Characterization of Nutrient Disorders of Lilium longiflorum ‘Nellie White’ and Lilium Hybrid ‘Brunello’

Easter lilies (Lilium longiflorum Thunb., Liliaceae) and hybrid lilies are important floriculture crops for potted plants and cut flowers. This paper serves to document the symptomology of nutrient disorders of Easter and hybrid lilies and to obtain critical tissue values.

Nitrogen (N) deficiency: Plants were 40% less in dry weight than controls. Symptoms included yellow lower leaves, leaf loss, and overall small leaf size.

Calcium (Ca) deficiency: Initially, brown spots occurred on the distal tips of upper leaves. As the disorder progressed, the spots became larger, young flower buds became brown and aborted, and large flower buds abscised. Affected leaves then developed a purple-brownish coloration.

Sulfur (S) deficiency: Upper leaves developed a yellowish-green coloration over the entire leaf, with some darker green coloration of the veins.

Boron (B) deficiency: Plants weighed 47% less than control plants. No other symptoms were observed.

B toxicity: Initially, plants exhibited yellowing on lower leaf tips. As the disorder continued, yellowing progressed inward on the leaf toward the stem until the lowest leaves were completely yellow. Leaves in the middle then began exhibiting symptoms.

Iron (Fe) deficiency: Upper leaves became yellowish-green. The coloration was present over the entire leaf and some of the veins appeared to be a darker green color.

No visual symptoms were observed for those plants grown under phosphorus (P), potassium (K), magnesium (Mg), copper (Cu), manganese (Mn), molybdenum (Mo), and zinc (Zn) deficient conditions after 13 weeks of growth. Tissue analysis determined that significant differences occurred in the plant tissue concentrations between deficient and control plants for P, K, Mg, and Mn (Table 1 and 2). It is hypothesized that deficiency symptoms were not observed in this experiment because the levels in the plant had not dropped below the point where growth would be interrupted to induce a deficiency symptom.

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Table 1. Lilium longiflorum ‘Nellie White’ plant dry weight and tissue nutrient concentration as affected by deficient or toxic induced nutrient treatments and published optimum concentrations.

Table 2. Lilium hybrid ‘Brunello’ plant dry weight and tissue nutrient concentration as affected by deficient or toxic nutrient treatments and published optimum concentrations.