
CHEMICAL LOG

Quick-Release Fertilizers For Fast Green-Up

By Helen M. Stone

Dr. Alex Shigo, noted tree expert, often speaks about an industry-wide fallacy — that we can “feed” trees, shrubs, turf and other plants. In reality, plants manufacture their own food through photosynthesis. Elements from the air, water and soil are combined and altered in order to provide the starches plants use for energy and growth. Therefore, we cannot feed a plant.

What we can do is provide all the essential elements a plant needs in order to manufacture its food. The warm temperatures of springtime bring a flush of growth that can deplete a plant's energy reserves if any elements are deficient. However, applying large quantities of fertilizer with an “it can't hurt” attitude is no longer the way to go (if it ever was). Excessive fertilization is not only a waste of time and money, but, especially with soluble nitrogen, it can be a potential threat to groundwater, streams and ponds.

Greening Up

Turfgrass is probably the most demanding plant when it comes to regular fertilization. Proper turfgrass fertilization not only ensures a beautiful playing surface, but also will help discourage insects and diseases. Striking the proper balance (in terms of adequate potassium levels) can even help turfgrass withstand drought.

Nitrogen (N) is especially important to proper turfgrass growth, although phosphorus (P) and potassium (K) also are important. The latest information from the University of Massachusetts states that turfgrass uses N-P-K at a ratio of approximately 4-1-2. Purchasing fertilizers with this ratio should give you good results.

Since nitrogen is the most used (and abused) nutrient, it pays to know a little bit about how it works. Nitrogen is essential to chlorophyll and protein formation. However, in order for the plant

to absorb nitrogen, it must be in the form of an inorganic nitrate ion (NO_3). In some cases, plants also use ammonium (NH_4^+) and amino (NH_2^+) ions.

An ion is simply an atom, molecule or compound that has a negative or positive charge. Ions are attracted or repelled by other ions, depending on the charge. Soil particles have a negative charge. Therefore, positively charged ammonium ions are held by the soil. Negatively charged nitrate ions, on the other hand, have no attraction to the soil particles and are easily leached.

In nature, most nitrogen is in an organic form. Soil microorganisms convert the nitrogen to an inorganic form through a process called mineralization. The number of soil microorganisms, temperature and moisture all affect the mineralization process.

One other term you will frequently hear in regard to nitrogen is “salt index.” Water is attracted to salt. If the salt content in the soil is high, the water actually moves from the plant to the salt in the soil. This causes “fertilizer burn,” which, in essence, is simply leaf dehydration.

Organic or naturally derived fertilizers release nitrogen at a relatively slow pace over a period of several weeks or months because they rely on soil microorganisms to mineralize the nitrogen. Ureaformaldehyde (UF), isobutyli-denediurea (IBDU), and sulfur-coated urea are manmade, but also considered slow-release. All are insoluble in water. They are normally low in salts, so the chance of burn is small to nonexistent. Applying slow-release fertilizers will not result in a rapid flush of growth. Finally, there is little potential for leaching and volatilization (conversion to a gas).

However, organic and slow-release fertilizers have been very slowly accepted. Fast green-up is often required. In addition, organic fertilizers are more expensive per unit of nitrogen. Finally, if the soil-microorganism population is low,

nitrogen release can be too slow for satisfactory results.

Quick-release fertilizers have been the primary choice of turfgrass professionals for decades. Ammonium nitrate, ammonium sulfate and several other quick-release fertilizers are all soluble in water. The low cost and fast results can make both players and accountants happy. In addition, because no microbial activity is necessary for mineralization, the nutrient is available even when soil temperatures are low.

However, quick-release fertilizers do have a few disadvantages. Most have a high salt index, and can burn plants if applied too heavily or if temperatures are very high. Because they release nitrogen quickly, they must be reapplied about every six to eight weeks. Finally, they have a higher potential for leaching and volatilization than slow-release fertilizers.

In recent studies conducted by soil scientist Sterling Olsen, fertilizer-use efficiency increased when both nitrate (quick-release) and ammonium (slow-release) fertilizers were combined. He also noted that combining the two types of fertilizers minimized leaching. Although his studies focused on corn plants, corn is a monocot just like turf, and considered a “heavy feeder.”

If you don't have the time or energy to blend your own fertilizers, don't worry. There are several commercially prepared fertilizers that combine quick- and slow-release forms of nitrogen all ready to go. Many also contain micronutrients, humates, enzymes and other biological “boosters.” These formulations can give you the best of both worlds in one easy application. The only drawback might be the initial cost. However, most will last all season long, saving time, labor and money in the long run.

If you are ready to refine your fertilization program, this spring is a great time to do it. New products and knowledge have made turf fertilization more environmentally friendly, cost-effective and efficient. □