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EVALUATION OF LOOSE ROCKWOOL AS A GROWING MEDIUM FOR GERANIUMS: COMPARISON WITH PEAT-LITE AND SOIL MIXES

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Loose rockwool (Hortiwool) was investigated as a potting medium for 'Yours Truly' geranium *(Pelargonium hortorum)* under commercial greenhouse conditions. Fresh and dry weights, leaf area, and flowering of rockwool-grown geraniums were comparable to those grown in commercial peat-lite and soil mixes. Loose rockwool without amendments can be adapted as an effective potting medium for the greenhouse production of geraniums when a constant nutrient feeding program is used.

INTRODUCTION

Previous work indicated that rockwool amendments with peat and vermiculite were suitable for the production of pot plants (Hanan, 1983). Loose rockwool, without amendments, was also found to be suitable for growing cut flowers (Hanan, 1986; Lee *et al.*, 1986) and selected flowering pot plants, including Easter lily (Goldsberry and Maffei, 1986), chrysanthemum (Lee *et al.*, 1987a), and poinsettia (Lee *et al.*, 1987b). The objective of this study was to investigate the feasibility of using a loose form of rockwool as the sole source of root substrate for production of potted geraniums.

MATERIALS AND METHODS

Performance of loose rockwool (Hortiwool, product of Fibrex) was compared with geranium plants grown in peat-lite mix (Sunshine No. 2) and a soil mix (1 part soil: 2 parts peat: 1 part perlite). Rooted cuttings of 'Yours Truly' geranium were potted in 4.25 in. plastic geranium pots (one plant/pot) and drenched with Banrot on 11 Oct. 1986. Plants were watered the first two times without fertilizers. Plants were then hand-irrigated, as needed, with 200 ppm N, 88 ppm P, and 166 ppm K, using Peters 20-20-20 fertilizer as a constant feed throughout the growing period. The pH of the irrigation water ranged from 6.5 to 6.8. Plants were pinched on 28 Oct. 1985, leaving 4 nodes. Plants were grown in raised benches in a fiberglass (FRP) house from 10 Oct. 1985 to 20 Feb. 1986. The greenhouse temperatures during this production period fluctuated from 19°C night to 19°-24°C day (heated to 19°C, cooled at 24°C).

A total number of 144 plants (6 pots/unit × 3 media × 8 replications) were used with a completely randomized design, with each observation unit as a row running across the bench. Also, 12 pots as guards were used for the two end rows. Plants were initially spaced 20 cm × 20 cm (center to center), and later, 30 cm × 20 cm during blooming period. One-half of the plants (total 72 plants, or 3 plants per unit) were harvested on 20 Dec. 1985, and the other half on 27 Jan. 1986, for growth measurements.

RESULTS

Growth, including plant height, canopy width, stem diameter, number of flowers, total leaf area, and fresh and dry weights, was determined for plants in each growing medium **(Table 1).** The initial plant growth (Dec. 20 measurements) was less in rockwool and peat-lite media, as compared to that in the soil mix. As plants became more established, the differences in the growth of plants in the three growing media changed (Jan. 27 measurements). The leaf area of the soil and rockwool grown plants was similar and significantly larger than that of the peat-lite grown plants.

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The dry weight of the soil grown plants was the greatest, and the peat-lite grown the lowest; however, the plants grown in rockwool did not differ significantly from them. Visually, the size and quality of plants grown in the 3 different media were indistinguishable **(Fig. 1).** Plants grown in rockwool produced as many flowers as peat-lite or soil grown plants **(Table 1).**

Rockwool grown plants produced thicker and shorter roots **(Fig. 1)** as compared to the soil or peat-lite grown plants. Often, the roots of geraniums in rockwool grew out of the medium, showing numerous white root tips exposed on the medium's top surface. The browning and death of roots growing out of the surface of the medium were frequently observed in both rockwool and peat-lite mix. Throughout the experimental period, algae growth was noticed on the wet surface of rockwool; however, it did not seem to adversely influence the health of the plants.

DISCUSSION

The results of this study indicated that proper watering practices are essential for the healthy growth of geraniums in rockwool. Care must be taken not to keep the rockwool medium too wet during initial growth of plants. This problem may be corrected by using a mixture of wettable and hydrophobic rockwool materials. Since rockwool has little nutrient holding capacity, it is recommended that the fertilizer application start immediately following potting. Water retention and aeration characteristics have been studied for rockwool blocks (Verwer and Welleman, 1981; Willumsen, 1972), but not for loose rockwool. Further research is needed to optimize watering and nutrient requirements of the loose and granular forms of rockwool for flowering pot plant production. The mechanical potting of loose rockwool is difficult especially when pot sizes are small. The granulated forms of rockwool, which were found to be easily adapt-

Table 1. Influence of 3 different potting media on growth and flowering of 'Yours Truly' geranium[1].

