Table 7. Effects of production fertilizer level and indoor light intensity on number of flower stalks per plant on *Begonia* 'Vodka' and the change from the number of flower stalks at termination of greenhouse production after being in interior rooms for 3 and 6 weeks.

g 14N-6.2P-11.6K per 10-cm pot	Number flower stalks[z] after 3 wk in interiors	Change in number stalks[y]	Number flower stalks[z] after 6 wk in interiors	Change in number stalks[y]
1.0	8.2	-7.8	2.0	-14.0
1.5	6.0	-8.4	2.9	-11.5
2.0	4.5	-9.7	2.3	-11.9
2.5	4.3	-11.6	2.4	-13.4
Significance				
Linear	0.0001	0.0068	0.7558	0.7326
Quadratic	0.1054	0.5734	0.3550	0.0152
Light intensity ($\mu mol \cdot m^{-2} \cdot s^{-1}$)				
12	2.6	-12.2	0.1	-14.6
24	6.0	-8.8	2.5	-12.4
36	6.2	-8.6	3.3	-11.5
48	8.3	-7.8	3.7	-12.4
Significance				
Linear	0.0001	0.0041	0.0001	0.0425
Quadratic	0.2528	0.2242	0.0012	0.0548
Cubic	0.0390	0.4042	0.3676	0.9230

[z]Number of flower stalks per plant with two or more flowers after indoor period.
[y]Number of flower stalks per plant after greenhouse production minus number of flower stalks per plant after indoor period.

is more important indoors than production fertilizer for these plants. This experiment did show that there is potential for using these begonia varieties in interior landscaping without having to replace the plants too frequently provided sufficient light (24 $\mu mol \cdot m^{-2} \cdot s^{-1}$ or higher) is available. Begonias with the ability to remain attractive indoors for 6 to 9 weeks at 24 $\mu mol \cdot m^{-2} \cdot s^{-1}$ or higher could compete favorably with many potted flowering plants presently utilized in interiors.

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EVALUATION OF A YARD WASTE COMPOST AS A POTTING MEDIUM AMENDMENT FOR PRODUCTION OF POTTED *AGERATUM*

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Additional index words. organic matter, recycling, soil amendment.

Abstract. **Verlite Nursery Mix A, a commercially-prepared, peat-based potting medium for greenhouse crops was blended with an Orange County yard-waste compost in 25% increments by volume from 100% peat-based medium to 100% compost. Fertilizer was added at the rate of 0, 2, 4, and 6 g of Osmocote™ 14N-6P-11.6K (14-14-14) per 12-cm pot containing one *Ageratum* 'Blue Puff' plug (2 seedlings/plug). Plants were started in a shadehouse (50% shade) for 2 weeks then moved to full sun for 7 weeks until finished. Plants grown in all media combinations without fertilizer were not salable. Potting medium formulation had no significant influence on plant height, plant width, foliage color grade, root grade and plant grade. Verlite mix (100%) without Osmocote produced the poorest quality plants of all treatment combinations. Plants which ranked best for specific measurements or ratings were grown with the following rates of Osmocote (g/pot): plant height (2, 4, and 6 g), plant width (4 and 6 g), foliage color grade (6 g), flower number (2, 4, and 6 g), root grade (2, 4, and 6 g), and plant grade (6 g). The pH range of extract from 100% Verlite mix and 100% compost, before planting, were within a good range for plant growth. The conductivity of the extract from nonleached compost was high, but with dilution with other potting amendments and leached by overhead irrigation practice resulted in normal growth of ageratum. Results of this study indicate that the Orange County yard-waste compost is a suitable amendment to supplement peat-based media for use on at least one short term potted ornamental crop.**

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During the past decade there has been renewed interest in a variety of methods of recycling plant material from landscape maintenance operations. On-site recycling of grass clippings and shredded trimmings from woody plants for mulch or raw material for on-site composting operations is regarded as the most environmentally friendly pathway. In many urban areas, because of limited space for on-site recycling or tradition-based reliance on use of municipal trash collection services, residences and commercial properties continue to generate large volumes of yard trash which is collected by the county, municipality or contracted firms.

