



Natural Turf Management, Part 3



Frequent fertilization of the grass on the left developed high salt accumulations that killed grass roots and natural life-supporting soil reactions. Favorable, natural soil reactions of the grass on the right stimulated deep roots and soil microorganism activity. Photo courtesy: Don Arenberg.

Balancing Turf on a Budget

By Don Arenberg

The trend toward lowering costs by eliminating workers is nothing new. Businesses have been doing it for several years. Yes, the greatest cost reductions can be experienced by massive layoffs, but downsizing a groundskeeping staff to a few experienced personnel makes maintaining quality turfgrass difficult. Fortunately for sports turf managers there are ways of possibly saving money simply by modifying maintenance practices.

Under chemical care, turfgrass is unnaturally treated and must continue to receive artificial ingredients, unless changes are made to bring the plant back to its natural functions. By providing turfgrass its basic natural requirements, a turf manager can realize the following benefits:

- reduced weed growth and herbicide applications;
- slower rate of turfgrass growth while maintaining deep green color, beauty, density and health;
- reduced watering, mowing, trimming, fuel use and repair costs;
- an improved soil structure that reduces flooding, runoff and puddling;
- deeper, denser root growth;
- more attractive, playable turf, resulting in more income from play.

There are other benefits, but for now, I would like to focus on the ways people create unnecessary expenses. From the

following, one should not conclude that fertilizers are totally bad, only that they can be better used.

Single-Minded Management

Much has been said about fertilizers and their frequent use: "If you don't fertilize, your grass will not grow." But the result is more frequent mowing and trimming. Much has also been said about nitrogen in its various forms – quickly available, slowly available, combined with sulfur, liquid and granular – and that high rates of nitrogen are required to maintain continual uniform grass growth.

When the green color ceases, people then hear promotions for the micronutrients.

Almost every concept, product and ingredient has been promoted on an individual basis, and new products are continually introduced every year to the turfgrass market as individual cure-alls, but no one product or group of products has yet accomplished its original claims. Why? The answer is simple. No one product or ingredient can supply all of the needs of all turfgrass plants on all soil types on a long-term basis. The following illustrates the negative effects one ingredient or one group of ingredients can cause on grass and soil.

A Single Nutrient – Nitrogen

For the past 40-plus years, nitrogen has been promoted as the most important nutrient for growing turfgrass. Many different recommendations have been

made regarding the various available forms, application rates and frequencies. From these recommendations a "chemically acceptable standard" of one pound of nitrogen is often applied to 1,000 square feet of lawn per application. Nothing is said regarding the ratio of nitrogen that should be used with other nutrients.

Yet it is known that excessive rates of nitrogen will produce excessive leaf growth, meaning the grass will grow faster and require more water, more nutrients (other than nitrogen) and more frequent mowing. It all adds up to increased maintenance costs but a decrease in the health of the grass.

A primary technical damage caused by excess nitrogen or the use of nitrogen without regard to other nutrients is the development of "fat cells" with very thin cell walls. Thick-walled cells are one of the plant's main "armor" systems against disease, insects, wear, poor weather and other adversities. When thick cell walls are reduced to frail "tissue paper" thin walls, the plant loses its ability to fight off infections and heal its wounds.

A Group of Nutrients (N:P:K)

The primary nutrient elements of nitrogen, phosphorous and potassium in commercial fertilizers are derived basically from water soluble salts such as ammonium nitrate, ammonium sulfate,

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urea, ammonium phosphate, potassium chloride, muriate of potash and so forth. These fertilizers are high in salts and acid formers. When applied to the soil, the salts immediately kill root tips and essential soil microorganisms while changing the physical, chemical and biological characteristics of the soil. The fertilizers make the surface soil more acidic, creating desirable conditions for the invasion of disease and the gradual thinning of the turf, which encourages the growth of weeds.

Initially, fertilizers appear to encourage the growth of green grass. But over a period of years, the grass does not become stronger or more aggressive, nor do the roots grow deeper or the rhizomes and stolons more massive to produce a dense turf. Instead, the older a lawn becomes and the longer salty fertilizers are used, the thinner the roots become. The roots tend to grow more on the soil's surface while rhizomes and stolons fail to function properly. The grass becomes thin and weak while the soil becomes tight, compact and unable effectively to sup-

port the growth of the grass. Older lawns require frequent reseeding, resodding, pesticide applications, water, care and expense. The more fertilizers are applied, the faster and more complete the decline.

Balancing Act

No one nutrient or group of nutrients, no matter how well suited to the requirements of a specific grass, will provide all the elements for optimum growth. Many other ingredients and conditions must likewise be met. Among the more important are soil microorganisms, enzymes, hormones and organic compounds, plus acceptable physical, chemical and biological soil and environmental conditions. All of these must be correctly balanced to meet the requirements of the desired grass species. If they are not, the grass will not provide all the characteristic reactions necessary to meet the demands of people and their use of turfgrass.

For years, people have realized that a nutrient balance is necessary. Soil analysis emerged to test for the availability of fertilizer nutrients. Other tests were added for exchange capacity, organic

matter content, exchangeable hydrogen and so forth. But no matter how many nutrient tests were made, sufficient information was never accumulated to produce acceptable results. Too often neglected was the importance of how microbes live in the soil and what each does.

It is critical to know which microorganisms are necessary for each turfgrass species. If the wrong types are present, then changes must be made to support the ones necessary for the specific grass. It is not sufficient simply to add the missing microbes, as the soil will not support their growth. Rather, the soil must first be modified and balanced with nutrients, enzymes, hormones and other essentials to support the soil microbes - which in turn will provide the essentials for hardy grass growth.

This all may sound complex, but on a long-term basis, it is the most economical way to grow quality grass. □

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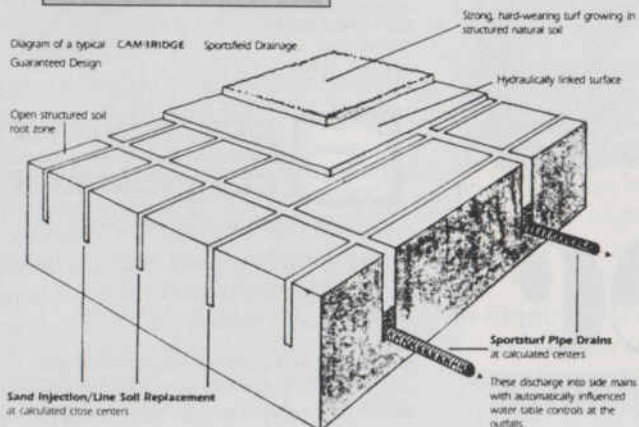
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