	Growing Media								
	Soil Mix			Peat-lite			Hortiwool		
Plant Height (cm)									
Dec. 20	24.4	±	2.8a	22.3	±	2.5b	22.6	±	2.6b
Jan. 27	26.8	±	3.7a	24.8	±	3.4a	26.4	±	6.0a
Plant Width (cm)									
Dec. 20	31.3	±	4.3a	28.2	±	2.4a	29.0	±	4.5a
Jan. 27	37.2	±	4.6a	33.8	±	4.3a	35.4	±	8.6a
Stem Diam (mm)									
Dec. 20	11.0	±	1.2a	10.8	±	1.2a	10.0	±	1.1a
No. Unopen Florescence									
Dec. 20	3.4	±	1.2a	3.8	±	1.2a	3.5	±	1.1a
Jan. 27	4.6	±	1.1a	4.7	±	1.1a	4.5	±	0.6a
No. Open Florescence									
Jan. 27	2.5	±	1.1a	2.6	±	1.1a	2.8	±	1.3a
Fresh Weight (g)									
Dec. 20	96.6	±	12.9a	81.1	±	14.5b	73.3	±	14.1b
Jan. 27	223.7	±	38.7a	190.3	±	38.0b	211.8	±	28.6ab
Leaf Area (cm^2)									
Dec. 20	817.8	±	143.8a	667.5	±	115.5b	607.6	±	130.0b
Jan. 27	1427.2	±	256.0a	1173.8	±	241.0b	1367.2	±	193.0a
Dry Weight (g)									
Dec. 20	17.0	±	5.0a	14.6	±	2.9ab	13.3	±	1.9b
Jan. 27	36.2	±	5.6a	33.5	±	3.1b	35.2	±	2.8ab

[1]Data presented as mean ± SE. Mean comparisons among the growing media were made in each line separately by Duncan's multiple range test at the 5% level.

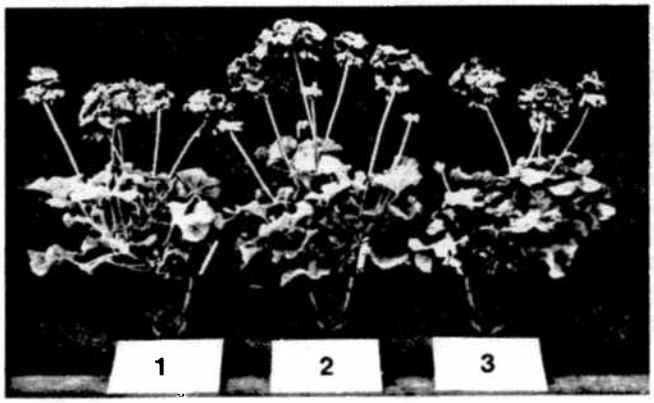

Fig. 1. Flowering 'Yours Truly' geranium plants grown in peat-lite mix (1), loose rockwool (2), and soil medium (3).

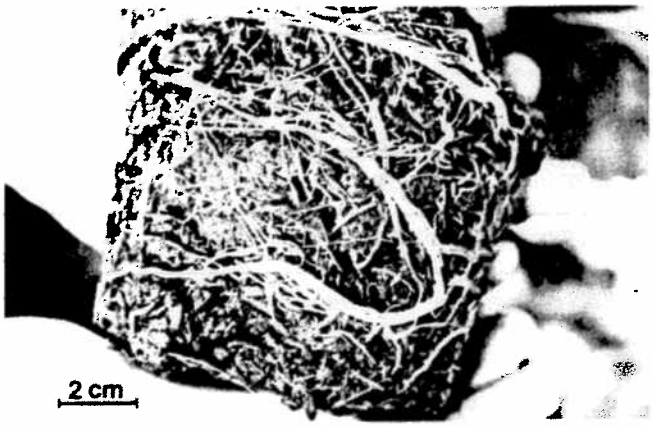

Fig. 2. Characteristics of geranium root system developed in the loose rockwool medium.

able to automation, deserve further investigation as growing media for potted flowers and bedding plants grown in cell packs and plugs.

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