Several researchers have reported successful use of yard waste compost or blends containing yard waste compost in garden soil (Stephens and Kostewicz, 1992) and in potting media (Conover and Poole, 1990; Fitzpatrick and Verkade, 1991; McConnell, 1991; McConnell et al., 1990) for production of horticultural plants.

An extensive yard waste compost demonstration was conducted in Orange County, Florida, from fall of 1990 through Aug. 1992 (Reinhart et al., 1993) to study the compost process of the local yard waste from Orange County. Numerous chemical characteristics of the compost were measured. The composting process required approximately 90 days before the product could be utilized. Results of the compost demonstration regarding its potential use as a garden soil additive were positive.

The present yard waste composting procedure at the Orange County Landfill involves curbside collection of grass clippings, small limbs, weeds and similar plant debris and transporting it to the Orange County Landfill on Young Pine Road, Orlando. The material is offloaded onto a large blacktop-paved surface where the plastic film from bagged material is removed. The remaining material is shredded, moved, and configured into long windrows approximately 2 m high and 4 m wide. The windrowed material is turned and reconfigured every 7 to 10 days. Moisture is added occasionally to assure maximum composting rate and high composting temperatures within the piles.

When the intent of composting yard waste collected on a large scale is to produce a compost for use in high quality greenhouse potting media, it is necessary to test the finished product with crop plants before it can be recommended for that use, which is the basis for the experiment reported in this paper.

Materials and Methods

An experiment was initiated at the Central Florida Research and Education Center in Apopka to test the suitability of Orange County yard-waste compost as a potting medium amendment for bedding plant production. Potting components were Verlite Nursery Mix A (Verlite Company, Tampa, FL) and Orange County compost (Recycle America, Orlando, FL). The contents of Verlite Container Mix A are: Canadian sphagnum peat, coarse vermiculite, perlite, starter charge of major and minor essential elements, and a wetting agent, in a proprietary blend. The volumetric ratios of components in the experiment were 100:0, 75:25, 50:50, 25:75, and 0:100, for Verlite Nursery Mix A and Orange County compost, respectively.

Since ageratum is considered relatively sensitive to high soluble salts in the root zone, it was selected for the experiment. Plugs of *Ageratum* L. 'Blue Puffs' (390 2-seedling plugs per tray) were potted 19 Feb. 1993 in 12-cm (diameter) by 9 cm (deep) round pots, one plug per pot. Fertilizer treatments included Osmocote™ (GraceSierra Co., Milpitas, CA) 14N-6P-11.6K (14-14-14) at the rate of 0, 2, 4, and 6 g per pot as a top-dressed application to five replications of each potting medium blend. Plants were placed in a plastic-film-lined shadehouse (50% shade) for early establishment and cold protection. Temperatures ranged between 10°C and 27°C in the shadehouse. After two weeks the plants were moved to an outdoor growing area (full sun) and placed on black, woven polypropylene ground cover. Except for a cold period during 13 to 15 Mar. when the plants were moved back into the shadehouse, they remained outdoors where they were irrigated overhead.

Plant measurements made 7 Apr. included plant height, plant width, foliage color grade, flower number, root grade, and plant quality grade. Fresh Verlite Nursery Mix A and compost were tested for pH and electrical conductivity (saturated paste extract) and percolation rate.

Results and Discussion

Initial plant growth was rather uniform among treatments, except for plants in 100% Verlite mix without fertilizer, which grew slower than plants in all other treatments. Plant height and width main effects were not significantly influenced by potting medium blend, but fertilizer rates of 4 and 6 g produced significantly larger plants than the other treatments (Fig. 1 and 2).

