Foliar Feeding — Friend or Foe?

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The answer to the question posed in the title of this article can be quite simply stated — it all depends on how you use it — a not unfamiliar factor in determining whether a particular deed will make a friend or an enemy. There can be no denying that liquid fertilizers applied as sprays can be quite useful in the turf maintenance program provided they are properly applied at the correct time and for the right purpose. Neither can it be denied that the indiscriminate and prolonged use of such fertilizers can result in utter disaster. It was the observation of several such disasters on a number of golf courses in the province of Quebec during the late summer of 1984 that prompted the preparation of this article. Recently acquired information that the promotion of the spray application of fertilizers is about to be greatly increased has emphasized the urgency of the situation and made it essential that the information contained herein be placed before the turf managing public at the earliest possible date. It is hoped that it will help turf managers to avoid similar catastrophies in the future.

It is universally accepted among turfgrass agronomists that the most important part of the grass plant is the part that we do not normally see — the root. If a deep, healthy root system can be maintained in a turf, the top will pretty well look after itself, with minimum assistance from the turf manager. Unfortunately many of the practices that we follow particularly that of close mowing, tend to reduce the develoment of the root system, thus making the turf susceptible to all forms of environmental stress and requiring maximum attention by the turf manager to nurse the sward through stressful times. Hot weather worsens the situation because it further causes root reduction.

If a person injures an arm and has it placed in a cast or sling for an extended period, the muscles in that arm become atrophied and the arm withers to the point that, when it comes out of the cast or sling it is practically useless, because of disuse, and it requires much exercises and probably physiotherapy to restore the tone and strength of the muscles. If a grass plant is continually fed through the leaves it has no further use for roots and because of this disuse the roots wither and die to the point that they become non-existent. We haven't discovered how to exercise or apply physiotherapy to roots so the plants must get along without them until root - regeneration time in the cool fall weather. Unfortunately it is usually too late by the time cool weather arrives since a turf without roots is unable to withstand any other environmental stress be it heat, drought, disease or any of the many other things that can happen and usually do occur during our stress-filled summer months. The result is dead turf and the consequent necessity of replacing it either by seeding or by sodding.

There are many advantages to the spray application of fertilizers, not the least of which is the fact that one can apply compatible pesticides, fungicides, herbicides, wetting agents and other materials along with the fertilizer thus reducing significantly the total amount of labour that would be involved in applying each of these materials separately. This is what appeals most to turf managers who are charged with the responsibility of growing the best possible turf at the lowest possible cost. This in turn is responsible for the continuous use of liquid fertilizers in spray form by otherwise excellent managers who do not realize what they are doing to the root systems of their turfed areas. The resulting damage will occur on any turf continuously treated in this manner but appears first on intensively managed areas such as putting greens where extremely close mowing has already reduced the amount of root development to the bare minimum required for survival. The damage is usually sudden, frequently overnight, and what the day before was a beautiful piece of turf is suddenly yellow to orange in color and quite dead in appearance. The amount of money required to replace this turf soon uses up any that was saved in making multiple applications in a series of one-spray treatments. The amount of revenue lost in reduced play, lowered public opinion and loss of memberships are incalculable.

Root reduction in foliar feeding is further influenced by the fact that nutritional imbalance is created by more rapid absorption of nitrogen than of phosphorus. The role of the latter element in root development is well know.

The question arises as to when foliar feeding may be practised to the advantage of the turf. Since the response of turf to foliar feeding is much more rapid (often overnight) than it is to dry applications to the soil it is most frequently used as a "shot-in-the-arm" treatment when the turf must be prepared quickly for a particular event or time. It is also useful when the need for an element, particularly a micronutrient, is acute. In the case of heavily compacted or water-logged soil conditions, foliar application of fertilizer will help sustain the turf until these conditions can be corrected.

In short, use foliar feedings to nurse turf through trying and stressful circumstances. But make sure the backbone of your fertilizer program is based on the application of dry fertilizers balanced to the particular fertility requirements of your soils, as determined by quantitatitve analyses. And **never under any circumstances** use foliar applications continuously in fall and early spring when root development should be at its peak.

Continuous and exclusive use of liquid fertilizers in spray form will eventually result in the destruction of turf, first on greens, then on tees and finally on any other turfed areas treated in this manner on a golf course. Even lawn-type turf is not immune to the "no root syndrome" caused by exclusive use of foliar feeding which will ultimately result in loss of turf and costly re-establishment practices.

Editors note: These observations by Dr. Boyce are well in line with research results reported by Norman MacLeod in 1958. A University of Massachusetts Master of Science Thesis entitled "A Comparison of Liquid and Solid Fertilizer for Turf" was among the first in the United States to be presented in response to questions raised by oil dealers who wanted to spray liquid fertilizers on turf in the "off season".