



Satisfy the plant's demand

Build your fertility program on the basis of soil and tissue tests, and give your turfgrass the right amount of nutrients to allow it to perform as you would like

By WAYNE KUSSOW, Ph. D.

Aturfgrass plant does not act like a sponge. The roots of grass plants do not take up soil nutrients in solution the same way that a sponge absorbs water. A generation ago, many agronomists thought this was so, but they were mistaken. We've learned that the plant's processes are much more complicated and precise than that. This is significant as we build our turfgrass nutrition programs.

One of our goals as landscape managers is to provide the turfgrass in our care with enough nutrients to achieve the results that we desire, and no more. These results, among others, may include greener color, a denser stand to crowd out weeds or faster recovery from traffic injury in the case of turf for sports. Their order of importance may be different, of course, depending upon the types of grass that we manage and the uses to which they are put.

For instance, our fertility program

would be different for the turfgrass of a busy youth soccer field than for a corporate office park. The soccer field, subject to more traffic and stress, is likely to require more nutrition — indeed, a much different total management program — than the office park where the goal is primarily to provide curb appeal, as in a home lawn. Likewise, a program for a warm-season turf would be different than a program for a cool-season turf.

Whether we're developing a fertility program for athletic turf or a home lawn, or for warm- or cool-season turf, we don't want to use any more nutrients than we need for the results we desire. That would be a waste of material and labor. That's why, we must understand the basics of how a turfgrass plant selects the nutrients that it needs. And, remember, it doesn't withdraw them from the soil solution as in the model of a sponge.

In fact, research has shown that a turfgrass plant tightly controls what it takes up.

The plant will "shut off" the roots or "turn them on" when it needs nutrients. The shoot of the plant communicates with the roots through the use of hormones, nutrient ion gradients and other plant processes. The shoot, in effect, tells the roots, "I need more potassium," or "I don't need more potassium." The root responds accordingly.

Who's in charge?

What controls this process? Plant demand controls it.

And what causes plant demand? Shoot growth is primarily responsible for plant demand.

So how can we affect shoot growth? Primarily, we stimulate shoot growth with nitrogen (N).

It has long been shown that as we increase the N rate we increase, in linear fashion, turf shoot growth. We can measure this by comparing clipping weights. Turf growth will peak and level off at a rate of about 12 to 15 lbs. of N/1,000 sq. ft. annually. But, turfgrass is a unique "crop." Unlike most agricultural crops, we're not seeking maximum biomass. We're managing it for aesthetics such as color and density and, in the case of athletic fields, for durability and playability. Therefore, the amount of N we apply to turfgrass is substantially less than what we would apply to encourage peak growth.

Know your nutrients

Nitrogen is one of the three major nutrients responsible for plant growth and health. The others are phosphorus (P) and potassium (K). There is a tight relationship between the amount of nitrogen, phosphorus and potassium that a turfgrass plant will use.

The challenge for managers is to find the right combination of nutrients to satisfy the demands of the plants under their care. This is not as simple as picking up a bag of product and applying it, even though there

is essentially a constant ratio of nitrogen, phosphorus and potassium (N-P₂O₅-K₂O) in turf clippings, a ratio of 4-1-3.5

Does that mean you should always use a fertilizer with nutrients in those proportions? Of course not. Soil samples may indicate that the soil of the turf we are managing already contains sufficient phosphorus and potassium to meet the demands of the turfgrass. We can only know this by taking soil samples.

Playing with the numbers

If soil tests indicate that P and K levels are low, we should use a fertilizer with enough of each element to correct the deficiency to meet the plants' demands. If they are already sufficient in the soil we want to maintain these levels, and if they are high, there is no reason to add additional amounts since the plant won't use them.

We can, however, increase the turf's "demand" to use greater amounts of P or K, for instance when we're establishing turf or we're seeking rapid recovery of athletic turf, by stimulating shoot growth with additional nitrogen.

Anytime we change the N rate, we're going to alter the demand for P and K. We demonstrated this on turf plots to which we had applied 2, 4, and 8 lbs. N/1,000 sq. ft. respectively. We applied no additional phosphate or potash to the plots. After three years we recorded that the plots that had received 2 lbs. of N showed a 6 ppm reduction in soil phosphorus and a 25 ppm reduction in potassium, the plots receiving 4 lbs. N showed reductions of 10 ppm P and 37 ppm K, and the plots receiving 8 lbs. N recorded a 19 ppm drop in P and a 57 ppm drop in K.