There was a positive interaction of potting medium blend (75:25 and 50:50, commercial mix and compost, respectively) and fertilizer rate (2, 4, and 6 g) on the number of inflorescences per plant (Fig. 3).

The primary influence on foliage color was fertilizer, with plants at the 4 and 6 g rate having the darkest green leaves (Fig. 4). There was a mistake in data recording which resulted in high and low values for plants without fertilizer in the 100:0 and 75:25 ratio blends (commercial blend and compost treatments, respectively).

The main effects of potting medium blend on root grade were not significant, but fertilizer rates of 2, 4, and

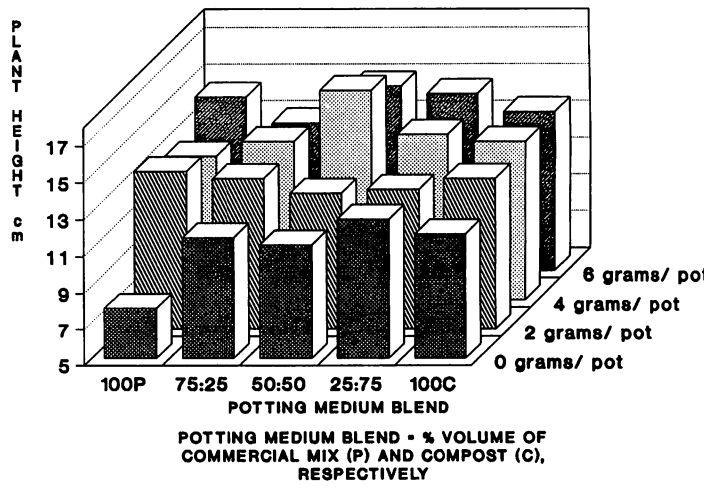

Fig. 1. Influence of ratio of commercially prepared potting medium to compost and fertilizer level (14-14-14) on height of *Ageratum* 'Blue Puffs'.

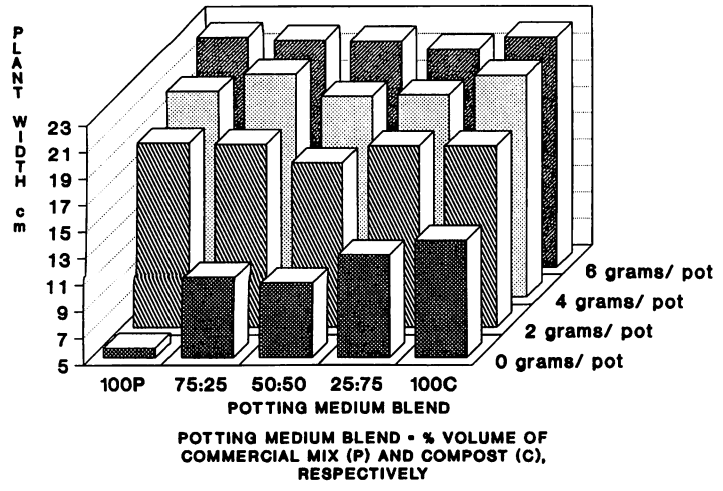

Fig. 2. Influence of ratio of commercially prepared potting medium to compost and fertilizer level (14-14-14) on width of *Ageratum* 'Blue Puffs'.

