Becoming a Smarter and Better Manager of Phosphorus Nutrition:

A Strategic Imperative for Today's Professional Turf Managers; A Key Indicator of Agronomic Competence

Phosphorus: The Workhorse of Biological Energy Production

Phosphorus is the workhorse of biological energy production in plants. Phosphorus is involved in all of the energy transformations that occur in plants. It's required to make DNA and RNA and it's essential for strong plant membranes. It's vital to the physiological fitness and stress survival potential of intensively-maintained turfgrasses. Yet it is often stubbornly bound and unavailable in the soil matrix.

Problems with Phosphorus:

Bioavailability

Because phosphorus is so reactive, phosphate fertilizers get tied-up easily in soils. And phosphorus becomes unavailable for uptake by plant roots. Historically, professional turf managers applied 25 - 50% more phosphate fertilizers than needed to compensate for phosphorus unavailability. That's no longer possible in today's regulatory climate.

More Regulatory Scrutiny, More Phosphorus Restrictions

Phosphorus is under increasing regulatory scrutiny because of its powerful effect on biological growth. When phosphorus runoff enters bodies of water, algae grow quickly and adversely affect water quality. State by state, the amount of phosphorus turf managers are allowed to use is being limited. Clearly, in the future, it's going to become even more limited.

NuRelease®—
The Proven Solution

To Release Unavailable Phosphorus, Calcium, Iron, Magnesium, Manganese and Zinc

NuRelease Lets You Lower Phosphorus Inputs Without Lowering Quality

Better For The Environment

Better For Your Budget

Becoming a Smarter and Better Manager of Phosphorus Nutrition

Smart managers use resources intelligently…especially those they already own. Most golf course superintendents and athletic field managers have a significant reservoir of unavailable but potentially available phosphorus in their rootzones.

The smart solution is to "mine" more of what you already own. NuRelease® helps you do that better, faster and more cost effectively than any other single product on the market.

Introducing NuRelease® The Breakthrough Biocatalyst For Phosphorus…And A Whole Lot More

NuRelease is an innovative nutrient release additive and soil treatment. It's formulated to maximize nutrient availability and uptake efficiency in rootzones when watered in as a soil treatment. NuRelease is a unique blend of proprietary, naturally occurring organic acids. Extensive research has confirmed that NuRelease not only makes soil-bound phosphorus available, but also makes other essential nutrients like the divalent cations calcium, iron, magnesium, manganese and zinc more bioavailable.

In addition to a soil treatment, NuRelease can also be used as a performance enhancing tank mix additive with foliar fertilizers, biostimulants, PGR's and other plant protection materials. It helps to maximize photosynthetic efficiency, respiratory efficiency and stress tolerance in turfgrass plants.

For those professional turf managers who don't have a reservoir of potentially available soil bound phosphorus and must apply additional phosphate fertilizers, the smart solution is to also apply NuRelease. It will minimize the binding of applied phosphorus in the soil thus maximizing the availability of not

only phosphorus but also calcium, iron, magnesium, manganese and zinc.

Proactive golf course superintendents and athletic field managers are looking for ways to maximize phosphorus efficacy and efficiency and minimize its negative environmental impact. With NuRelease, those goals are realistic and obtainable. NuRelease is efficient, economical and easy to integrate into any program. And when you do, this is what you can expect:

- Dramatically better release and availability of phosphorus, calcium, iron, magnesium, manganese and zinc.
- Significantly better turfgrass response at cooler temperatures.
- The quality, color and density of the turf you manage will improve.
- You can apply 20 – 40% less Phosphorus.
- You will significantly lower the risk of phosphorus runoff and groundwater contamination.

In areas where there are concerns about phosphate pollution, the use of NuRelease to release soil phosphorus is an excellent option since soil phosphate release can be regulated by incremental applications of NuRelease throughout the season.

NuRelease Works When Other Biofertility Products Don't

A lot of variables such as pH, temperature, moisture level and microbiological activity influence the availability of phosphorus in the rhizosphere, rootzone and soil. Not surprisingly, a wide variety of products have been developed to improve the availability of tied-up phosphorus and prevent newly applied phosphate fertilizers from becoming locked-up and unavailable.

Soil and seed inoculants have been developed, for example, that introduce naturally occurring microorganisms into the growing medium. These microorganisms in turn release organic compounds like carboxylic acids that break the bonds of tied-up P, thus making phosphorus more available to plant roots. Ocean Organics has taken a different and more direct approach based on years of research. We skip the intermediate step. Using fermentation technology, we biologically produce the organic compounds that convert unavailable soil bound phosphorus to plant available phosphorus. When NuRelease is applied, the end result is a much more rapid response and much greater control over phosphorus nutrition.

