The Broad Benefits of Biostimulants

BY STEPHEN MIRANDA

Some people are a tough sell. They don't readily accept new products into their programs. For every active ingredient that touches their fields, they want to see extensive studies and proven results. If they don't have any biostimulant/soil amendment products in their programs, they might be surprised to find that these products-including kelp extracts, beneficial soil bacteria and humus as well as composted animal and plant materials-are among the most studied, data-extensive materials available for turf health management.

A biostimulant/soil amendment is a class of soil- and plant-growth-enhancing products that can:

- Enhance root and shoot development.
- Improve soil texture and structure.
- Increase the availability of macro- and micronutrients.
- Improve a plant's ability to recover from disease and insect damage.
- Enhance a plant's resistance to environmental stresses, such as heat, drought and high traffic.
- Improve the efficiency of any fertility program.
- Reduce the effects of pH and soil colloidal imbalances.

Biostimulants, in their raw form, have been used agronomically for hundreds of years. Native American Indians worked fish and composted plant and animal materials into their soils. Broken down into their components, these organic substances contain humus, amino acids, proteins, vitamins, carbohydrates and sugars, all materials that enhance the active biomass in the root zone and improve plant vitality. Because the overuse of chemical pesticides and fertilizers can negatively impact soil productivity, horticulturists now look to organic compounds to bring soils back into balance, improve plant health, and reduce the need for chemical intervention.

Active ingredients

The "bio-active ingredients" common to many biostimulants/soil amendments can be placed in the following categories:

Humus: Active humus, extracted from decomposed plant and animal organic matter, is composed largely of three organic acids-humic, ulmic and fulvic. These large organic molecules provide an excellent food source for beneficial soil microorganisms, help to improve soil structure, enhance soil water holding capacity and naturally chelate unavailable micronutrients.

Kelp Extracts: Extracts of North Atlantic kelp are excellent sources of plant growth hormones, including gibberellins, cytokinins, auxins, manitols, to name a few. These compounds affect turfgrass by promoting cell division and elongation, resulting in improved root depth, mass and density, thus increasing the plant's nutrient and water absorption capabilities.

Beneficial Soil Microorganisms: Naturally occurring soil microorganisms are nature's fertilizer producers. Nitrogen-fixing bacteria make atmospheric nitrogen available to the plant. Certain soil and rhizosphere bacteria produce enzymes that solubilize phosphorus and potassium from insoluble mineral sources. Other species produce a variety of chemicals, such as the plant growth hormones mentioned above that stimulate root and shoot growth. The numbers of bacteria species and their various roles are vast, but they provide multiple benefits to plant growth, overall soil productivity and disease suppression.

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Intermediate Metabolites: This category includes carbohydrates, peptides, simple and complex sugars, amino acids, lignin, organic mineral chelates and cellulose fiber. Derived from naturally fermented plant and animal solubles, these ingredients can provide an immediate source of energy for plants and soil microbes, help break up soil compaction and improve the soil's cation exchange capacity.

Optimized health and vigor

Biostimulant/soil amendment products can be perceived to be just another cost added to an already tight maintenance budget. One must realize that many of the variables that affect a plant's survivability lie below ground in the root system and surrounding soil. Sports turf, above all other turfgrasses, bears the brunt of high traffic. Turfgrass survivability is maximized anytime the entire root system and productivity of the surrounding soil can be enhanced. Biostimulants can be highly cost effective because they help reduce other costs. Water costs can be lowered as soils improve and become more porous. Fertilizer inputs might also be reduced as root systems become healthier and can absorb more nutrients.

Biostimulants/soil amendments, however, should never be considered as replacements for sound fertility and disease-management programs. Biostimulants optimize plant health and vigor, while allowing them to withstand and survive environmental and biological stresses, such as extreme temperatures, drought, traffic or fluctuations in soil fertility. It could be said that biostimulants are the turf managers' "insurance policy," but, in actuality, they are essential elements that show their true worth when something goes wrong.

The benefits biostimulants provide may not always be obvious, because most biostimulants affect belowground systems-the roots and soil ecosystem. Turfgrass managers who regularly use quality biostimulants/soil amendments can expect to see enhanced turf color, a general improvement in turf health and soils that better retain nutrients and moisture. But when the going gets tough, and the fields receive more play, turf managers should see vast improvements in turf wear and the ability of the turf to recover more quickly. When reseeding, biostimulant users should also experience greatly improved germination and faster establishment of new turf.

When looking for a biostimulant/soil amendment product, be sure to carefully read the product labels. Select only the products that clearly state active ingredients, their percentages, and the guaranteed minimum analysis. If there is a bacterial content, make sure the bacterial count or colony-forming units per gallon or pound are listed. Look for a well-rounded product. Biostimulants are still largely available in liquid form, but granular and dry soluble formulations are available. The pre-measured, water-soluble packets can be thrown directly into a spray tank for application.

Turf, soils and operating budgets will benefit if biostimulants are added to a management program. ST

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