

# TECHNICAL NOTES

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TN-PLANT MATERIALS-63

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## **SOIL QUALITY IMPROVEMENT USING WORM CASTINGS AND IT'S EFFECTS ON PROPAGATION OF CONSERVATION PLANTS**

### ABSTRACT

This study evaluated the effects of using different amounts of worm castings in the growing medium used to propagate various conservation plants. The study determined that worm castings provide improved plant height growth of beardless wildrye, purple needlegrass and California buckwheat compared to growth media and fertilizer alone.

### INTRODUCTION

Soil quality improvement using worm castings is both beneficial to sustainable agriculture and waste management. Using vermaculture to recycle organic urban and agricultural waste is beneficial in that fewer demands can be placed on natural resources. The use of worm castings can reduce commercial fertilizer use and increase soil organic matter, both of which should result in less global warming.

### METHODS AND MATERIALS

A randomized block design with three replications was used with three treatments and one control. 'Duro' California buckwheat – *Eriogonum fasciculatum*, 'Rio' beardless wildrye – *Leymus triticoides* and LK115d Purple Needle Grass – *Nassella pulchra* were propagated on 3-15-2000 using ten seeds per Deepot™ container. Each Deepot™ container was placed in the Lockeford PMC greenhouse. During the 115-day plant growth period, the greenhouse did

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not use artificial lighting and the cooling system was activated at 76 degrees F. The growing medium contained 80% Canadian sphagnum peat moss and 20% other: perlite, vermiculite, dolmitic and calcitic limestone and a wetting agent. The worm castings used were produced by commercial vermiculture companies.

Twelve grams of Osmocote 18-6-12 slow release fertilizer was applied to each Deepot™ container two weeks after emergence. Three rates of worm castings were used with one control: 1/3 worm castings, (105.6 grams of worm castings and 67.2 grams of growing medium); 2/3 worm castings, (211.2 grams of worm castings and 33.6 grams of growing medium); all worm castings, (316.8 grams of worm castings); growing medium only, (100.8 grams). All plants in the three treatments and control were evaluated on July 10 2000.

## RESULTS AND DISCUSSION

'Duro' California buckwheat exhibited excellent growth at the 2/3-worm casting treatment level. 'Rio' beardless wildrye showed excellent growth when all worm castings were used. LK115d Purple Needle Grass presented gradual growth increases with increasing quantities of worm castings and the all worm castings treatment demonstrated good performance when compared to the control.

## CONCLUSION

Vermiculture worm castings were successful in increasing California native plant growth in a greenhouse setting. These evaluations show potential for the increased use of worm castings in sustainable agriculture.

Table 1. Evaluation of Plants by Treatments.

<u>Variety</u>	<u>Treatment</u>	<u>Average Height (cm)</u>
'Duro'	1/3	3.30
	2/3	14.48
	All	7.62
	Control	10.16
'Rio'	1/3	38.1
	2/3	43.94
	All	49.02
	Control	42.16
LK115d	1/3	25.4
	2/3	26.92
	All	27.94
	Control	23.62