

Guaranteed Analysis:		
Total Nitrogen (N)		3%
3% Urea Nitrogen		
Soluble Potash (K ₂ O)		34%
Derived from Urea, Potassium formate		

The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

The need for potassium

Potassium (K) is involved in a number of metabolic processes in the plant (cell membrane structure, carbohydrate metabolism and energy accumulation and utilization as well as the transport of sugars within the plant). Most notably, K plays a major role in turgor pressure and regulation of water movement through the stomata. Potassium helps reduce turfgrass stress related to drought, frost, traffic and pest pressure.

Deficiency Symptoms

Potassium is mobile in the plant, the older leaves show deficiency symptoms while the youngest leaves can remain quite green and healthy. Deficiency symptoms on turf occur on older leaves by showing interveinal yellowing and the rolling and burning of the leaf tip, and eventually forming necrotic spots on leaf margins making it more vulnerable to damage and poor recuperative potential.

Application

Turfgrass:

Apply 1 to 3 fl oz per 1000 sq ft in a water volume of 1.5 Gallons/1000 sq ft every 7 - 14 days as needed during the growing season based on nutritional requirements.

Nursery stock/ornamentals:

1 - 2 qts. Per 100 gallon of water. Repeat at 10 - 14 day intervals as necessary. Do not apply during flowering.



Benefits

- Highly concentrated liquid potassium formulation for foliar application with superior plant uptake due to its low point of deliquescence.
- Fast acting and highly mobile within the plant.
- Formulated from potassium carbonate, so it is suitable for use on a wide range of turfs because it does not contain chloride.
- Formulated for safe application at critical growth stages to satisfy turf requirements.
- Widely tank mixable with other turf sprays. Visit www.tankmix.com for details.
- Specifically designed to safely mix with lower pH products.





Knowledge grows

YaraVita[®] ROOTS[™]

A formulated product for providing a highly efficient form of phosphorus, potassium and magnesium for maximizing root growth and stress tolerance.

Guaranteed Analysis:	
Available Phosphate (P ₂ O ₅)	29%
Soluble Potash (K ₂ O)	5%
Magnesium (Mg)	4.1%
4.1% Water Soluble Magnesium (Mg)	

The information provided is accurate to the best of Yara’s knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

Give your turf the energy it needs by applying YaraVita Roots to enhance root growth and stress tolerance by providing a combination of nutrients that maximize energy production and cellular health!

- Immediately available phosphate gives your turf energy.
- Magnesium is the key building block of chlorophyll and enhances the utilization of phosphorus.
- Potassium drives cell growth, cell health, and water utilization.

Together, phosphorus, potassium and magnesium are an unbeatable combination for building roots and driving growth!

Application

Turfgrass:

Apply 1 to 3 fl oz per 1000 sq ft in a water volume of 0.5 to 1.5 Gallons/1000 sq ft every 7 - 14 days as needed during the growing season based on nutritional requirements.

Nursery stock/ornamentals:

1 - 3 qts. Per 100 gallon of water. Repeat at 10 - 14 day intervals as necessary. Do not apply during flowering.



Benefits

- Formulated for safe application at critical growth stages to satisfy turf requirements,
- Widely tank mixable with other turf sprays. Visit www.tankmix.com/yara for details.
- Tested on a wide range of crops worldwide for safety.
- High quality, consistent product. Manufactured to ISO 9001 quality assurance standards.
- Easy to use liquid formulation. Pours and disperses easily and quickly into the spray tank.
- High nutrient content means lower application rates reducing handling time.



Knowledge grows

YaraVita[®] SAFE N[™]

A concentrated nitrogen product formulated for foliar application

Guaranteed Analysis: Soluble in water	
Total Nitrogen (N)	25% w/w

The information provided is accurate to the best of Yara’s knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

The need for nitrogen

Nitrogen is the most limiting nutrient in turf with a majority of nitrogen being applied as urea (46-0-0). Foliar nitrogen, such as Safe-N, is an excellent source of nitrogen for effectively delivering exactly what the plant needs through foliar applications.

- Provides both immediately and slowly available N
- Great source for controlling excess growth through consistent release rate
- Sustained feeding for supplying consistent N to accommodate turf demands

Deficiency Symptoms

Nitrogen is important for color, growth rate, density, pest occurrence and stress tolerance by serving as a vital constituent of the chlorophyll molecule, amino acids and proteins, nucleic acids, enzymes and vitamins.

Deficiency symptoms include yellowing and stunting of growth occurring on the older leaves first. Avoid weak turf and provide pristine conditions by applying a consistent supply of N without excessive growth.

