THE FRONT OFFICE

OPINION PAGE

Dealing with Stress

Thanks to the "Applicator's Log" this issue, I think I understand better some of the "cutting edge technologies" that have been lumped under the term "biostimulant." The term's been applied both to true biostimulants (plant hormones) and to humic acids (which include plant hormone-like activity among their effects).

Although biostimulants and humic acids are non-nutritive substances, containing little N, P or K, they're worth a sports turf manager's consideration — especially biostimulants, according to Dr. Richard J. Cooper of North Carolina State University. At STMA's last conference, Dr. Cooper recommended biostimulants as a way to help sports turf during times of stress and noted that cool-season varieties respond especially well.

About humic acids, Dr. Cooper is not quite as enthusiastic. Most research showing the beneficial effects of humic acids has been on plants other than turfgrasses, so he cannot recommend humic acids as a definite help. Instead, he recommends that sports turf managers themselves test humic acids by buying a sample, treating an area and comparing it against an untreated area. If your results match up with a study Dr. Cooper conducted on Crenshaw bentgrass, you'll see a significant gain in root growth but little additional gain in shoot growth.

A third category of non-nutritive substances I've seen labeled "biostimulant" is microbes, nature's farmers. Thanks to new technology, microbes can be injected into the soil and have proven especially helpful in sand-based systems and other soils where they're deficient. Turf managers who've applied packaged microbes have seen fertilizer rates cut in half, longer roots and other "miracles."

At STMA's 1995 conference, Nick Spardy of the Wilbur-Ellis Company explained the five major functions of microbes. They:

1. Cycle Nutrients. Microbes convert complex organic compounds into simpler forms that plants can feed on.

2. Structure Soil. One waste product of bacteria is polysacharides, which bind soil particles together, creating pores for the retention and movement of air, water and nutrients and the prevention of black layer.

3. Suppress disease and pathogenic fungi. Bacteria do this three ways: antibiosis (production of antibiotics that kill pathogens), mycoparasitism (bacteria grow into fungi and feed on them till the fungi die), food competition (bacteria are more aggressive consumers of food in the environment, leaving many pathogenic agents to starve).

4. Stimulate Growth and Germination. Bacteria and fungi produce a variety of plant-growth hormones, such as cytokinins and auxins, that trigger roots and stems to grow and seeds to germinate. Bacteria also colonize and protect seeds from plant pathogens till seeds germinate.

5. Convert Toxins into Nontoxins. Microbes colonize roots and break down compounds toxic to a plant into simpler, nontoxic forms. For example, microbes buffer salts and keep them away from plants, resulting in minimum sodium uptake. Microbes also attack and reduce the levels of pesticides and other pollutants.

Under ideal circumstances, a turf manager can lay down a compost rich in microbes and let nature produce the cutting edge technologies grasses need. But sports turf managers rarely work under ideal circumstances, so hopefully the new human-made technologies can supply some relief.

TIP O' THE MONTH

Testing Compatibility of Pesticides

Pesticide handlers often like to combine two or more pesticides and apply them simultaneously to save time, labor and fuel. If the pesticide label fails to tell you or you cannot find a chart that lists the compatibility of two pesticides (or the pesticide and other chemical) that you wish to mix, test a small amount of the mixture before you mix large quantities. Here's how.

First, put on personal protective equipment. Wear at least the equipment required by the labeling of any of the pesticides to be combined.

Second, get a large, clean, clear glass container, such as a quart jar. Use the same water (or other diluent) that you will use when making up the larger mixture. Add the water and each of the products in the same proportions as you will mix them. Unless the pesticide labeling states otherwise, add pesticides to the diluent (usually water) using the "W-A-L-E" plan:

1. Add some of the diluent first.
2. Add **W**ettable and other powders and **W**ater-dispersible granules.
3. **A**gitate thoroughly and add the remaining diluent.
4. Add the **L**iquid products, such as solutions, surfactants and flowables.
5. Add **E**mulsifiable concentrates last.

Next, shake the jar vigorously. Feel the sides of the jar to determine if the mixture is giving off heat. If so, the mixture may be undergoing a chemical reaction and the pesticides should not be combined. Let the mixture stand for about 15 minutes and feel again for unusual heat.

If scum forms on the surface, if the mixture clumps, or if any solids settle to the bottom (except for wettable powders), the mixture probably is not compatible. Finally, if no signs of incompatibility appear, test the mixture on a small area of the surface where it is to be applied. ❑

The above tip comes from the book Applying Pesticides Correctly, *published by the Environmental Programs Office, University of Nebraska.*