SOIL MEDIUM TEST FOR CONTAINER-GROWN EUCALYPTUS VIMINALIS

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Present technology dictates that *Eucalyptus* seedlings be container grown and planted as a plug with soil and root mass intact. Since the first 8 to 12 weeks of a seedling's establishment may be important to its performance when later outplanted, it is desirable to provide optimum root media for container growth. The objective of this study was to determine the relative productivity of *E. viminalis* seedlings grown in various mixtures of commercial soil media.

Methods

Three Todd® seedling trays, each with 72 2-inch square cavities, were placed side-by-side in the greenhouse. The exterior row of cavities was filled with a 1:1:1 mixture of sand, topsoil, and peat to act as a buffer row. One hundred and fifty-six of the internal 160 cavities were each filled, on a random basis, with one of 13 treatment mixtures; each treatment was replicated 12 times with the remaining four cavities filled with the buffer row mixture.

Treatments consisted of different ratios of peat moss, vermiculite, Micro-Lite® (a naturally occurring source of trace minerals and micronutrients) and Redi-Earth® (a mixture of vermiculite and peat moss with some nutrients included). A 2-week-old *E. viminalis* seedling was transplanted from a germination tray into each cavity. All seedlings were fertilized every 2 weeks with a water soluble fertilizer equally over all soil media.

At age 10 weeks, seedlings were measured for total height and six seedlings were randomly chosen from each treatment; the root medium was washed away, and both total weight and weight of aboveground portion were recorded. Statistical analyses of total height, total weight, and top weight were performed.

The remaining six seedlings from each treatment were outplanted in a completely random design on September 22, 1975. Seedlings were planted at an 8-by 8-foot spacing, disk-cultivated during 1976, and measured at time of outplanting, after 1 year, and after 2 years.

Results and Discussion

Soil mixtures tested are shown in table 1. The seedling height, total weight of the washed root seedling, and the weight of the seedling above root-collar are shown in table 2. In each case, treatment 2 was superior although not significantly better than the next treatment. Treatments 1, 2, 3, and 4 contained varying amounts of peat moss, vermiculite, and Redi-Earth® and produced above average seedlings.

Table 1.—*Treatment mixtures used in tray cavities*

Treatment number	Peat moss	Vermic-ulite	Redi-® Earth'	Topsoil 1/3, sand 1/3, peat 1/3	Micro-Lite® [2] [3]
1	1/3	1/3	1/3	0	0
2	1/4	1/4	1/2	0	0
3	1/2	1/4	1/2	0	0
4	1/4	1/2	1/4	0	0
5	0	1/2	1/2	5	0
6	0	1/2	1/2	15	0
7	0	1/2	1/2	25	0
8	0	1/3	1/3	5	?
9	0	1/3	1/3	15	?
10	0	1/3	1/3	25	?
11	0	0	0	5	1
12	0	0	0	15	1
13	0	0	0	25	1
Buffer row	0	0	0	0	1

[1]Super Supplement, Inc., Kansas City, Missouri.
[2]W. R. Grace & Co.
[3]Percent of other mixture by volume.

The six seedlings grown in each soil medium and outplanted in September 1975 did not grow well. Mortality of the young succulent seedlings was heavy the first winter when 34 freezing nights (20° F to 32° F) were recorded. Succulent Eucalyptus seedlings would not normally be planted in early winter as was done in this trial. Unfortunately, all seedlings from treatment 2 are now dead and there appear to be few trends correlating present tree size with original seedling size.

Summary

A growing medium of peat moss, vermiculite, and Redi-Earth® produced an *E. viminalis* seedling satisfactory for field outplanting in 10 weeks. Increasing amendments of Micro-Lite® did not stimulate growth of seedlings. The 1:1:1 mixture of topsoil, sand, and peat did not produce adequate seedlings.

Table 2.—*Duncan's test for significant differences[1] applied to total height, total weight, and top weight of 90-week-old seedlings, by soil treatment*

Treatment	Height	Treatment	Total weight	Treatment	Top weight
	inches		*grams*		*grams*
2	11.39	2	2.59	2	1.87
3	9.72	4	1.97	4	1.37
9	9.68	3	1.59	3	1.20
5	9.39	9	1.55	9	1.15
1	9.34	5	1.37	5	1.03
8	9.25	1	1.25	1	.92
4	9.12	11	1.02	11	.78
10	8.68	8	.97	8	.70
11	8.49	6	.92	6	.63
6	7.73	10	.90	12	.58
12	7.16	12	.86	7	.57
7	6.89	7	.72	10	.54
13	6.76	13	.35	13	.22

[1]Means not connected by the same line are significantly different at the *95* percent confidence level.