Application

Turfgrass:

3 to 9 fl oz per 1000 sq ft in a water volume of 0.5 to 1.5 galls/1000 sq ft every 7 - 14 days during the growing season based on nutritional requirements.

Nursery stock/ornamentals:

(Outdoor) 0.5 to 2 gallons Per 100 gallon of water. Repeat at 10 - 14 day intervals as necessary. Avoid applications during flowering. Safe N 25-0-0 has been applied undiluted to some types of ornamentals and nursery stock. Since these plants vary widely in growth habit and leaf texture, some types are more susceptible to leaf or tip burn than others. It is recommended that the user try only a few plants at undiluted or concentrated rates and observe for a week before general applications are made.



Benefits

- 25% of nitrogen source as controlled release
- Formulated for rapid uptake and long term feeding
- Formulated to ensure rain fast
- Very crop safe at critical crop stages
- Proven reliable performance
- Easy to use liquid formulation
- Highly concentrated liquid reduces rates and handling time with less packaging waste
- Wide ranging tank mix profile: visit www.tankmix.com for details.

US-19-0766





Knowledge grows

YaraVita[®] SYNTHESIZE[™]

A liquid zinc and phosphorus product formulated for foliar application

Guaranteed Analysis:	
Zinc (Zn)	7.5%
Available Phosphate (P ₂ O ₅)	7%

The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

Why Foliar Apply?

YaraVita Synthesize is a unique Zinc (Zn) and phosphorus (P) product specifically designed for safe application of nutrients at critical growth stages and to mitigate deficiencies. Together these two nutrients are critical for growth activation and root elongation.

Zinc requirements:

Zinc is an essential nutrient involved in several metabolic processes; most notably protein development and carbohydrate synthesis. It is needed for both early plant development as well as the later stages of growth. Zinc is important in the synthesis of certain plant hormones and auxins for promoting growth. On closely mowed turf, deficiency symptoms can appear as desiccation and become a detriment to turf health.

Phosphorus requirements:

Phosphorus (P) availability in the soil is affected by pH, soil temperature, nutrient interactions and overall mobility. P is involved in the energy transport system within turf known as ATP and is used to drive many chemical processes that are important for ensuring healthy turf during high metabolic activity and to encourage recovery from turf stress.

Application

Turfgrass:

0.5 to 1.1 fl oz per 1000 sq ft in a water volume of 0.5 to 1.5 Gallons/1000 sq ft every 7-14 days during the growing season based on nutritional requirements.

Nursery stock/ornamentals:

1 - 1.5 qts. Per 100 gallon of water. Repeat at 10 - 14 day intervals as necessary. Do not apply during flowering.



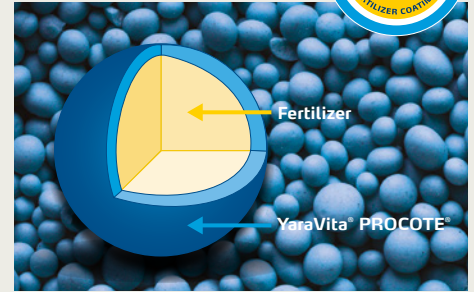
Benefits

- Reduces herbicide stall.
- Formulated for safe application at critical growth stages to satisfy turf requirements.
- Widely tank mixable with other turf sprays, including glyphosate. Visit www.tankmix.com for details.
- Proven, reliable performance. Tried and tested on a wide range of turfs around the world.
- High quality, consistent product. Manufactured to ISO 9001 quality assurance standards.
- Easy to use liquid formulation. Pours and disperses easily and quickly into the spray tank.



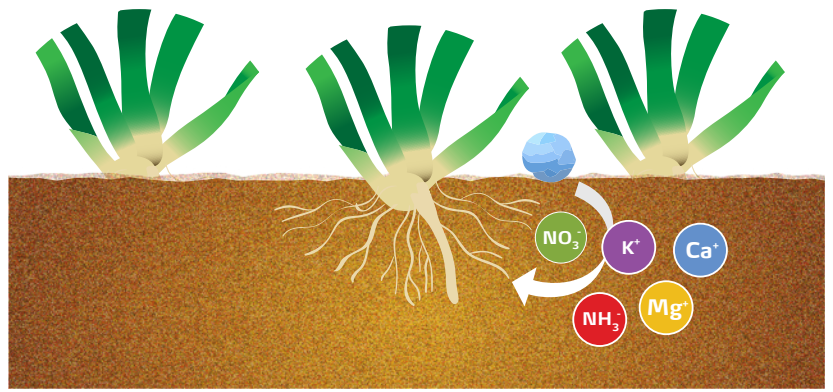
Knowledge grows

YaraVita[®] PROCOTE[™]



Oil based suspension concentrate with B, Cu, Mn and Zn for fertilizer coating.

