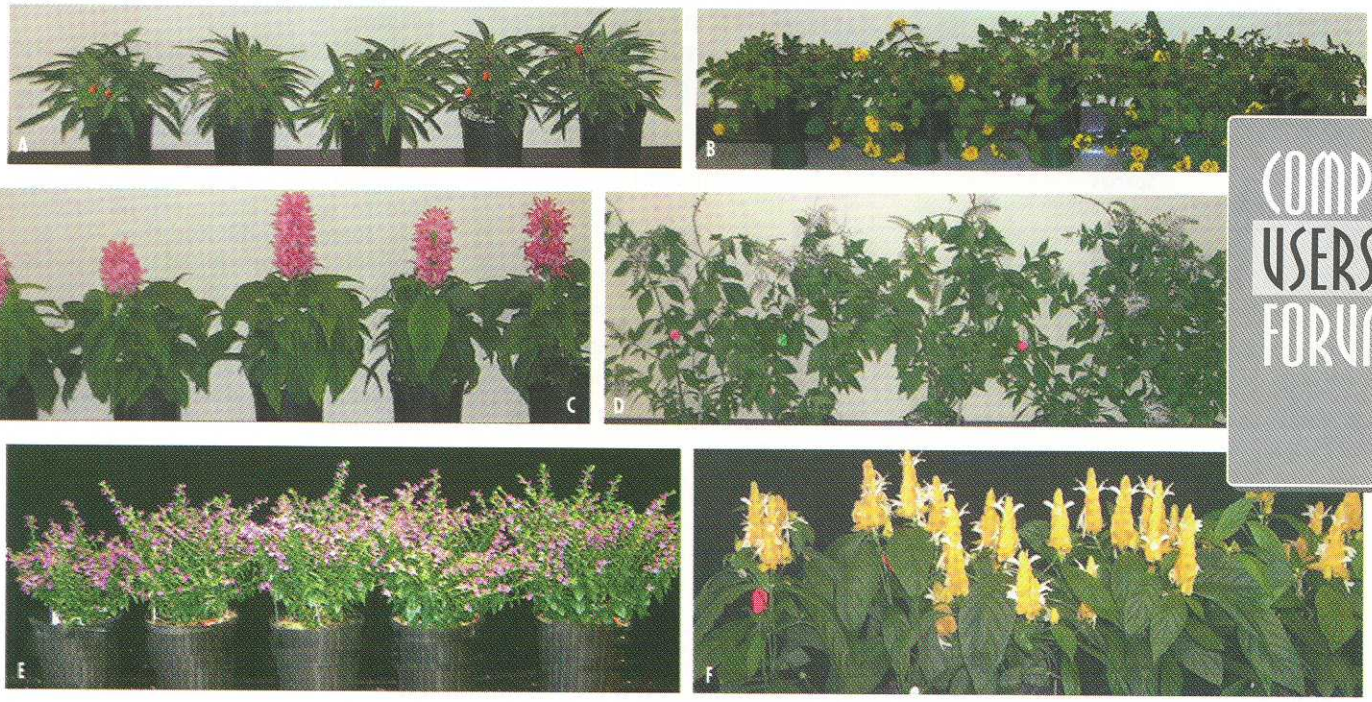

COMPOST USERS FORUM

Figure 1. Effects of compost-amended media on Bolivian sunset (A), golden globe (B), Brazilian plume (C), cat whiskers (D), Mexican heather (E), and golden shrimp plant (F). A commercial peat-based mix was amended with 100, 75, 50, 25, 0 (left to right, by vol.) yard trimmings/ biosolids compost.

Containerized Perennials Make Good Use Of Compost

Nursery industry, plants and environment benefit greatly when compost-amended media replace peat as substrate.

Sandra B. Wilson, Peter J. Stoffella and Laurie A. Krumfolz

A LARGE segment of the ornamental nursery industry depends on peat moss as a major constituent of their potting media. The physical and chemical characteristics of peat have made it an excellent potting media for a variety of ornamental plants. However, in recent years, environmental concerns and the cost of peat have escalated. In addition, many states have mandated laws to reduce waste inputs, particularly organic residuals going to municipal landfills.

To achieve this, the focus has been primarily on recycling and use of commercial compost produced from yard trimmings and other organic feedstocks including treated biosolids. Compost (biosolids/ yard trimmings) has been utilized to successfully grow a wide range of crops including bedding annuals, vegetables, woody shrubs and trees, and foliage plants. University of Florida (UF) researchers are now determining the practicality of using biosolids/ yard trimming compost for containerized perennial plant production.