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Wayne Kussow, Ph.D. is with the Dept. of Soil Science at the University of Wisconsin

NITROGEN CREATES DEMAND FOR PHOSPHORUS AND POTASSIUM

Clipping nutrients

Annual N lb./M	%N	%P	%K
2	3.8	0.42	2.4
4	4.3	0.44	2.5
8	5.2	0.48	2.9

THE FUTILITY OF APPLYING P AND K WHEN THERE IS NO DEMAND

Clipping nutrients

N-P-K Applied lb/M	%N	%P	%K
4-0-0	4.3	0.44	2.5
4-1-0	4.3	0.44	2.6
4-0-3	4.3	0.44	2.6
4-1-3	4.3	0.44	2.6

cont. on page 38

Set **your** company apart

Differentiate yourself from your competition by targeting consumers interested in environmentally friendly fertilization methods

By CHUCK PAULSON AND
MIKE ARCHER

It's relatively easy today to build turf programs capable of approaching perfection, at least for a while. But, even with customers' desire for high quality turf, there's also a desire for methods that are considered "environmentally friendly."

Many lawn care businesses are looking for ways to differentiate themselves from their competition in today's fast-paced world of new product development, and they are watching for opportunities in the area of turf management. One option is to focus on the

changes that follow in the wake of a maturing market and to take advantage of emerging opportunities for improving the quality of turf and the bottom line.

A new approach?

For many companies, an organically-based program is considered simply not feasible, and even a solid Integrated Pest Management (IPM) program has often been considered to be difficult to implement and sell. It can be difficult to explain the benefits to the clients and justify higher prices, compared to less expensive competitors.

Phil Catron of NaturaLawn of America, however, says that IPM is more than a program; it's philosophy and way of doing business. "It has to do with your decision-making process on whether you are treating the symptom or trying to solve the problem," he says, "and how you approach solving the problem through prevention, monitoring and control."

Continued progress in the area of IPM means new developments provide a proven range of effective active ingredients that reduce the impact they have on the environment. By bringing valid attention to a genuine desire to use safer products in reduced amounts, lawn care professionals can reduce the active ingredient load in the environment. This approach can be instrumental in gaining favor with the customer.

Fertilizer options

The basis of the lawn care programs of NaturaLawn of America are their organic-based fertilizers, blended by Spring Valley Turf Products. This is a good place to start in differentiating from the competition.

While NaturaLawn of America has its own

cont. on page 40



Phocus on Phosphorus

As a landscape or grounds manager, shouldn't you know the basics about the products you use? Take phosphorus, for instance. See how well you do on this quiz, based on an article written by Dr. Peter Landschoot, Penn State University.

1. Phosphorus is extremely important in:

- a. encouraging plant color
- b. rooting, cell division and synthesis of chemical compounds
- c. enhancing water takeup in the plant

2. Phosphorus cannot move from one portion of a plant to another

- a. true
- b. false

3. Turf that is deficient in phosphorus turns purple or red

- a. true
- b. false

4. Too much phosphorus may affect iron and zinc uptake

- a. true
- b. false

5. Phosphorus should be incorporated into the soil prior to seeding or sodding

- a. true
- b. false

6. Phosphorus can enter surface waters via erosion and runoff.

- a. true
- b. false

Answers:

1. B. Phosphorus (P) is extremely important in seedling development, rooting, cell division and the synthesis of various chemical compounds used by plants.

2. False. Phosphorus is available to turfgrasses as H_2PO_4 and HPO_4 and is mobile in plants — meaning that it can move from one portion of the plant to another.

3. True. Deficiencies of this nutrient in turf are usually expressed as purple- or red-colored leaf blades and as reduced growth and tillering.

4. True. Excessive P concentrations in plant tissue (greater than 1.0% on a dry weight basis) may have adverse effects on iron and zinc uptake and metabolism.

5. True. Phosphorus is largely immobile in soils — meaning that it takes a long time to move from the turf surface into the root zone. It may take months to move just a few inches in soil.

6. True. Although P is not readily leached from soils into ground water, recent surveys have shown that it can enter surface waters via erosion and runoff. Avoid applying P fertilizer where runoff is likely — such as on frozen soils and paved surfaces.

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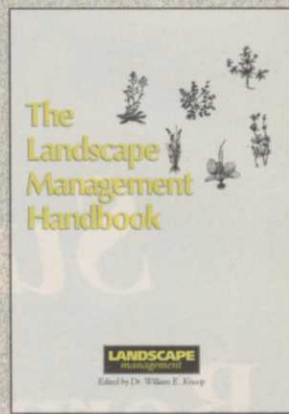
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cont. from page 38

specially blended products, which gives it the additional marketing tool of uniqueness, there is a range of products available to lawn care companies looking for a way to separate themselves from the pack. These include organic-based materials, a combination of natural-organic and synthetic-organic materials, which allows

for maximizing the benefits of fertilizer applications. Organic-based products can range from 25% organic material to 100% organic. Anything less than 100% is organic-based.