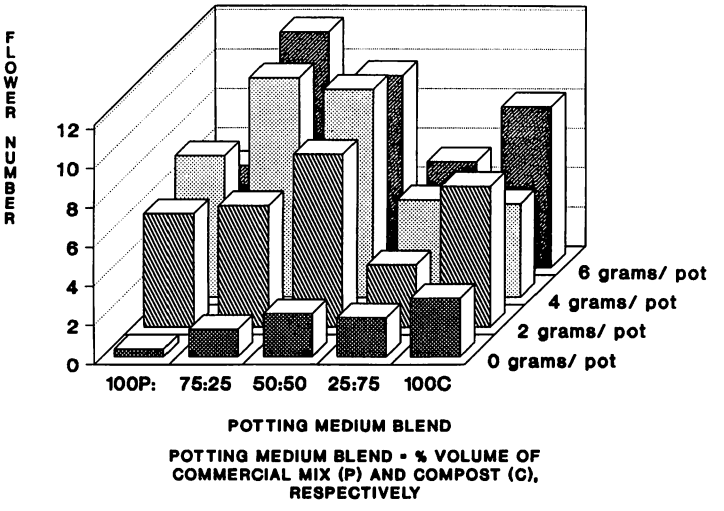

Fig. 3. Influence of ratio of commercially prepared potting medium to compost and fertilizer level on flower number of *Ageratum* 'Blue Puffs'.

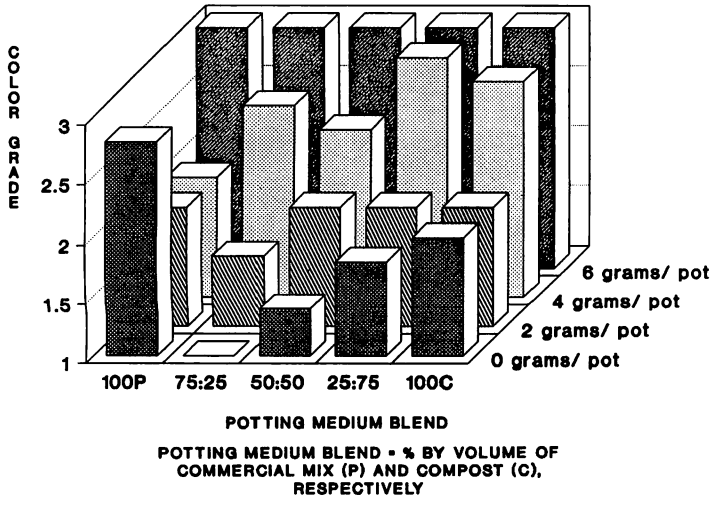

Fig. 4. Influence of ratio of commercially prepared potting medium to compost and fertilizer level on foliage color grade of *Ageratum* 'Blue Puffs' (color grade: 1 = light green, 3 = medium green, and 5 = dark green).

6 g per pot produced plants with root grades significantly higher than plants grown without fertilizer (Fig. 5). Treatments without fertilizer had higher root grades as the proportion of compost in the blend was increased through 100 percent. Conversely, plants which received the 6 g fertilizer rate had progressively better root systems as the proportion of commercial mix was increased in the blend. It appeared that the compost provided some nutrients to plants which were not fertilized. The decrease in root grade observed as fertilizer application rates and proportion of compost increased was probably due to high cation exchange capacity and residual nutrients contributed by the compost.

Potting medium blend main effects had no significant influence on plant grade, but there were significant differences with each added increment of fertilizer (Fig. 6).

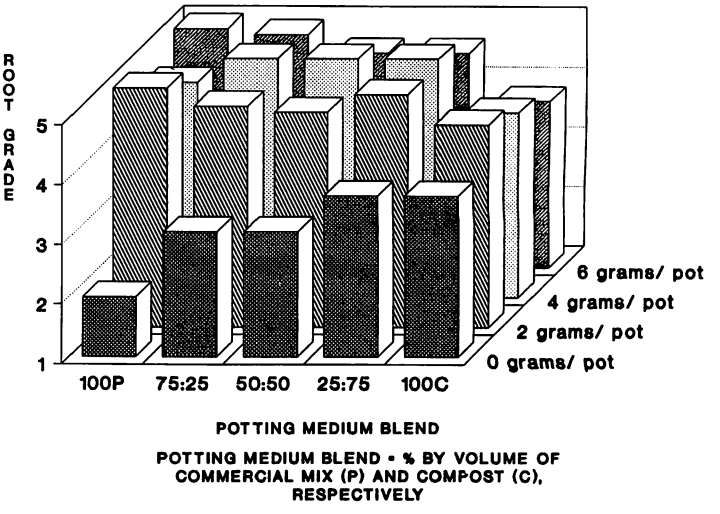

Fig. 5. Influence of ratio of commercially prepared potting medium to compost and fertilizer level on root grade of *Ageratum* 'Blue Puffs' (root grade: 1 = very few roots developed at surface of container, 3 = acceptable root system, more than 50% of outer surface of root ball covered with roots, and 5 = dense root development around most of the root ball).

