Effect of ROOTS Dry Formula 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 ROOTS Dry Formula on shoot growth and fertilizer requirements of containerized ornamentals.

Rooted cuttings of *Rhododendron* ›Coral Bells‹ (azalea), *Ilex crenata* ›Compacta‹ (holly), and *Ligustrum japonicum* ›Recurvifolium‹ (ligustrum) were transplanted into trade-gallon containers on May 8, 1998. The treatments were three rates of ROOTS Dry Formula (Roots Inc., New Haven, Conn.) granular biostimulant incorporated (0, 12.5, and 25 lbs/ cu. yd.) into a 6 bark: 1 sand media and two Sierrablen (16N-8P-12K with minors) fertilizer rates (recommended or reduced rate).

According to the label ROOTS Dry Formula is 3%N, 3% P_2O_5, and 3% K2O and is derived from sea kelp, alfalfa meal, peat humus, poultry manure, iron sulfate, magnesium sulfate, myo-inositol, glycine, and vitamins B_1, C, and E. The ›Coral Bells‹ 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 July 1, 1998. Shoot dry weight was determined on December 1, 1998. The growth index (GI) was determined by measuring maximum height (H), maximum width (W10) and width perpendicular to W1 (W2) and calculated as GI = (H+(W1+ W2)/2)/2.

RESULTS AND DISCUSSION

The ph of the container media was lower for the higher, recommended rate fertilizer treatments than for the reduced fertilizer treatments (data not presented). The higher ammonium-N in the higher fertilizer treatment media would cause this decrease in pH at higher fertility rates.

Increasing the fertilizer rate and increasing the amount of ROOTS increased the growth index, leaf weight, and stem weight of the holly and ligustrum plants. The holly and ivy responded to the increased amount of fertilizer provided in the increased amount of ROOTS. At the lower fertilizer rates, the ROOTS product appeared to increase the leaf weight and root weight of the azalea, however the effect was not significant. At the higher fertility rates, the ROOTS product significantly decreased the growth of the azaleas. Azaleas are more sensitive to overfertilization than ligustrum or holly.

For the holly and ivy plants, statistical contrasts performed between the control (high fertilizer rate, no ROOTS) and the low fertility, ROOTS treatment plants indicated that ROOTS can compensate for the reduction in fertilization in the lower fertilizer treatment plants. The reduced fertility, ROOTS treatment plants were similar in size to the recommended fertility, no ROOTS treatment plants. From this study, one can not determine if the cause of the increase in growth prompted by the ROOTS treatment was due to the nutrients in ROOTS or the biostimulants in ROOTS. Also, ROOTS is not a cost effective replacement for fertilizer.

SIGNIFICANCE TO THE INDUSTRY

Incorporation of ROOTS Dry Formula in the container media can increase growth of some container-grown plants (holly and ligustrum), but may decrease growth of others (azalea). ROOTS will compensate for reductions in fertilizer supplied by other sources, but is not a cost effective replacement for fertilizer.

Table 1. Effect of ROOTS Dry Formula biostimulant on growth on two sampling dates of three containerized plants at two fertilizer rates.

		July 1, 1998			December 1, 1998					
		Growth Index			Leaf weight (g)			Stem weight (g)		
		ROOTS (lbs/ cu. yd)			ROOTS (lbs/ cu. yd)			ROOTS (lbs/ cu. yd)		
Taxa	Fertilizer Rate (lbs/ cu. yd)	0.0	12.5	25.0	0.0	12.5	25.0	0.0	12.5	25.0
Rhododendron ›Coral Bells‹	1.2	14.9	16.8	24.2	11.4	12.4	16.2	9.3	10.6	13.0
	1.5	16.1	15.5	15.6	16.3	15.1	14.6	13.4	12.3	8.9
Ilex crenata ‹Compacta‹	1.5	16.5	16.5	17.7	11.1	11.7	13.9	13..4	12.5	17.2
	2.5	17.1	17.8	17.5	12.6	16.1	16.1	15.2	19.7	19.1
Ligustrum japonicum	1.5	22.2	22.6	22.8	27.3	31.9	35.2	13.9	16.4	19.9
	2.5	23.6	22.5	23.2	31.2	39.4	38.8	12.7	21.2	20.4

Planted on May 8, 1988