

AZALEA CHLOROSIS AND LEAFBURN¹

R.E. Widmer and L.C. Lin²

Chlorosis and necrosis have developed at intervals on plants of the cultivar Gloria and related cultivars. Other cultivars treated similarly did not develop the symptoms. Usually the first symptom was marginal chlorosis on a few leaves about 1 inch from the tip of main shoots. Necrosis followed and in advanced cases severe restriction of leaf size, leaf loss and die-back of the tips of side shoots developed.

No evidence of any insect or pathological causes could be found. Environmental factors appeared to play a significant role. High light intensity, high air temperatures and low relative humidity favored development of the symptoms. Soil nutrition levels didn't give clues to the cause. Presence of symptoms did vary with the growth medium employed.

Foliar analysis showed that the copper level in the plants was usually around 3 ppm or less; 2 ppm or less in the most severely affected plants. Application of a commercial soluble trace element mix resulted in improved growth, but did not completely eliminate the problem. Copper levels in these treated plants ranged from 2.0 to 3.3 ppm.

A group of Gloria plants which had been potted in Florida and subsequently grown in Leamington began showing severe symptoms, while a similar group, potted in Leamington, appeared normal. Copper levels in these plants were 1.75 and 3.11 ppm, respectively. Affected plants were given a soil drench of 500 ppm of copper sulfate (2 gr/4000 ml or 7 oz/100 gal of water). Within 2 weeks, the development of chlorotic leaf margins ceased. A second application of copper sulfate 2 weeks later further improved growth.

Discussions with B. Tjia, extension specialist at the University of Florida, Gainesville, revealed that he had been conducting a similar investigation. He also concluded that a copper deficiency was involved. Penningsfeld (2) has reported on copper deficiency of azaleas and recommended one application of a 250 ppm solution of copper sulfate to the growth medium. Sciaroni and Branson (3) have also reported on azalea copper deficiency. They corrected the problem by spraying the plants until runoff with a copper sulfate solution of 0.2 to 0.4 pounds (approximately 3 to 6 ounces) per 100 gallons of water. Growing Azaleas Commercially (1) has a discussion of azalea mineral nutrition.

Summary and Discussion

1. Copper deficiency appears to be a major cause of abnormal growth in "Gloria" and related azalea cultivars.
2. A foliar level of 3 ppm copper appears to be marginal and a minimum of 5 ppm is recommended.
3. Environmental conditions which encourage water stress tend to encourage the development of copper deficiency symptoms. Based on observations at Leamington, light intensity in excess of 1,000 footcandles, air temperatures over 85°F and a relative humidity under 80 percent encouraged the development of symptoms when plant copper levels were low. This light level may not be adequate, however, for optimum flower bud initiation and development.

4. The sphagnum moss peat medium usually used for azaleas contains minimal amounts of copper. The highly refined soluble fertilizers usually used contain only minimal quantities of micro-elements. Thus applications of copper at periodic intervals should be considered. Periodic foliar analysis is advisable.

References

1. Kofrenok, A.M. and R.A. Larson. 1975. Growing Azaleas Commercially. Sale Publication 4058. University of California, Berkeley.
2. Penningsfeld, F. 1962. Die Ernährung in Blumen und Zierpflanzenbau. 2nd. ed. Verlag Paul Parey, pp. 47-60. Berlin, Germany.
3. Sciaroni, R.A. and R. Branson. 1969. Copper Deficiency in Azaleas. California Flower and Nursery Notes, April.

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²W.C. Lin was associated with Yoder-Atkin Ltd., Leamington, Ontario when working on this problem.
Present address: Canadian DAG RES Sta, Sidney, BC, Canada.