



## Effect of Earthgreen Biostimulant on Growth and Fertilizer Rates of Three Containerized Ornamentals.

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### NATURE OF STUDY

Commercial biostimulants containing humic substances are being recommended by suppliers to increase root growth, reduce transplant losses, increase drought tolerance, and to reduce fertilization requirements. The purpose of this research was to determine the effect of the biostimulant Earthgreen on shoot growth and fertilizer requirements of containerized ornamentals.

Rooted cuttings of *Rhododendron* »Miss Augusta« (azalea), *Ilex crenata* »Compacta« (holly), and *Ligustrum japonicum* (ligustrum) were transplanted into trade-gallon containers on May 11, 1999. The treatments were four rates of Earthgreen (Menefee Mining Corporation, Dallas) granular biostimulant incorporated (0, 2.5, 5.0, and 7.5 lbs/ cu. yd) into a 6 bark: 1 sand media and two Sierrablen (16N-8P-12K with minors) fertilizer rates (reduced or recommended rates).

The »Miss Augusta« azalea fertilizer rates were 1.5 or 2.5 lbs N/ cu.yd and the the fertilizer rates for the other two plants were 2.5 or 3.5 lbs N/cu. yd. Growth index and pH were determined on September 13, 1999. Shoot dry weight was determined on December 11, 1999. The dried tissue of *Ilex* was inadvertently thrown away before weighing. The growth index (GI) was determined by measuring maximum height (H), maximum width (W1) and width perpendicular to W1 (W2) and calculated as  $GI = (H+(W1+ W2)/2)/2$ .

### RESULTS AND DISCUSSION

Earthgreen did not effect the pH of the container media, but increasing the fertilizer rate reduced the pH (data not presented). The increased ammonium present in the media in the higher fertilizer rate treatment containers would prompt a reduction in pH.

The growth of all taxa was greater in the higher fertilizer treatment (Table 1).

For the September 13th data, according to contrast comparisons, no significant growth index differences existed between the higher fertilizer rate, no Earthgreen treatment and the lower fertilizer rate, Earthgreen treated plants. This indicates that the Earthgreen treatments did increase growth of the lower fertilizer rate treatment plants and can potentially reduce requirements for fertilizer. Earthgreen does not provide nutrients to plants, however, biostimulants such as Earthgreen can increase the cation exchange capacity and increase nutrient uptake.

The September 13th data indicate that the minimal incorporation rate of 2.5 lbs/ cu.yd of Earthgreen is best. Other studies have indicated that biostimulants are rate dependent.

By the final December 11th sample date, the data indicate that the beneficial effect of Earthgreen on growth was not sustained except for the low fertilizer rate azalea treatments. The Earthgreen treatment did increase shoot growth of the low fertilizer rate azaleas. However for both taxa, the shoot weights of the high fertilizer rate, no Earthgreen treatment plants were significantly greater than the low fertilizer rate, Earthgreen treatment plants. In sum, the Earthgreen treatment was not able to compensate for the reduction in fertilizer in the low fertilizer rate treatment plants. Other studies indicate that biostimulants should be applied as frequently as once per month and perhaps monthly or bimonthly treatments could have sustained Earthgreen's beneficial effect on low fertilizer treatment plants.

### SIGNIFICANCE TO THE NURSERY INDUSTRY

Earthgreen can increase growth of plants, and can reduce fertilizer requirements of container-grown woody ornamentals. More research is needed to examine application frequency, and monetary and environmental costs for Earthgreen applications.

**Table 1 Effect of Earthgreen biostimulant on growth on two sampling dates (1999) of three**

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Taxa	Fertilizer Rate (lbs/ cu. yd)	Growth Index (Sept 13) Earthgreen (lbs/ cu. yd)				Shoot weight (g) (Dec. 11) Earthgreen (lbs/ cu. yd)			
		0.0	2.5	5.0	7.5	0.0	2.5	5.0	7.5
Rhododendron Miss Augusta	1.5	22.7	27.1	26.8	25.8	14.1	26.3	25.2	20.6
	2.5	28.3	32.8	28.8	25.2	32.3	37.1	32.1	28.5
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Ilex crenata Compacta	1.5	35.7	39.4	38.4	37.2				
	2.5	40.4	37.8	40.5	37.9				
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Ligustrum japonicum	1.5	46.6	49.4	46.6	43.3	61.5	63.7	58.3	62.8
	2.5	54.4	55.1	51.3	47.5	83.7	80.0	83.0	73.4

