

Spring is the time to initiate new growth for turfgrass, and for many managers, it's the time to get some needed nutrition back to lazy turf.

After winter dormancy, both warm- and cool-season turf begins an important period of growth. For northern turf, spring and fall represent the peak seasons for shoot and

reach between 75 and 90 degrees F. Nutritional programs often coincide with these peaks.

Nature alone helps stimulate spring green-up, but most turfgrasses need additional fertilization to achieve maximum growth potential. Spring fertilization is especially critical on recreational turf areas, such as soccer fields which receive intense traffic from increasing play each season. Without additional fertilization they often become severely worn and weed-infested.

To get turf started

For cool-season turf, "starter type" formulations are popular choices. These products supply nitrogen, phosphorous and potassium in ratios which are desirable for spring shoot and root growth. Unlike high nitrogen formulations which promote

Fertilization & nutrition: a varied arsenal

Most turfgrasses need additional fertilization to achieve maximum growth potential.

by JOHN ROBERTS, Ph.D.

root development, when temperatures range between 50 degrees and 75 degrees F.

Root initiation occurs first in early spring, when soils begin to thaw. Active shoot development follows, as temperatures climb between 60 and 75 degrees F.

For warm-season turf, late spring through summer represents the optimum time for development, as temperatures

mostly topgrowth, starter types contain higher proportions of phosphorous (i.e., a 1:2:1 ratio).

The added phosphorous helps initiate root development and early turf establishment of new seedlings.

Go easy on nitrogen

Nitrogen is the most important element in a turfgrass fertilization program. However, there are limits to its use.

When turfgrasses are over-fertilized with spring N, excessive topgrowth—which requires extra mowing—and shallow rooting will result.

There is also a greater threat of nitrate leaching, a higher incidence of disease and reduced environmental stress tolerance, including summer drought.

In most situations, avoid applications of more than one pound of N/1000 sq. ft. when using "fast release" or highly water soluble nitrogen.

Fall fertilization benefits are obvious.





One of the author's key concerns is field errors that can result in misapplication, such as this fertilizer spill.

When using only fast-release nitrogen sources, light applications, $\frac{1}{8}$ to $\frac{1}{2}$ pounds of N/1000 sq. ft., are more desirable, and should be applied more frequently.

This spoon-feeding approach has become increasingly popular on golf course putting greens.

Fast-release/slow-release

A widely used strategy in the spring is to fertilize with products that have a combination of fast- and slow-release nitrogen sources. Fast-release nitrogen stimulates earlier green-up and growth which is often sought in recreational and landscaped settings. Slow-release nitrogen sources, whether synthetic or natural organic, last

eight to 15 weeks, and are less likely to burn the turf and release nitrogen more uniformly than inorganic N sources.

Turf managers often must strike a balance between which combinations to use in each situation.

Sometimes this requires supplementing small amounts of fast-release nitrogen into the spring application.

Late/dormant application an alternative

A late fall or dormant fertilization can provide a successful alternative to an early spring application. This strategy is primarily used by athletic field managers to:

- ▶ accelerate spring green-up and growth;
- ▶ help distribute the workload more evenly over the year;
- ▶ avoid traffic damage to soft, wet turf.

One major concern with late fall fertilization is the increased potential of nitrate leaching during the winter. Using lighter rates of slow-release nitrogen will help reduce this threat. However, this strategy will generally be slower to stimulate growth in cold spring soils.

pH affects nutrient availability

The soil pH has a considerable influence on the availability of most nutrients. Phosphorous is an example of a nutrient that is most available when the soil pH is between 6.0 and 7.0. However, in highly acidic soils with pH of less than 5.0, phosphorous gets "tied up" with iron and aluminum to form complexes which are unavailable to turfgrasses.

Maintaining near neutral soil pH values also favors the activity of beneficial soil microorganisms, the release of nitrate from nitrogen fertilizers and more vigorous growth of most turfgrasses.

In highly acidic soils, toxic concentrations of aluminum, iron and manganese may develop and cause impaired rooting (roots will appear short, brown and spindly) a decrease in overall

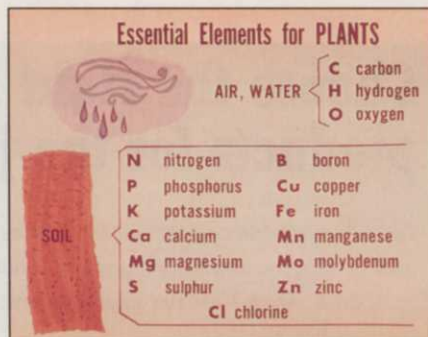
turf vigor, shoot growth, drought tolerance and recuperative potential.

Keep potassium levels high

Potassium plays a vital role in plant nutrition, and deserves more attention in many fertility programs.

