Effect of Bedminster Composted Municipal Solid Waste and Two Fertilizer Rates on Growth of Five Containerized Ornamentals.

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NATURE OF STUDY

Numerous composted municipal solid wastes (MSW) are available at an inexpensive price for use by nurseryman as a component of container media. These products can supply macronutrients, supply micronutrients, increase water holding capacity, increase the cation exchange capacity, and increase pH. By adding MSWs to container media, fertilizer requirements for plants can be reduced because of nutrients supplied by the compost and the increased cation exchange capacity of the compost. The preliminary experiment will determine the effect of Bedminster composted municipal solid waste (Cobb County, Georgia) on shoot growth and fertilizer requirements of five containerized ornamentals. Bedminster Compost is a compost of garbage and sewage sludge.

Rooted cuttings of *Rhododendron* ›Coral Bells‹ (azalea), *Ilex crenata* ›Compacta‹ (holly), *Ligustrum japonicum* (privet), *Liriope muscaria* (liriope) and *Hedera helix* (ivy) were transplanted into trade-gallon containers on May 14, 1998. The treatments were four rates of Bedminster Compost incorporated by volume (0%, 20%, 40%, and 60%) into a 6 bark: 1 sand media and two Sierrablen (16N-8P-12K with minors) fertilizer rates (recommended rate and a reduced rate). The media was amended with 7 lbs/ cu. yd of dolomitic limestone. The ›Coral Bells‹ azalea fertilizer rates were 1.5 or 2.5 lbs N/ cu. yd. and the the fertilizer rates for the other four taxa were 2.5 or 3.5 lbs N/cu. yd. Media pH and leaf, shoot, and root dry weights were determined on November 1, 1998.

RESULTS AND DISCUSSION

For all taxa, the higher, recommended fertilizer rate increased the leaf, stem, and shoot weights compared to the reduced rate of fertilization. The pH values of the recommended fertilization rate media were lower than the media pHs of the reduced fertilization rate (data not presented). The lowering of the pH with fertilization is commonly observed because of the acidifying effect of ammonium in fertilizer. The Bedminster compost increased the media pH from a median of 4.4 in the unamended compost to a median of 6.6 for the 60%-amended treatment (data not presented).

The higher Bedminster Compost rates reduced leaf weight, stem and root weight of the azalea, holly, and ivy. (Table 1) Amending with Bedminster compost had no effect on leaf and stem dry weight of privet, but increased root growth of privet. Bedminster Compost had no significant effect on growth of liriope. The limited growth differences indicate that use of Bedminster compost to provide supplemental nutrition is not justified. The decrease in growth could have been caused by a change in drainage in the

media, which was not quantified in this experiment. The reduced root growth could have been caused by the poor aeration of the potentially, more poorly drained amended media.

Comparisons performed between the control plants (unamended, recommended fertilization rate) and plants grown at lower fertilizer rate treatments and amended with Bedminster compost also indicated that the compost was not providing supplemental nutrients.

For all plants, no measured growth difference existed between the unamended control and the plants grown in media amended with 20% Bedminster Compost. This indicates that the Bedminster Compost can be added to container media at a this low rate without any detrimental effect on the growth of the plants.

SIGNIFICANCE TO THE INDUSTRY

The results of this experiment indicate that Bedminster Compost can not be used to reduce fertilization requirements of ornamentals in container production. However. Bedminster Composted can be added to container-growing media at a low rate (20%) without a reduction in growth. This indicates that nurseryman could be a viable outlet for utilizing Bedminster Compost, reducing the excess stockpiles of this waste product, and potentially reduce media costs for the nurseryman.

Table 1. Effect of Bedminster composted municipal solid waste on growth of four containerized plants at two fertilizer rates.

Taxa	Rate (lbs/yd^3)	Leaf weight (g)				Stem weight (g)				Root weight (g)			
		% Compost Fertilizer				% Compost				% Compost			
		0	20	40	60	0	20	40	60	0	20	40	60
Rhododendron ›Coral Bells=	1.5	6.2	4.8	5.2	4.8	3.1	2.8	2.8	2.2	4.5	2.8	5.4	2.3
	2.5	6.3	6.8	5.5	5.3	3.3	3.3	2.9	2.8	3.9	4.2	4.0	2.6
Liriope	2.5	5.6	6.2	5.7	5.8	*	*	*	*	4.8	4.4	4.6	4.1
	3.5	7.0	7.5	6.3	7.0	*	*	*	*	4.2	3.8	4.0	4.1
Ilex crenata =Compacta=	2.5	5.3	5.5	3.9	3.8	3.0	33.5	2.4	2.4	3.0	2.8	2.2	2.7
	3.5	7.0	6.4	5.1	4.1	4.3	4.1	3.0	2.4	3.6	2.7	2.2	2.0
Ligustrum japonicum	2.5	8.3	9.0	9.6	8.2	2.0	2.4	2.6	2.4	2.4	3.6	4.0	3.4
	3.5	10.2	10.8	9.7	9.8	2.6	3.1	2.8	2.6	2.9	4.9	4.0	3.5
Hedera helix	2.5	12.1	9.3	9.0	7.5	6.6	4.9	4.4	4.5	1.1	0.7	0.6	0.5
	3.5	11.8	10.1	8.7	6.3	5.6	4.9	4.7	3.6	0.9	0.7	0.6	0.4

Plants were planted on May 11, 1998, and sampled on November 1, 1998.
The shoot weight of liriope were weighed and presented in the leaf weight columns.