Results suggest that compost can be a viable partial alternative to peat as a substrate for containerized herbaceous perennial production. At UF, growth of ten perennials was evaluated using commercially available peat-based soilless media amended with 25 percent, 50 percent, or 75 percent compost generated from biosolids and yard trimmings. Initial findings showed that media amended with 25 percent or 50 percent compost significantly reduced plant size of Mexican heather and cat whiskers, respectively (Table 1). Angelonia and golden shrimp plants could be grown in media with up to 75 percent compost without significantly reducing plant size. Regardless of the plant species tested, the higher compost amendments

Table 1. Shoot dry weights (g) of selected perennial plants grown in a commercial peat-based media amended with 0, 25, 50, 75, or 100 percent (by vol.) yard trimmings/biosolids compost.

Species		Compost(%)				
Common Name	Scientific Name	100	75	50	25	0
Cat whiskers[z]	*Orthosiphon stamineus*	19.4*	15.4*	23.3[NS]	26.0[NS]	27.7
Angelonia[z]	*Angelonia angustifolia*	5.08*	7.02NS	5.32[NS]	7.38[NS]	8.17
Mexican heather[z]	*Cuphea hyssopifolia*	10.1*	11.1*	14.1*	16.4*	19.6
Golden shrimp plant[z]	*Pachystachys lutea*	11.8*	14.2NS	16.4[NS]	16.1[NS]	16.8
Bolivian sunset[y]	*Gloxinia sylvatica*	13.0*	13.3*	14.2*	13.7*	23.0
Golden globe[y]	*Lysimachia congestiflora*	17.3*	20.5NS	18.7[NS]	18.8[NS]	19.7
Brazilian plume[y]	*Justicia carnea*	14.9[NS]	17.7NS	17.9[NS]	14.9[NS]	17.7
Black and blue salvia[x]	*Salvia guarantica* 'Black & Blue'	4.75*	–	9.14[NS]	–	10.8
Indigo spires salvia[x]	*Salvia* x 'Indigo Spires'	14.5[NS]	–	17.1[NS]	–	16.7
Wine sage[x]	*Salvia* 'Van Houttei'	11.1[NS]	–	12.3[NS]	–	11.9

*Comparisons were established between peat-based mix (0% compost) and other individual treatments within each row (NS=nonsignificant, *= significant at P£0.05).*
[z]Plants were grown in a peat-based commercial soilless mix amended with 25, 50, or 75% compost.
[y]Plants were grown in a 1:1 ratio of perlite and vermiculite amended with 25, 50, or 75% compost; the 0% compost treatment was a peat-based commercial soilless mix.
[x]Plants were grown in a peat-based commercial soilless mix amended with 50% compost and sub-irrigated in an ebb and flow system.

(75 or 100 percent) did not affect flowering or visual quality and plants were still considered marketable.

Based on these findings, a second series of experiments was conducted to improve the physical properties of compost-based media. Growth of Bolivian sunset, Brazilian plume, and golden globe transplants was evaluated in a vermiculite/perlite media containing 25 percent, 50 percent or 75 percent compost (also derived from biosolids and yard trimmings) as compared to commercial peat-based media. Again, the effects of media composition on plant growth and development varied with each species tested. Bolivian sunset plants were smaller with reduced flower development (but still of high visual color and quality) when grown in media amended with as little as 25 percent compost. Golden globe plants could be grown in media with up to 75 percent compost without significantly reducing plant size. Brazilian plume plants were similar in size when grown in compost-based media as compared to peat-based media and flower development was unaffected. However, the visual color and quality of the plants suffered somewhat when plants were grown in compost alone (Figure 1).

Based on these findings, it appeared that improving the physical properties of the media was beneficial when growing plants in up to 75 percent compost, but compost alone was still not an acceptable alternative to using commercial soilless mix. Results indicated that 100 percent compost hardened in the pot after time, making it difficult for water to penetrate the substrate. When the root distribution was analyzed from plants grown in unamended compost, it was discovered that the roots grew abnormally close to the circumference of the pots. This suggested that the method of irrigation may improve growth of plants raised in high volumes of compost.

With this in mind, UF researchers conducted a third series of investigations comparing hand-watering, sub-irrigation and drip irrigation of three salvia species grown in 50 percent or 100 percent compost as compared to commercial peat-based media. Results of the sub-irrigation experiment showed no difference in plant size when plants were grown in peat-based media or 100 percent compost for Indigo spires salvia and Wine sage. However, black and blue salvia were significantly reduced when grown in compost alone as compared to peat-base media. For this salvia species, a 50 percent soil amendment of compost is recommended if subirrigating. ■

Sandra B. Wilson, Peter J. Stoffella, and Laurie A. Krumfolz are with the Indian River Research and Education Center, University of Florida. A full report of their studies using compost-amended media for growth of Mexican heather was published in the Winter 2001 issue of Compost Science & Utilization, published by The JG Press.

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