



# GOLF TURF NEWS

## NUTRITIONAL FACTORS Affecting Woody Ornamentals

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Extension Agent I

An extensive amount of time and money is spent for fertilization of landscape and nursery plants. Sometimes fertilizer is applied without really knowing what role a particular nutrient plays in the plant. Let's take a brief look at the different nutrients plants need and why they are necessary.

Basically, 15 different chemical elements are essential to the plant's growth and survival. The quantity needed varies greatly from element to element; however, even the elements required in minute amounts are essential for proper plant growth. Three of the elements, carbon, hydrogen, and oxygen are adequately supplied to the plant in the atmosphere. The 12 remaining essential elements are taken up by the plant through the roots. These 12 elements are generally divided into two categories the macro (major) nutrients and micro (trace) nutrients. The elements which are considered macronutrients include iron, manganese, zinc, copper, boron and molybdenum and each plays an important role, essential to the plant's growth and survival. Briefly, let's look at the role of these elements to get an idea of the importance to the plant.

### *The Macronutrients*

The role of *nitrogen* can be very simply described. It is the basis of amino acids which then form into proteins within the plant. *Phosphorus* is an important component of cell membranes and DNA. It also provides a means of allowing the energy produced in one area of the plant to be consumed in another area. *Potassium* controls stomatal opening and closing as well as being the primary enzyme activator within the plant. A large amount of *potassium* is also used in the photosynthetic process. *Calcium* plays an important role in pH control in the soil as well as detoxifying excess amounts of metal ions within the plant. *Magnesium* plays a number of diverse roles in the plant including affecting cell division, acting as a phosphate carrier through the plant and being a part of the chlorophyll molecule. *Sulfur*, much like nitrogen, is an important constituent of amino acids which form plant proteins. This element has the ability to acidify soil areas where the pH is excessively high.

### *The Micronutrients*

The micronutrients (trace elements) may not be needed in the great amounts, however, they are involved in many

complex and essential functions within the plant. Iron is a vital part of proteins which provide energy for many important plant functions such as photosynthesis and respiration. *Iron* is also important in the formative stages of chlorophyll. *Manganese* is involved in fatty acid and vitamin production as well as playing an essential role in oxygen production during photosynthesis. *Zinc* has been found to be necessary in the process which makes nitrogen and phosphorus usable in the plant. It is also necessary for proper production of auxins within plants. *Copper* even though it is required in very small quantities, plays an important role in respiration and is constituent of enzymes and pigments. *Boron* is needed in the transport of sugars across the membrane of a plant cell as well as being involved in the hardening (lignification) of cells. Finally, *molybdenum* which is required in minute amounts, is needed to convert nitrogen and phosphorus into a form useful to the plant.

### *WHY DEFICIENCIES OCCUR*

As you can see, the different nutrients are required within the plant in a large number of different ways. Many areas of South Florida, particularly sandy locations, are deficient in some of the essential nutrients. When the nutrients are applied to these sandy soils or in situations with extremely low pH they leach readily. In high pH soils many nutrients have a tendency to become chemically bound in the soil and therefore unavailable to the plant. High pH soils are frequently found in areas where fill has been used. Most landscape plants here grow best in a slightly acid soil.

### *COMMON NUTRIENT DEFICIENCIES IN SOUTH FLORIDA*

Certain nutrient deficiencies occur more commonly than others in South Florida soils. It is useful to know the relative mobility of a nutrient within the plant when attempting to diagnose a possible nutritional deficiency. If a nutrient is mobile within the plant, the deficiency symptom will occur on older leaves while a nutrient which is immobile will show deficiency symptoms on younger leaves.

The most common deficiencies which are found in the South Florida area are nitrogen, magnesium, iron and manganese. Nitrogen and manganese are quite mobile within the plant, while iron and manganese are immobile. *Nitrogen* deficiency symptoms appear as an overall yellowing of the plant foliage without any definite patterns.

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These symptoms will appear first on the older foliage then rapidly spread over the entire plant. This situation is most often found on plants which have not received fertilization for a long period of time. *Magnesium* deficiency appears on the older foliage with yellowing or bronzing occurring at the base of the leaf and working its way up the leaf as the deficiency progresses. This deficiency is commonly seen on a number of palm species, podocarpus and pittosporum. Symptoms of *iron* deficiency first appear on young leaves at shoot terminals. During the early stages of iron deficiency a pronounced yellowing of foliage occurs with the veins and veinlets remaining green thus giving a netted appearance. In the latter stages of this deficiency leaves become smaller and dead spots and marginal burning may appear. A few of the many plants affected by iron deficiency include ixora, citrus, hibiscus and camellia. *Magnesium* deficiency appears as two different symptoms depending on the plant type. Broadleaf species show this deficiency as a yellowing of leaf tissue between the midrib and the main vein. *Manganese deficiency differs from iron* deficiency. In *manganese* deficiency a broader green area remains along the veins. *Iron* deficiency and *manganese* deficiency may be quite difficult to differentiate. Some of the species which exhibit this deficiency include allamanda, bougainvillea, ligustrum and viburnum. On palm and cycad species the *manganese* deficiency symptoms are quite different. New emerging leaves become smaller and malformed. These leaves fail to expand and appear to be crinkled. This condition is called frizzle top. Palms which may show these symptoms include Queen Palm, Date Palms, Fishtail palms, and Sago Palm.

Other nutritional deficiencies may occasionally appear in nursery or landscape situations from time to time. To add to the confusion of what a deficiency may be, more than one deficiency may occur at one time. Particularly in cases when the soil pH is quite high. Two IFAS Cooperative Extension Service publications which may be helpful are Bulletin 791, *Nutritional Deficiencies of Woody Ornamental Plants Used in Florida Landscapes* and Circular 352-A, *Soil Reaction (pH) for Flowers, Shrubs and Lawn Around the Home*. Other publications are available concerning each of the essential elements. Contact the Extension at 689-1723 for these publications. ■

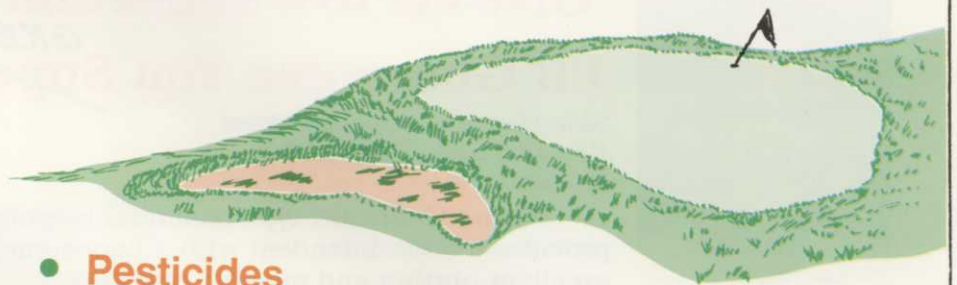
## STALFORD NAMED DIRECTOR OF SEED DEVELOPMENT

Harry Stalford has been named director of turf seed development at International Seeds, Inc., Halsey, Ore. according to J. L. Carnes, president.

Stalford returns to ISI after a two-year sabbatical during which he was manager/partner of one the largest turf and forage seed farms in Oregon's Willamette Valley.

His responsibilities at International Seeds will include customer contact, distributor sales and the overseeing of convention activities.

International Seeds is a breeder, marketer and distributor of quality turf and forage grass seeds. ■



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