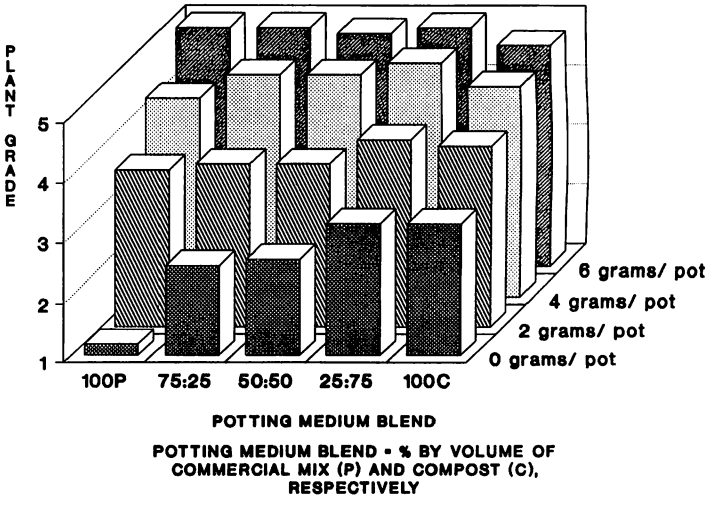

Fig. 6. Influence of ratio of commercially prepared potting medium to compost and fertilizer level on plant grade of *Ageratum* 'Blue Puffs' (plant grade: 1 = very poor quality, not salable, 3 = salable, but not outstanding, 5 = excellent quality, considering plant size, impact of flowers, and degree of root development).

Potting medium extract tests conducted on fresh materials indicated that the commercial mix and compost had pH values within an optimal range for growth of most plants (Table 1). The mean conductivity value for the commercial mix was acceptable while the compost value was somewhat high for sustained growth. Since the compost would normally be diluted with other potting mix amendments and the initial irrigation would leach some of the soluble salts from the blend, the compost appears to be safe for use as one component of a potting mix.

Preliminary evaluation of the rate of water infiltration and drainage of the commercial mix and compost indicates the rate of infiltration and drainage in compost is considerably less than in the commercial mix (Table 1). Based on this preliminary evaluation of potting medium drainage, it is probably not wise to use a high proportion of compost in a mix even though other components in the blend may drain well.

Table 1. pH, conductivity, and percolation rate of Verlite Nursery Mix A and Orange County compost. Values are means for 10 replicate samples.

Medium	pH	Conductivity (micromhos)[z]	Percolation rate (min/100 ml)
Verlite Nursery Mix A	6.6	911	6.0
Orange County compost	6.8	4514	10.5
Significance	NS	**	**

[NS, **]Nonsignificant or significant at P = 0.01, respectively.
[z]Media in 12-cm (diameter) by 9-cm (deep) round pots.

Results of this experiment indicate that the Orange County yard waste compost product evaluated is suitable to amend peat-based potting media for use on short term crops. Approximately 25-50% Orange County compost could be added to some commercially prepared peat-based potting mix without adverse effects on ageratum and probably many other short term crops in small containers. If the compost is to be used for crops to be grown on subirrigation systems, it is recommended that the compost or the blend containing compost be leached prior to planting or immediately after planting to reduce the initial soluble salts level. Due to its poor percolation capability it may be a poor choice, if use in amounts exceeding 50% by volume, for container-grown plants outdoors where plants are subjected to periods of sustained rain.

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