

a year. In addition to nutritional benefits, a light compost topdressing can improve soil microbial activity, aiding in soil aeration and overall health of the turfgrass planting.

Mulching methods

Dried turfgrass clippings applied as a mulch aid in weed control and prevent moisture loss in ornamental planting beds. While a three to four inch layer of mulch is necessary to reduce weed infestations, adding too much mulch prevents oxygen movement into the soil.

Mulches used around tree trunks should not come in contact with the trunk. Mulching with Bermudagrass clippings should be avoided due to its invasiveness, as should mulching

with clippings receiving recent or regular herbicide applications. Turfgrass clippings should be thoroughly leached before being dried and used as mulch if questions exist pertaining to any chemicals that may have been applied.

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Letter to the Editor

DEAR EDITOR,

I subscribe to TurfGrass Trends to try to stay current with the "state-of-the-art" in a variety of areas that influence turfgrass management practices. When I read the articles and commentaries by your scientific experts, I ascribe a high degree of credibility to their accuracy because I assume they are experts in their fields.

I was shocked and disappointed, therefore, when I read Dr. Richard Hull's response to the question, "How efficient is foliar feeding?" in the July 2000 issue of TurfGrass Trends. Not only is it neither clear nor accurate but it also ignores the current state-of-the-art in foliar technology. That's unfortunate.

It's unfortunate for us because we manufacture true foliar fertilizers and micronutrients and it's "our ox that's being gored." It's unfortunate for you because it doesn't advance your reputation as a publication on the "cutting edge" of turfgrass technology and science. And it's unfortunate for those readers who are field practitioners and who might benefit from the appropriate use of true foliar materials but won't because of the

impression created by Dr. Hull's answer to this question.

I would appreciate it if you would make some good faith attempt to present a more clear, accurate and balanced answer to the question "How efficient is foliar feeding?" in some future issues.

As a suggestion, it would be helpful to begin by defining what a true foliar fertilizer is. Liquids, water solubles and foliars are distinctly different. Most liquids and almost all water solubles are not foliars at all; they are designed for root uptake. They contain the same large macro molecules that granulars do but deliver them in a liquid or water soluble form.

True foliars are not designed for root uptake (although they can be taken-up by the roots). Rather, they are formulated to penetrate the leaf cuticle and be absorbed directly into the foliage of the plant. So while it is true that all foliars are liquids, it is not true that all liquids are foliars.

What defines a true foliar fertilizer is the size of the molecules. The size of the micropores in the surface of the leaf determines the size of the molecules that can penetrate the leaf. If the fertilizer molecules are too big, they can't penetrate. It's

like trying to stuff basketballs into holes the size of golf balls. So true foliar fertilizers are formulated with molecular miniaturization in mind.

True foliar fertilizers are designed specifically to overcome the inherent limitations of any root uptake dependent fertilizer (granular, liquid or water soluble). Their efficacy depends on such highly variable factors as soil moisture, microbiological activity and temperature.

In essence, true foliar fertilizers are designed to bypass the root system to give the practitioner a degree of control over his or her fertility program that is available in no other way.

Sincerely,

William D. Middleton
President
Emerald Isle, Ltd./ Ann Arbor, MI

DEAR MR. MIDDLETON:

I am sorry you found my response to the question on the efficiency of foliar feeding disturbing (*TurfGrass Trends*, July 2000). I must admit that in responding to the question I was not thinking of sophisticated applications using materials specifically designed for foliar absorption.

Rather, I addressed my response to the claims made by some lawn care companies who argue their liquid fertilizer applications are superior to granular because they have the advantage of foliar uptake. I also was thinking of the turf manager who mixes common soluble fertilizer materials in solution and sprays it on turf in the belief that direct foliar application is somehow better than soil treatments.

I have no argument with what you say and I probably could have avoided some confusion by restricting my comments to the above situations. However, as a general rule, there is no way foliar applied materials can be as efficient as the same quantity of nutrient applied through the roots. The physics of nutrient penetration through a leaf cuticle, the cuticular efflux of water especially during daylight hours and the relatively high concentration of

nutrient ions within the leaf cell walls all work against efficient foliar uptake. Add to this the limited redistribution potential of calcium and several micronutrients within a plant and the frequent partial defoliation inherent in turf management, and it becomes obvious why leaves are not the preferred route for nutrient acquisition. Given the high cost per pound of nutrient furnished as a foliar fertilizer, it is difficult for me to see any advantage of foliar fertilization over root feeding when there is nothing restricting root absorption.

However, as I believe I mentioned in my response, there are many situations in turf management when root function is restricted (nutrient fixing soils, dry soil, summer root decline, root predation by insects and cold soils) when a foliar application would not only be beneficial but the only practical way to apply nutrients. Because turf is managed so as to maintain constant vegetative growth (an unnatural condition for any perennial plant) there will be times when root function simply is not adequate. Thus, foliar feeding plays an important role in fine turf management and products, such as those marketed by Emerald Isle, very likely are much superior to ordinary fertilizers. The more intensively turf is managed, the more likely foliar feeding will play an important role in the fertilization strategy.

Thus, I do not believe we disagree on the basic issues of turfgrass fertilization and the role foliar fertilizers can play. It would be much appreciated if you, or someone in your company, could prepare an article for *TurfGrass Trends* on the new foliar fertilizers and supply data showing conditions when they are superior to normal root feeding. I have been unable to find much published information on these materials and I believe many readers, myself included, would find such an article extremely useful.

In any event, I hope this addresses your concerns.

Yours sincerely,

Dr. Richard Hull, University of
Rhode Island