Research has shown how important it is to keep potassium levels high during the growing season. Potassium is known to enhance turf tolerance to various environmental and biological stresses, including cold, traffic, disease and drought tolerance.

A nitrogen to potassium ratio of 3:2 has generally been considered desirable. How-



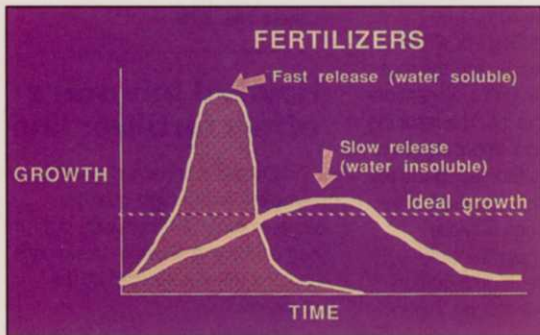
Essential elements for plants combine macro-nutrients with micro-nutrients.

ever, higher potassium ratios to nitrogen, such as 1:1 or 1:2 have improved stress tolerance in some investigations, even when soil tests indicate potassium levels are adequate.

Potassium is highly water soluble and subject to rapid leaching both within the leaf tissues and in soils with low cation exchange capacity. Potassium deficiencies can occur just a few days following a fertilization, especially on intensely managed, irrigated turf growing in sandy soils.

Light, frequent potassium applications with slow-release carriers helps to reduce potassium leaching in these situations.

The author is an extension specialist in turf science at the University of New Hampshire.



Fast-release nitrogen stimulates earlier green-up and growth which recreational and landscaped settings often need. Slow-release nitrogen sources, whether synthetic or natural organic, last eight to 15 weeks.

Fertilization & Nutrition products cont. on next page

Fertilization & Nutrition products

High performance golf fertilizers

The Andersons' Early Order Discount Program is in gear and now is the time to save on Tee Time products for golf course turf.

- ▶ Tee Time 16-4-8 with ammonium sulfate;
- ▶ 5-5-25 with Dimension;
- ▶ 21-3-16 and 18-6-15 Greens Grade;
- ▶ 25-5-15 with SCU;
- ▶ 14-0-24 Fairway Grade;
- ▶ 10-3-10 with Nutralene and Dithiopyr.

Call 1-800-225-ANDY or

Circle No. 274

Choose the right fertilizer products for the job

Quickly-available or water soluble sources provide a rapid growth response under good growing conditions and include:

- 1. Urea**, which is a water soluble organic compound that contains 45% N.
- 2. Inorganic salts** such as ammonium nitrate, ammonium sulfate, potassium nitrate, calcium nitrate and ammonium phosphates.
- 3. Methylol ureas**, formed by reacting urea with formaldehyde have produced growth responses similar to other water soluble sources but vary based on formulation. Examples of such products include:
 - ▶ **Form-U-Sol**, which has 28 percent N, of which 67 percent is urea and 33 percent is methylol urea;

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'Extraordinary' green-up, says company

Emerald Isle has environmentally safe, scientifically proven biostimulants, soil amendments, fertilizers, micronutrients and bioaugmentation materials that significantly improve turfgrass.

For extraordinary, sustained greening, the company developed SeaQuential, a multiple chelate iron

and micronutrient formula. With OptiMil, they engineered what they say is the first combined organic amendment and fertilizer to enhance fertilizer efficiency and agronomic performance in high-sand-topdressing regimes.

For more information, call 800-628-GROW and mention LM, or **Circle No. 275**

Essential soil amendment contains carbon

Essential soil amendment and biostimulant contains concentrate carbon that decomposes, supplying renewed organic matter. Essential feeds microbes and supplies nutrients to the turf.

The product has 7 percent active humic acid in an agronomically correct ratio to kelp, plus 24 amino acids, sugars, carbohydrates and natural sequestrants. A money-back guarantee is provided. Contact Essential at 800/648-7626 and say you saw it in LM, or **Circle No. 276**

Green-Relief Beneficial Microbes

Green-Relief has a no-risk 90-day challenge for testing its Green-Relief program on your golf course. Green-Relief Beneficial Microbes are now known as the leading non-toxic course-conditioning product, according to the company.

Green-Relief Beneficial Microbes move rapidly into the root zone, forming a symbiotic relationship with plant roots. The resulting microbial network improves plant performance by facilitating the uptake of nutrients and water while aiding in pathogen defense.

Other advantages include a 50 percent faster seed germination rate, deeper root growth, higher tolerance for heat, cold and physical stress and, a 25 percent reduction in seed rates. Call 800/788-9886 or **Circle No. 277**

Avoid burn with potash product

Sulfate of Potash from Great Salt Lake Minerals Corp. can be used during the hottest months to provide potassium and sulfur without fear of damage to the turf. Use of Sulfate of Potash also results in better rooting, drought resistance, heat and cold tolerance and better wear resistance. Increased grass response to nitrogen, phosphate and other nutrients is also provided.

