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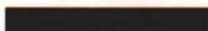
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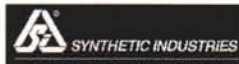
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APPLICATOR'S LOG

Water-Soluble Fertilizers and Sports Turf

By Mike Goatley

Water soluble, or "fast release," fertilizers have a significant place in fertility programs for sports turf managers. Characteristically water soluble fertilizers:

- are cost effective per pound of plant nutrient;
- provide quick turfgrass response, particularly if the nutrient is deficient;
- require frequent applications at lower use rates;
- have higher foliar burn potential;
- have a higher likelihood of leaching or off-site movement.

Cost

Cost is far too often the only criteria used when selecting a fertilizer. Water soluble fertilizers will almost always be cheaper than controlled-release sources, but this does not necessarily mean that they are the best buy for your situation.

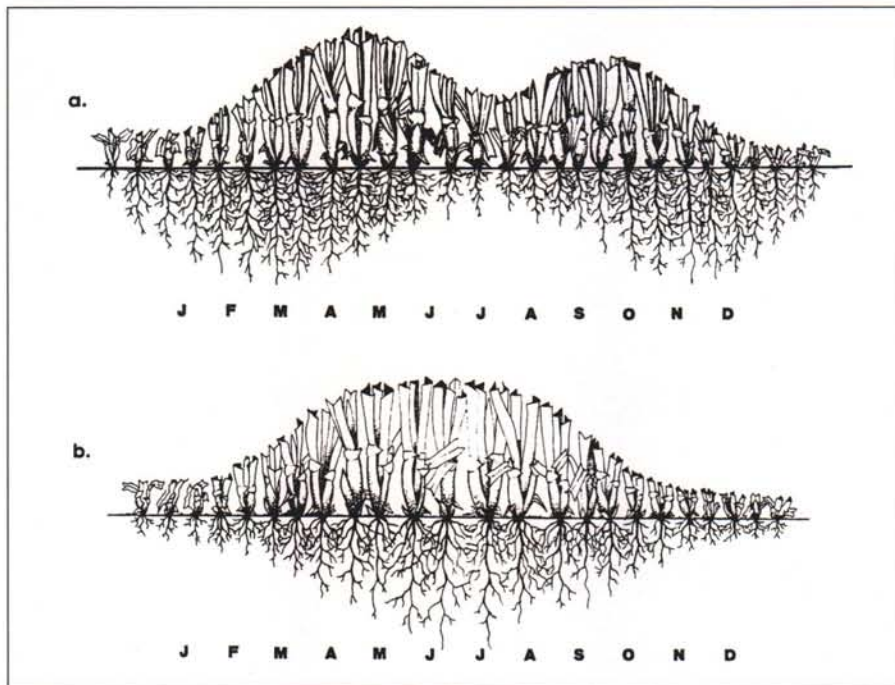
The rapid availability and leaching tendency of water soluble fertilizer sources dictates frequent applications at lower use levels. Consider this when comparing costs between fertilizer sources. Perhaps the savings of a water soluble source over a controlled-release fertilizer are negated by the increase in labor and equipment costs associated with the more frequent applications.

When considering water soluble fertilizers, don't always overlook agricultural grade materials. Ag-grade fertilizers are typically very cheap compared to specialty turf fertilizers.

The major disadvantages in using ag-grade products are the lack of particle uniformity and size, and the difficulty in storing some of them if partial bags remain. The water soluble fertilizers in partially filled bags absorb moisture from the atmosphere — which can lead to clumping of the fertilizer pellets, sometimes into a solid block! However, with a little extra care in handling, storage and application techniques, many agricultural-grade water soluble fertilizers can fit neatly into fertility programs with significant cost savings.

Shoots vs. Roots

Water soluble fertilizers are the choice for a rapid plant growth



Shown here are shoot and root growths of cool season (a) and warm season (b) turfgrasses. Diagram reprinted with permission from the fourth edition of *Turfgrass Management*, page 39, by A.J. Turgeon (Prentice Hall Inc., N.J.).

response. But remember, the rapid growth rates triggered by the N application are not always desirable.

The accompanying diagram shows root and shoot growth curves for both warm season and cool season turfgrasses. Fertility programs are developed from information provided in these growth curves. The job performance of turf managers is usually rated by the general public and field users by color and turf density. Dark green, thick turf will usually get you high marks. However, be wary of the fact that turf which looks good on the surface is not necessarily supported by the best roots.

The focus in fertility programs should be placed on developing healthy roots to support the shoots. This is done by making the high level N applications at times when root growth response will not be overshadowed by shoot growth.