Product	Colour	Form
YaraVita [®] PROCOTE [™] Cu	Red/Brown	Oil-based liquid suspension
YaraVita [®] PROCOTE [™] Mn	Light Blue	Oil-based liquid suspension
YaraVita [®] PROCOTE [™] B	Blue	Oil-based liquid suspension
YaraVita [®] PROCOTE [™] Zn	Light Blue	Oil-based liquid suspension
YaraVita [®] PROCOTE [™] BMZ	Beige	Oil-based liquid suspension
YaraVita [®] PROCOTE [™] BCMZ	Brown	Oil-based liquid suspension



The information provided is accurate to the best of Yara's knowledge and belief. Any recommendations are meant as a guide and must be adapted to suit local conditions.

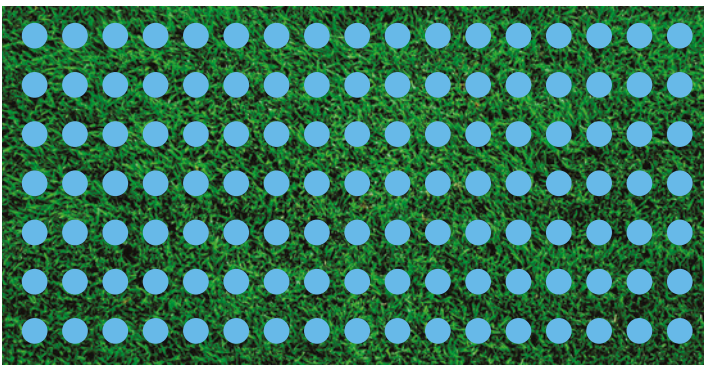
Feed the plant and not the soil

YaraVita PROCOTE supplies micronutrients on all fertilizer particles to ensure micronutrients come into contact with all turfgrass roots. Healthy turf consists of many

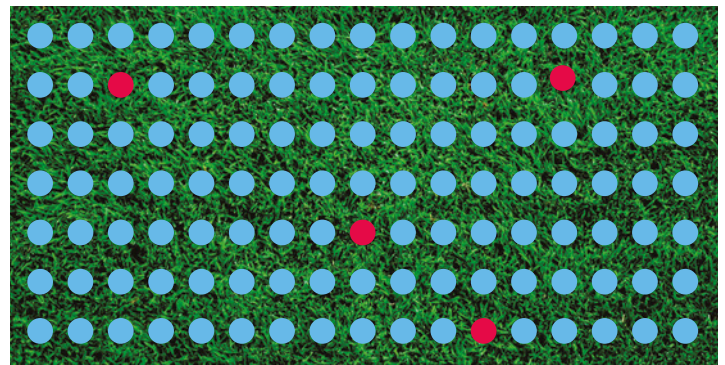
individual plants making it difficult to supply micronutrients by using blended fertilizers. YaraVita PROCOTE is coated onto each particle allowing the plant to come in contact with the right amount of micronutrients for sustaining turf at full growth potential.

Benefits

- Superior micronutrient delivery system.
- All nutrients supplied on each particle making it homogeneous.
- Prevents waste and eliminates dust.
- Efficiently feeds turf for producing consistent and healthy turf growth.



Fertilizer coated with YaraVita PROCOTE provides micronutrients on all particles, therefore enhancing uptake potential.



Typical micronutrient blend with spatial separation of micronutrients represented by the red dots; this is clearly not an efficient way to deliver micronutrients to all of the individual plants.





Knowledge grows

Sample Nutritional Program

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crop Stage	Transition Period		Root Growth and Establishment			Maintaining a Healthy Canopy		Building Healthy Turf and Preparing for Fall/Winter				
Lawn Care												
YaraVera® AMIDAS		22 lbs/A*		22 lbs/A*	22 lbs/A*	22 lbs/A*	22 lbs/A*	22 lbs/A*		22 lbs/A*	22 lbs/A*	
YaraMila® TURF ROYALE			207 lbs/A						207 lbs/A			
YaraVita® PROCOTE Fertilizer Coatings			1 gal/ton**						1 gal/ton**			
YaraVita® FOLIAR		-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A
Golf												
YaraVera® AMIDAS		22 lbs/A*		22 lbs/A*	22 lbs/A*		22 lbs/A*	22 lbs/A*		22 lbs/A*	22 lbs/A*	
YaraMila® TURF ROYALE			207 lbs/A			207 lbs/A			207 lbs/A			
YaraVita® PROCOTE Fertilizer Coatings			1 gal/ton**			1 gal/ton**			1 gal/ton**			
YaraVita® FOLIAR		-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A	-3-4 Products @ .5-1 gal/A

*22lbs/A is meant to be solubilized for applying through sprayer

** Based on micronutrient needs; add to Granular base application

YaraVita® product combinations determined by plant nutritional needs

These are only sample lawn and golf programs that are based on general growing conditions. Please visit www.yara.us and select turf solutions for more information on products and building programs. The website also allows access to use the OptimumTurf calculator for dialing-in exact turf needs.