Other benefits cited are disease resistance qualities for Fusarium Patch, Ophiobolus Patch, Dollar Spot Fungus and Powdery Mildew. Poa Annua can also be suppressed. To find out more, call 913/344-9302 and mention you saw this item in *LANDSCAPE MANAGEMENT*, or **Circle No. 278**

20 solutions from Growth Products

Growth Products offers a line of 20 liquid fertilizers and and micronutrients following 20 years of research and developments in polymer chemistry. The company prides itself on offering the highest levels of consistency and accuracy.

Landscape managers are able to avoid salts, chlorides and excess sulfur when using materials from Growth Products, according to the company. For more information and a sample call 800/648-7626 and mention LM or **Circle No. 279**

Howard Johnson's offers fertilizer line

Howard Johnson's is offering a complete line of high-quality, water-soluble fertilizers with poly-bag packaging. Custom blending is another service provided by the company.

Materials are available in variations that include high phosphorous, no phosphorous, acidity, "triple 20," starter food, tropical food, bloom food and foliar food. Call 800/298-4656 or **Circle No. 280**

Fertilization & Nutrition products

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Lebanon hones distribution network

Lebanon Turf Products is aiming at providing the best customer service by developing the industry's largest distribution network. The company has more than 70 local independent distributors nationwide.

Lebanon says that customers can always count on right-on-time deliveries and elimination of the guess work frequently encountered by landscape managers seeking application materials. For more infor-

mation around sensitive environmental areas such as wetlands, streams and lakes.

Circle No. 282

Nitroform has controlled release

Nitroform provides more than 90 percent controlled release nitrogen for sustained and predictable feeding all season long. The consistent release pattern is not dependent on coating or particle size.

Nitroform's energy-rich carbon and its nitrogen promote increased microbial activity—even in low organic soils, according to the company. The product resists leaching in sandy soils. For more information, call 888/764-1988 and mention LM or

Circle No. 283

Turf Cocktail for golf courses

Turf Cocktail is being cited as a 100 percent environmentally safe organic fertilizer and biostimulant. It is made from whole Atlantic fish, natural sugar and plant protein extracts.

According to Northeast Organics Inc., the product is proven to stimulate and support beneficial soil microbes and increase antioxidant activity. It also is effective in enhancing color by turning on chlorophyllase. Distributor inquiries are invited. Say you saw it listed in *LANDSCAPE MANAGEMENT* when calling 800/924-7347, or

Circle No. 284

Morrall introduces Green Effects

Morrall is introducing a new line of fertilizers and pesticides known as Green Effects. The company strives to provide innovation, quality and service.

The line has six product groups, which includes products for tree and shrub care, professional turf managers, golf courses, private labeling and ice melting materials. For more information call 800/554-3981 and mention you saw this no-

tice in LM, or
Circle No. 285

Calcium corrector on market

Quelant-Ca is a newly available amino acid, chelated calcium product that corrects calcium deficiencies in turfgrass.

The product is normally applied as a foliar spray and may also be applied through fertigation. It is tank-mix compatible with herbicides, soluble fertilizers, insecticides, fungicides and plant growth regulators.

Contact Nutramax labs Inc. at 800/925-5187 and say you saw it in LM, or

Circle No. 286

Green-T helps turf management

Green-T liquid fertilizer formulations contain an advanced new controlled release nitrogen source designed to enhance the health, appearance and color of turf.

One feature of Green-T is its clear liquid form, making it easier to measure and mix with water and compatible pesticides. The product does not readily leach or volatilize. Mention *LANDSCAPE MANAGEMENT* when you call 800/562-1291 or

Circle No. 287

Plant Health Care branches out

Plant Health Care Inc. is marketing products aimed at tree and shrub care, lawn maintenance and seeding and sodding. The line includes wetting agents, biostimulants, inoculants and hydrogels.

The IronPak biostimulant corrects iron deficiencies in grasses and ornamental plants. Call the company at 800/421-9051, or

Circle No. 288

A 3-dimensional approach

A 3-dimensional approach to turfgrass nutrition is being offered

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► **CoRon** is 28 percent N, has 50 percent urea and 50 percent methylol urea. It is an aqueous solution and its release is dependent upon microbial activity, but due to the relatively high urea content, it has shown to be effective in cool-seasons on turf-grasses.

► **Nitro-26**, which is 26 percent N with 30 percent urea and 70 percent methylol urea.

