

Organic and Slow-Release Fertilizers

By Helen M. Stone

Faced with demands from turf managers, nurseries, and other green industry professionals, fertilizer manufacturers produce an array of products that accomplish slower delivery of nutrients, particularly nitrogen. Some were developed only recently, while others have been available for years.

Quick-releasing forms of nitrogen, such as urea, can be coated with various substances to allow sustained release as the coating wears off. The "triggers" that cause these fertilizers to release their nitrogen include soil moisture, temperature, microbial activity and particle size. In addition, soil pH can also play a role.

Sulfur-coated urea (SCU) has been an economical source of slow-release nitrogen for several years. The urea, contained by the sulfur coating, escapes through cracks and pores. The breakdown of the coating and release of the urea is accelerated by microbial activity. In addition, the varied sizes of the particles cause some to release more quickly than others.

Resin-coated fertilizers are also a popular option. Water vapor penetrates the coating and dissolves the nutrients inside. The fertilizer is then slowly diffused through the coating. The products rely on soil temperature as a release mechanism. The warmer the soil, the quicker the release.

The latest coatings are polymer-based. The polymer coating depends mainly on soil moisture as a release mechanism. However, once the diffusion process begins, varying levels of moisture do not affect the speed of release, which is governed by the thickness of the coating. Polymers and sulfur have also been combined to create a "hybrid" coating.

Uncoated, slow-release fertilizers are also available. Ureaformaldehyde (UF) is synthesized by combining urea and formaldehyde. The nitrogen release rate of the new compound depends on both temperature and microbial activity. Isobutylidene diurea (IBDU) is manufactured in a slightly different

manner. It depends on soil moisture as a release mechanism. It is relatively unaffected by either microbial activity or temperature. The rate of release is determined by various particle sizes.

Turf managers who favor liquid fertilization also have a slow-release option. Methylene urea (MU), used in liquid formulation, depends on both microbial activity and soil temperature for release.

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Going Organic

Ten years ago, a turf manager who admitted using organic fertilizers was considered eccentric. However, today there are several organic fertilizer formulations on the market, with more and more groundskeepers exploring their possibilities.

"Organic" simply means that the substance contains carbon. Strictly speaking, IBDU and UF are organics, because they also contain carbon. There are even formulations available that combine organic and synthetic fertilizers. Perhaps a more accurate term may be "natural" — that is, these fertilizers are generally derived from animal, plant, or mineral sources, as opposed to a manufacturing process.

Organic fertilizers are derived from a number of sources. Manure of all types, sewage sludge, blood meal, cottonseed meal, granite dust and rock phosphate are a few. Generally, organic fertilizers have a lower nitrogen content than chemical fertilizers. They rely on microbial activity to slowly break down the nitrogen into a nitrate form.

Processed sewage sludge is perhaps the most widely known organic fertilizer. Available for years, it is especially useful in warmer months, when soil temperatures and microbial activity is higher.

If the thought of using a manure-

based fertilizer brings strong odors to mind, you may want to think again. Today's formulations of manure-based fertilizers are deodorized and sanitized.

In the past, many turf managers who experimented with organic fertilizers were disappointed. For the most part, organics do not produce fast results. However, it is possible to incorporate organics into an existing fertilization program and achieve good results.

Since organics depend in microbial activity for release, healthy soil is essential. Years of chemical use can reduce the quantity of soil microbes. Many organic fertilizers supply a small quantity of organic matter, which will gradually increase the general soil health and quantity of microbes. In addition, new formulations supply their own microbes (or bacteria) to help them release.

Topdressing with organic material, such as compost, also can increase the soil's organic content to some degree, and thus the amount of microbes it contains. Enzyme formulations and other biologically active products are available to increase the soil's microbial activity. These are primarily liquid formulations. One company even specializes in designing customized "microbial soups" that are injected through irrigation systems.

If it has been a while since you've experimented with your fertilizer program, this might be a good time to start. There are a wealth of new fertilizer formulations that promise good results with less labor. Keep in mind that sometimes the parts add up to something greater than the whole. Additives which correct soil pH, improve distribution of nutrient solutions, or increase microbial activity can make more nutrients available than before. Start small. Try tackling problem turf areas with different formulations. With a little innovation, you could become a more well-rounded sports turf manager. □

Editor's Note: Helen Stone is the editor of California Fairways and Arbor Age magazines.