True, early organic products were often ineffective and costly when compared to the traditional approach. Many products

were dusty, possessed an offensive odor, had a limited shelf life or had use rates that were simply impractical for broadcast application. But now, some fertilizer formulators blend complete N-P-K fertilizers that contain both biological and traditional components. The customer's desire for high product quality, availability, competitive pricing and lower environmental impact are being met and often exceeded. To satisfy the needs of the turf professional,

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Field studies indicate that there is better interaction between nutrients, turfgrass and plant microbes in soils that have adequate organic matter.

manufacturers of these products must specify ingredients that blend well, do not degrade, are readily available and provide definite environmental benefits.

Here are the benefits

According to Catron, most fertilizers are designed to feed the turf. While this is necessary, feeding the soil is often overlooked. "It is old-fashioned agronomics. It is simply understanding plant nutrition and understanding that you're dealing with a soil environment that's full of organisms. And if you feed all these organisms, they, in turn, will feed the turfgrass."

Catron looks at it as an investment into the soil where you can get a healthier plant that "withstands disease and insect problems and reduces the overall use of any kind of controls, whether they're biological or synthetic."

Field studies indicate that there is better interaction between nutrients, turfgrass and plant microbes in soils that have adequate organic matter. As the nutrient program approaches this balance in the soil,

cont. on page 42

cont. from page 40

the quality and health of the turfgrass improves. Increased rooting and turf density reduce the reliance on pesticide use also.

Economic benefits?

The price difference between organic-based fertilizers and synthetic fertilizers has narrowed, but organic-based materials still tend to be more expensive. So can you justify a higher-priced product? Well, if a solid program means that you can reduce your use of other materials, the answer is yes.

Catron says that yearly comparative data at NaturaLawn of America data indicates that they use 80% less control materials than a traditional lawn care company, for weed and insect controls, and over 97% of the applications that they do make for insects are biologically based.

In addition, increases in earthworm populations, mixing of organic materials into the soil and decreases in thatch all contribute to the condition of the soil, and can only benefit the turf, which ultimately will impact the types and extents of treatments required.

How do you start?

Well, besides finding a supplier of organic-based products and updating your ad in the Yellow Pages, it is important to have a good understanding of the nutritional aspects of the turf you are dealing with.

Catron advises people to look down the road and see the long-term benefits. Changing your materials is an easy step, he says. The tough change is adapting your approach and training, and involving your employees to make good decisions and not to treat a disease symptom as soon as they see it. If you are building soil as well as turf, you want to give the soil organisms and insects a chance to do their job.

Chuck Paulson is the National Sales Director and Mike Archer is Product Manager for Spring Valley Turf Products, Jackson, WI.

Fertilization and nutrition products

Emerald Isle's GroWin rootzone biostimulant produces an additive response over and above fertilizers and amendments.

Recently concluded research verifies that GroWin builds larger, deeper, denser roots, increases foliar growth and improves stress tolerance. Applied to the top 4-6 inches of the rootzone before seeding, sodding or sprigging, GroWin reduces the need for nitrogen to produce response.

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For more information call 800/343-6343 or Circle No. 285

Howard Johnson's Enterprises launched its new line of products featuring HJCT-2, a patented coating process for nitrogen and potassium.

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Lange-Stegmann Co. offer a variety of products.

The products include Agricoturf II Stabilized Nitrogen, Polyon Polymer Coated Nutrients, Nutralene and Nitroform Nitrogen, as well as Sulfur Coated Urea and Super U. Lange-Stegmann will also be offering fertilizer products with Mach 2 Turf Insecticide Grub control in early 1999.

For more information call 800/279-9531 or Circle No. 287

Natural Fertilizer of America offers biologically-based soil treatments.

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Fertilizers are dry granulated fertilizer products made from aerobically composted turkey litter. Bolster plant growth supplements, formulated from seaweed, humic acids and plant nutrients, are available in liquid and water-soluble packets.

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Quelant-Ca is tank-mix compatible with herbicides, soluble fertilizers, insecticides, fungicides and plant growth regulators.

For more information call 800/925-5187, website www.nutrimaxlabs.com or Circle No. 289

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