Slowly-available, slow-release or water insoluble sources are released based on manufacturing processes. These include:

1. Urea formaldehyde (UF): Also called Nitroform, Ureaform, Blue-Chip, etc. Contains 38 percent N. Nitrogen release is based on activity index of various forms of water-insoluble nitrogen (WIN)

2. FLUF is a flowable form of UF that contains about 18 percent N, of which 20-25 percent is water insoluble and thus has less burn potential than soluble sources.

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mation, contact Lebanon at 800/233-0628 and mention *LANDSCAPE MANAGEMENT* or
Circle No. 281

Nature Safe uses plant/animal meals

Nature Safe is a blend of various plant and animal meals that are balanced in sugars, starches, carbohydrates, proteins and fats. These meals contain essential natural amino acids, chelated secondary elements, vitamins and enzymes.

According to the company, Nature Safe has minimal leaching and volatilization and is ideal for applica-

Fertilization & Nutrition products

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by the Plant-Wise Biostimulant Co. as it presents its 3D plant growth supplement concentrate.

3D is a special blend of fortified seaweed extracts, concentrated humic acid and readily available micronutrients designed to provide foliar enhancement, physiological integrity and foundation fortification.

For more information, contact the company—saying you saw it in LM—at 800/334-4962, or

Circle No. 289

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3. Nutralene is a methylene urea product with about 40 percent N.

4. Isbutlydene diurea, also called IBDU, contains 31 percent N. Its rate of N release is dependent upon the hydrolysis of the product.

Coated N sources are made by coating urea or complete fertilizer prills with an impermeable or semipermeable coating.

1. Sulfur-coated Urea (SCU) is produced taking prilled urea and spraying it with molten sulfur.

2. Polymer-coated Urea (PCU) products are coated with some type of plastic polymer coatings to reduce the rate of N release.

Natural organic fertilizers include sewage sludges, composted manures and tan kages, hydrolyzed poultry feathers. Green-Relief is composed of a biostimulant growth complex with minor fertilizer elements and plant extract concentrate added.

Dr. Gil Landry, University of Georgia

Reliable Polyon fertilizers

According to the company, Pursell's Polyon fertilizers are the most reliable controlled release fertilizers to buy because temperature is the only factor that affects the release of nutrients.

Using a patented coating to guard against early release, the product gradually meters out the nutrients to ensure greener turf for a longer period of time.

For more information, call 800/334-8583 and report seeing Polyon in LM, or

Circle No. 290

Contec new from Scotts Company

The introduction of Contec controlled-release fertilizer in 1998 will offer more fertilizer flexibility for turf managers than ever before. Contec is the new complete line of homogenous methylene urea turf fertilizers from The Scotts Company. Contec "Premium," Contec "High Performance" and Contec "Complete Course" provide turf managers a methylene urea that will respond in the cool spring and late fall. Contec will also provide a superior summer fertilizer that will give turf managers excellent results without worrying about burning or foot-printing. Contec has a smaller particle size, more uniform granule, and more particles per square inch, to provide the best coverage, no matter how low turf is mowed. For more information on Contec, call 1-800-543-0006, and mention LM, or

Circle No. 290

Bolster growth with Sustane

The Bolster plant growth supplement from Sustane Corp. comes in water soluble packaging and is also available in liquid form.

The line's products are specifically developed for increased growth under sub-optimal and stress conditions. Be sure to mention LM if you call the company at 800/352-9245, or

Circle No. 291

GoldCote precious for fertilizer

Terra's GoldCote polymer technology delivers an exact controlled release fertilizer function that heeds temperature conditions.

As soil temperature increases, water vapor from the soil passes through the multiple coatings. The resulting condensation and pressure within the fertilizer granule causes a precise and predictable release of nutrients, according to the company.

For more information, tell Terra that you read about it in LM when calling 800/288-7353 or

Circle No. 292

firstTurf Liquid Fertilizers

Tessenderlo Kerley is introducing its firstTurf line of premium liquid fertilizers for turf professionals. The line is made up of the company's N-Sure products that improve nitrogen absorption, increase plant vigor and eliminate burn. Also provided is lasting green with fewer clippings.

To learn more call 800/525-2803 (mention that you saw it in LM) or

Circle No. 293

ESN provides precision nitrogen

Recognizing that climates are different throughout the United States, ESN precision controlled nitrogen from United Horticultural Supply is custom formulated for maximum performance in each of the U.S. climate zones.

According to the company, the steady, predictable release characteristics of ESN result in high quality green turf based on a patented process.

For more information, call 800/847-6417 and note that you saw ESN in LM, or

Circle No. 294

MultiCote controls release

MultiCote from Vicksburg Chemical Corp. is composed of three different high-quality polymer coated fertilizer granules. Soil temperature determines the release rates of the nutrients that provide a constant source of superior turf, according to the company.

For more information, LM readers can call 800/227-2798, or

Circle No. 295 LM