NuRelease Works When Soil Temperatures Are Cold

When temperatures in the rootzone are too cool for sufficient microbial activity, soil and seed inoculants generally don't work very well. Their efficacy depends upon warmer soil temperatures to stimulate microorganisms to produce the organic acids that release tied-up phosphorus. NuRelease works well when soil temperatures are cool. As soon as it's watered in it starts working to make nutrients available.

NuRelease Works When You Need It To Work

Spring is the most critical time of the year for most golf course superintendents. Repairing winter damage usually requires extensive seeding, sprigging and sodding. Root development and therefore, root uptake capacity are at their maximum potential. That's why it's critical that all essential major, secondary and minor nutrients be present and available in rootzones to maximize your turf's physiological fitness prior to summer heat and drought stress. Using NuRelease to solubilize nutrients and make them more bioavailable for root uptake is a smart strategic step in the spring and again in the fall when root uptake potential is at its peak but nutrient availability in the rootzone is not.

The BioScience Behind NuRelease (Nutrient Release) Technology – Imitating Nature

NuRelease is a formulation of diverse, proprietary, naturally-occurring organic acids. In nature, some of these organic acids are produced by plant roots and secreted into the rhizosphere and rootzone in order to solubilize minerals and make nutrients available in the soil water for root uptake. Others are based on the by-products of bacteria, fungi (including mycorrhizae) and other rhizosphere microorganisms that sequester minerals and make nutrients available in the soil. One of the many unique features of NuRelease Nutrient Release Technology is the inclusion of organic acids that mimic exudates generated by plant roots and soil microbes at cooler soil temperatures.

In order for microbes to be successful in making phosphate, calcium, iron, magnesium, manganese and zinc available, a nutrient source must be available. The nutrient source usually comes from the associated plant. Its abundance is dependent on the growth rate of the plant and the excess sugars secreted by its roots to provide energy for the microbes.

However, a young turfgrass seedling starting out in a cold soil, for example, does not secrete enough sugars to support microbial activity in its rhizosphere. Neither does a mature turfgrass plant like bentgrass when it's emerging from dormancy.

Since early season soil temperatures do not lend themselves to much microbial activity, the solubility of phosphate, in particular in cold soils, is very low. As a result both seedlings and mature turfgrass plants get off to a slow start and often experience early nutritional stress, as a result of phosphorus deficiency. NuRelease solves this problem.

NuRelease's superior performance in cool soils is an important advantage. It gives golf course superintendents a new tactical weapon in their struggle to help their more desirable grasses, like bentgrasses, outcompete poa annua in spring and fall when cool soil temperatures favor poa. Since poa is so much better at scavenging phosphorus in cool soils, it has a significant competitive advantage in the spring and fall. NuRelease can help put your bents on an "even playing field" with poa.

NuRelease®
A Key Component In Any High-Performance Turfgrass Nutrition and Fitness Program

NuRelease Works When Other Products Don't

NuRelease will work in any soil to unlock sequestered nutrients. Use NuRelease as a soil treatment to maximize nutrient availability and root uptake efficiency in your rootzones and rhizospheres…

- In high phosphate soils (to release soil-bound phosphorus and to release phosphate-bound calcium, iron, magnesium, manganese and zinc, and make them all more available).
- In low phosphate soils (to increase release and availability of added phosphate).
- In high pH alkaline and calcareous soils (to make P, Ca, Fe, Mg, Mn and Zn more bioavailable).
- In low pH and tropical soils to overcome nutrient deficiencies such as those induced by aluminum toxicity.
- In all cool soils.

To aid in root and foliar uptake, and facilitate transport across cell membranes into roots and leaves, use NuRelease as a performance enhancing additive in your:

- Granular, liquid and foliar fertility programs
- PGR programs
- Tank mixes (helps maintain stability and solubility of phosphates and other nutrients).

NuRelease Can Do More Than Any Other Product to Help You Best Accomplish Your Agronomic Goals

Applied as a soil treatment, NuRelease can help you maximize the performance potential of the rhizospheres, rootzones and soils you manage.

Applied as a performance enhancing tank mix additive with foliar fertilizers, biostimulants, and other commonly sprayed materials, NuRelease can help you get more of the genetic potential out of the turfgrasses you manage.

Contact us today for the name of your nearest Ocean Organics distributor. If there isn't one in your area, we'll be happy to do business directly.

Ocean Organics®

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