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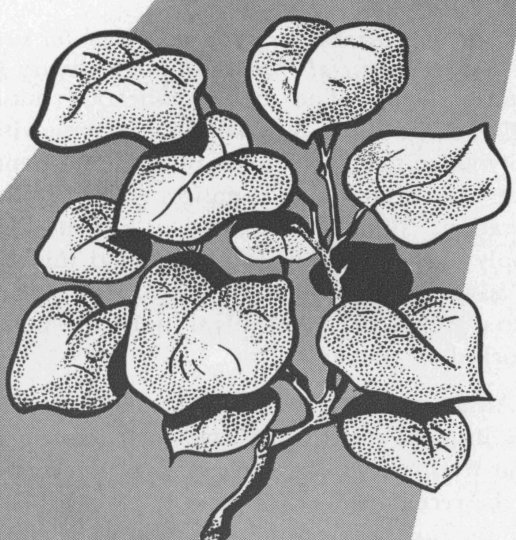
Foliar Feeding of Plants



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FOLIAR FEEDING OF PLANT NUTRIENTS

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What Is Foliar Feeding?

FOLIAR FEEDING OF PLANT NUTRIENTS generally refers to spraying dilute solutions of fertilizers on plant leaves. This includes the primary and secondary nutrients or micronutrients. Foliar feeding differs from the use of dry or liquid fertilizers, which are applied to the soil to supply needed crop nutrients.

Reports on foliar feeding of plant nutrients were published as early as 1844. Therefore, it has long been known that plants were able to absorb the various plant nutrients through the leaves, stems and roots.

Foliar fertilization is not a substitute for supplying most commercial crops with the necessary plant food elements. The main application must be made to the soil. Stimulation of crops without applying sufficient amounts of plant nutrients to meet the crops' needs creates a soil-depleting operation. With a few exceptions, it is possible to supply only a small part of the total nutritional needs in crop production, even if a number of sprays are used. Most plant nutrients must be absorbed by the roots.

Although foliar spray application at a critical time in plant growth may give outstanding results, foliar fertilization, based on years of research, cannot be recommended for general practice without defining the specific conditions. If these conditions are known and recognized, foliar fertilization can be of considerable value in nourishing the crop and protecting fertilizer investments.

General Need

Research on foliar feeding has been conducted on many crops. Foliar sprays of plant nutrients

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to correct specific plant nutrient deficiencies and to provide nutrients at critical growth periods have proved beneficial on some of these. Generally, the responses have concerned nitrogen and certain micronutrient elements when the nutrients were applied to crops prior to heading or maturing.

Responses to specific plant nutrients have been obtained in certain areas of Texas. Almost all crops respond to a foliar spray of nitrogen, and show a slight response to phosphorus and potassium. Calcium sprays have been used to control certain nutritional plant disorders. Little or no response has been obtained to the other secondary nutrients, magnesium and sulfur.

Crops in many areas of the State respond to foliar applications of certain micronutrients. Iron chlorosis can be controlled by a foliar application of iron. Zinc deficiencies have been corrected in pecans, certain fruit trees and corn with foliar applications of zinc. Boron sprays can correct boron deficiencies. Little or no response has been obtained from the other micronutrients, copper, molybdeum, cobalt and manganese.

Conditions for Foliar Feeding

The value of foliar feeding depends on a number of considerations: (1) The plant must be able to absorb and translocate the nutrient elements. (2) The plant must be able to absorb the nutrients in amounts sufficient to supply its needs without harming the plant. (3) The practice, to be accepted, must be effective and economical in comparison to soil application. (4) Foliar application usually is most effective at critical times in stages of plant growth. (5) Nutrients required in small amounts are usually most suitable for foliar feeding. (6) The pH, salt content of the water used, salt index of the chemicals used and certain toxic constituents can affect results. (7) The nature of the chemicals used may have different effects on different plants.

The greatest value of foliar fertilization likely will be on crops (1) where certain deficiencies can be corrected easily by spray treatments, (2) where spraying is already an established practice,

(3) where total leaf areas are large, (4) where conditions are not optimum for nutrient uptake by roots (5) and when there is a great demand for nutrients, such as during flowering and early fruit set.

When to Foliar Feed

Timing is extremely important in foliar fertilization. The effectiveness of foliar feeding is influenced by the kind of plant, age of the plant, its vigor, stomates, time of day the application is made, temperature, humidity, detergents or sticker-spreader used, pH and carrier ion and amount of leaf and stem area. The cost of the material is of less concern when considering those nutrients required in the smallest amounts – the micronutrient elements.

Foliar applications usually should be made when a plant is in great need of plant nutrients and is growing rapidly *or* when a deficiency symptom first appears. Repeating foliar applications may be necessary on certain plants if nutrient deficiency symptoms reappear.

Apply foliar materials in late evening, since evaporation of moisture from the leaf surface is slower at this time. Certain foliar fertilizers can be applied with insecticides. Check the compatability of the fertilizer and insecticides before mixing them for application.

Precautions

1. Growing leaves may be damaged from high salt concentrations; therefore, *foliar sprays should seldom exceed a 2 percent fertilizer salt concentration.* Certain micronutrients, particularly zinc and copper, should not exceed a 1 percent salt solution.

2. Certain plants, particularly strawberries, should not receive foliar sprays during the heavy blooming period.

Summary

Foliar fertilization of the major plant nutrients should be considered not as a replacement of regular soil application but a supplement or

booster-type application. Foliar sprays can *help* correct mineral deficiencies, provide specific nutrients at critical periods and adjust nutrient levels to climatic variations.

The plant requirement for nutrients is the same regardless of the application method. Micronutrient elements, because of the small amounts required and the possibility of their immobilization by the soil, often are applied most efficiently by foliar fertilization.

When considering foliar fertilization, decide on the basis of need, its practicability and if it is economical.

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