Warm Season Grasses

For warm season turfgrasses, root growth and shoot growth curves are

virtually identical, with root growth lagging slightly behind shoot growth due to less fluctuation in soil temperatures as compared to air. Hence, significant applications of N that promote a healthy balance of roots and shoots should be made from mid spring through late summer, somewhat varying depending on location.

Early spring fertilizations just as bermudagrass is emerging from dormancy are tempting but should be avoided. The turfgrass will be expending most of its energy towards developing a canopy at this time in order to maximize photosynthesis rates. Significant water soluble N applications right after spring transition will boost foliar growth, but can actually lower root production. This can cause the turf serious problems later in the summer as hot, dry weather conditions occur. Also, the more succulent foliage that has been spurred on by the early N application will be very susceptible to damage from any late freezes that can occur.

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Chandler Arizona Parks Department Chandler, Arizona



Chandler Arizona selected Primavera bermudagrass for all fifteen of the new soccer fields they seeded in 1994 and 1995. In addition, they are using Primavera on all the city parks and grounds.

According to Kris Kircher, maintenance coordinator, they have used common bermudagrass before but had problems with allergic reactions among the players. Then they tried Mid-iron bermudagrass but it was very susceptible to pearl scale. The third variety they tested was Primavera. Kris was really impressed with its quick germination and establishment. It stayed greener longer in the fall and greened-up earlier in the spring than any of the other seeded types they tested. Primavera also was resistant to pearl scale, so their problems were solved.

Kris, and his crew of four, were able to convert old cattle corrals to excellent quality soccer fields. The San Tan Soccer Association plays on the fields nine months out of the year, and with the use by other groups, there are soccer games almost every day of the week throughout the entire season. The quality of the playing surface is excellent throughout the year. The number of injuries and loss of players have been greatly reduced with the dense turf they are able to produce with Primavera. It has been stated by numerous authorities that Chandler has the best soccer fields in the Phoenix area.

The work done by Kris and his crew is impressive, especially when one realizes that it was done on a minimum budget.

“Primavera is a high quality, lower cost alternative to the standard turf varieties sold only in sod or stolon forms.” *Kris Kircher, Maintenance Coordinator*

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Applicator's Log

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Because of these concerns, the recommendation for the first N application on warm season turfgrasses is usually 30 days after green-up. If you want to apply some fertilizers at this time, consider making applications of starter fertilizers — sources with high phosphorus (P) and potassium (K) levels, but comparatively low N levels.

Cool Season Grasses

While the curves for cool season turfgrass root and shoot growth are quite different, the philosophy in managing N fertility is exactly the same. The optimal time for making significant water soluble N applications is in the late summer/early fall when shoot growth is slowing and root growth is favored. The late summer/early fall fertility program also corresponds to the time when stored food reserves in the plant can also be maximized.

Note that root growth rates for cool season turfgrasses are quite significant in the spring, but the roots are

again overshadowed by the shoots at this time of year. High levels of water soluble N in the spring can result in the same problem for root growth as previously discussed for bermudagrass, and usually the discrepancy between root and shoots is even more pronounced for the cool season turfgrass. High N application rates in the spring on cool season turf can result in a grass that will be under tremendous stress during the summer months. Minimize N levels in spring applications to cool season turf and concentrate on applying P and K, particularly if recommended by soil or tissue tests.

Foliar Burn

As warm, humid weather conditions approach, be aware of the increased foliar burn potential of water soluble fertilizers. Fertilizer granules that land on leaves can attract water directly from leaf tissues, causing what is referred to as "foliar burn."

Always thoroughly water-in water soluble fertilizers to minimize this

problem and to put them in the root-zone where the nutrient is available to the plant.

Consider choosing water soluble sources that have lower foliar burn potential. For instance, ammonium nitrate and muriate of potash (KCl) have greater foliar burn potential than do ammonium sulfate or potassium sulfate, and these N and K sources are commonly used when environmental conditions (high heat and humidity) are conducive to foliar burn.

Sports turf managers are placed in situations where quick plant growth response and recuperation are needed due to wear and/or damage to the turf from field use. Water soluble fertilizers can best meet this need. However, never lock yourself into a particular fertility program — consider interchanging water soluble and controlled release sources to meet both your needs and the turf's.

Dr. Michael Goatley is an associate professor and agronomist in the Department of Plant and Soil Sciences at Mississippi State University.

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SoloRain's 8010 and 8030 wireless battery powered programmable solenoids are waterproof, compact, quick to install and easy to program. The units are submersible in up to six feet of water. The latching solenoid design uses minimal electrical consumption, allowing the actuators to operate on a single nine-volt battery for one year.

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