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Nitrogen Critical Level Determination in The Woody Ornamental Shrub *Euonymus fortunei*

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ABSTRACT

We determined the critical nitrogen (N) level on greenhouse-grown winter creeper (*Euonymus fortunei* Hand. Mazz. 'Colorata') in one-gallon containers by adding N in doses of 0 to 400 mg/pot as ammonium nitrate (NH₄NO₃) and growing plants for 50 days without leaching. At harvest, leaf N concentrations were similar in all treatments up to 150 mg/pot, but increased with applied N above 150 mg/pot. Yield increased with increasing leaf N up to about 1% N, but was relatively constant at higher leaf N. The leaf N critical level was 1.03%. Shoot:root ratio, based on new growth, decreased with applied N. This method for critical level determination provides an accurate description of the relationship between leaf N and growth and may be used by growers to improve fertilizer use efficiency.

Keywords: nitrogen deficiency, foliar analysis, nutrition, critical level, nursery production, winter creeper

INTRODUCTION

The commercial value of container-grown woody plants is based typically on height and stem diameter, and container nursery producers often use high levels of nitrogen (N) in their fertilizer regime to meet production goals at maximum growth rates (Johnson et al., 1981; Maust and Williamson, 1994). As a result, growers often apply N in excess of plant need (Johnson et al., 1981; Cabrera et al., 1993; Cabrera, 2003). Excess N typically is leached, and loss of applied N can be substantial. Rathier and Frink (1989) reported leaching losses

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