Bermudagrass Grow-in Program

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
YaraMila® TURF ROYALE 21-7-14 5.15 0.75-1 pounds N/1000 sq.ft.	YaraLiva® TROPICOTE 15.5-0-0 19Ca 0.75-1 pounds N/1000 sq.ft.	YaraMila® TURF ROYALE 21-7-14 5.15 0.75-1 pounds N/1000 sq.ft.	YaraMila® TURF ROYALE 21-7-14 5.15 0.75-1 pounds N/1000 sq.ft.	YaraLiva® TROPICOTE 15.5-0-0 19Ca 0.75-1 pounds N/1000 sq.ft.	YaraMila® TURF ROYALE 21-7-14 5.15 0.75-1 pounds N/1000 sq.ft.	YaraMila® TURF ROYALE 21-7-14 5.15 0.75-1 pounds N/1000 sq.ft.
Apply organic base fertilizer of choice						

*Its recommended to use YaraMila 21-7-14 minis on golfing green grow-in projects.

Custom Nutritional Program

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crop Stage	Transition Period			Root Growth and Establishment			Maintaining a Healthy Canopy			Building Healthy Turf and Preparing for Fall/Winter		
Lawn Care												
YaraVera® AMIDAS												
YaraMila® TURF ROYALE												
YaraVita® PROCOTE Fertilizer Coatings												
YaraVita® FOLIAR												
Golf												
YaraVera® AMIDAS												
YaraMila® TURF ROYALE												
YaraVita® PROCOTE Fertilizer Coatings												
YaraVita® FOLIAR												

YaraVita® Combinations and use rates should be determined by plant nutritional needs, visit Yara.us turf solutions for more details.

These are only sample lawn and golf programs that are based on general growing conditions. Please visit www.yara.us and select turf solutions for more information on products and building programs. The website also allows access to use the OptimumTurf calculator for dialing-in exact turf needs.

Knowledge Grows

Megalab™

An Internet based, secure system offering interpretation and biometric data services, operating through a network of partner labs.

Analysis is an effective way of judging the amount of nutrients required so that over application does not occur, helping the environment as well as being economically useful to the turfgrass manager. Application of the correct amount of nutrient at the correct timings leads to good yield results despite reduction in application.

Developed since 1990, the system operates 365 days a year, 24 hours a day reporting product recommendations into the field for Yara customers globally.

The Megalab™ service:

- Fast and accurate results via web or e-mail
- Complete reports on the crop nutritional status
- Crop program recommendations tailor made on specific crop needs

optimumturf ™ Calculator

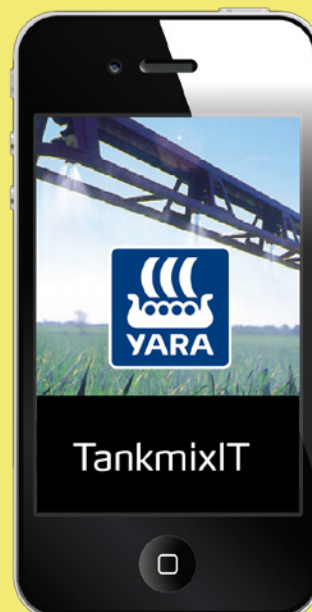
The OptimumTurf Calculator located at www.yara.us/crop-nutrition/turf/calculator is a perfect tool for developing customized programs, designed to help you build a turf program that fits site conditions based on your turf's current needs, while optimizing plant health and playability standards.

Toggle through the various Yara Optimumturf products by adjusting rates and determining the nutrient output needed to supply to your turf.

TankmixIT™

Yara TankmixIT is a downloadable app that is used to check the physical compatibility of YaraVita micronutrients when mixed with many common crop pesticides. TankmixIT allows better planning of spray programs and spraying opportunities with most of the YaraVita range. Each tank mix test is carried out under controlled conditions in our product development laboratories following BS EN ISO 9001:2000 guidelines and represents an accurate assessment of the physical compatibility of each mixture made.

Of course, there are many variables that affect tank mixes under field conditions that can influence the mixability of any mixture made. Yara TankmixIT is just a guide, not a guarantee of either physical or biological compatibility.



Download TankmixIT for free from your app store.





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