EFFECT OF COMPOSTED HARDWOOD BARK AND PEAT CONTAINER MEDIA ON GROWTH OF SELECTED ERICACEOUS PLANTS[1]

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Abstract. Hardwood bark compost proved to be an excellent container-growing medium substrate for production of *Pieris japonica* and *Rhododendron* 'Nova Zembla' and 'Roseum Elegans'. Growth indices and root growth ratings were greater for test plants produced in a composted hardwood bark-sand medium than for plants produced in Michigan peat-sand and Michigan peat-sand-Haydite media. Some root rot caused by *Pythium irregulare* was observed on all plants grown in peat-sand and Haydite-peat-sand media, but not on plants grown in bark compost. Increased root growth in the bark-sand medium may be due in part to the absence of root rot.

Composted hardwood bark has physical and chemical properties that appear to make it an excellent substrate for container plants. It is relatively low in weight, provides adequate drainage and has an ion exchange capacity similar to that of peat. It contains all minor elements required for plant growth (2). In addition to these excellent chemical and physical properties, composted hardwood bark also is free of plant pathogens (4). Furthermore, evidence shows that this compost suppresses *Phytophthora* root rots (5) and nematode diseases of susceptible plants (6).

In a previous but small-scale study, growth of *Rhododendron* 'Roseum Elegans' in a hardwood bark compost was compared with that in two peat media (3). We report here the growth differences of *Pieris japonica* and *Rhododendron* 'Nova Zembla' and 'Roseum Elegans' in a large-scale trial. Growth media included: i) a composted hardwood bark; ii) a Michigan peat-sand and iii) a Haydite-Michigan peat-sand medium. The bark medium contained 2 parts bark and 1 part silica sand with 6 lbs. ammonium nitrate, 5 lbs. superphosphate and 3/4 lbs. elemental sulfur per cubic yard. The peat medium contained 15 lbs. dolomitic lime, 5 lbs. superphosphate, 1 lb. GU-49 (63% iron oxide) and 1 lb. fritted trace elements per cubic yard. The peat-sand medium consisted of 2 parts Michigan peat and 1 part sand (v/v). A hammermilled hardwood bark received from Pallet-All Corp., Millersburg, Ohio was also evaluated. However, because of the lack of uniformity of this latter product, growth data are not presented. All media were mixed with a flail-type manure spreader and stockpiled for 6

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[1]Approved for publication as Journal Article No. 138-75 of the Ohio Agricultural Research and Development Center.

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weeks. The composted bark medium was turned once after 3 weeks.

Plants (140 one-quart-plants/treatment) were potted May 20, 1974 in 2-gal green-colored containers and arranged in contiguous blocks in an uncovered polyhouse. The pH readings at the time of potting of the bark, peat, and the Haydite media were 5.2, 5.9 and 5.8, respectively. Percentage drained airspace (1) of the media were 20, 15 and 25 and soluble salts readings were 2.2, 0.20 and 0.26 millimhos/cm (1 part soil in 2 parts water, v/v), respectively. A reading of 1.8 is considered undesirable for many plants. The high salts reading of the compost indicates that the composting process had not been completed. Evergreen hardy azalea 'Boudoir' plants originally planned for this experiment died within a few days after potting in the bark mix due to high salts. Azaleas are not discussed further here but have grown successfully in composted hardwood bark, which had stabilized before potting.

At the end of the second growing season properties of the bark, peat and Haydite media were as follows: i) pH 5.4, 6.4 and 6.3, ii) soluble salts 0.1, 0.2, and 0.1 millimhos/cm and iii) air-drained pore space 18, 13 and 14%, respectively. The low soluble salt readings reflect the low nutrient levels maintained in this experiment. The high air-space in the bark mix as compared to the other mixes after two growing seasons demonstrates the resistance of hardwood bark to further breakdown after composting.

In September 1975, a growth index was determined of a randomly-selected number of plants (15/treatment). The growth index represents one-half of the sum of plant height and maximum plant width (cm). The number of flower buds per rhododendron plant and the number of inflorescences per pieris plant were also counted. Root growth ratings, made by a group of nurserymen and the authors, were on a scale of 1=poor, 2=fair, 3=medium, 4=good and 5=excellent sized root ball. A rating of five was assigned to roots that had filled the entire 2-gal pot. The average rating is based on four ratings of five randomly-selected plants per treatment. Because of the size of the project, replication and randomization of treatments was impossible. Therefore, data have not been subjected to statistical analysis.

Throughout the 2-yr period, plants in the bark medium appeared to be growing at a faster rate than those in the peat or Haydite media. However, considerable variability existed among plants in each medium. Growth indices of pieris plants in the bark, peat and Haydite media ranged from 28-47, 17-34, and 24-33 cm, respectively, and for 'Roseum Elegans', 46-67, 49-66, and 41-55 cm. Numbers of inflorescences ranged from 0-15, 0-7, and 0-7 on pieris plants in the bark, peat and Haydite media, respectively. Bud counts on 'Nova Zembla' ranged from 6-11, 4-8, and

4-13; for 'Roseum Elegans' 0-8, 0-6, and 0-8, respectively. The average number of inflorescences, the growth indices for each plant and root growth in the three media are presented in Table 1. Although all three plant types responded best in the bark medium, growth of pieris in the bark medium was almost 50% greater than in the peat or Haydite media. The increased top growth of 'Roseum Elegans' in the bark medium perhaps was insignificant but root growth was considerably better. Some root rot caused by *Pythium irregulare* was observed on all plants in the peat and the Haydite media but not in the bark. The increased root growth of all plants in the bark mix, therefore, could be due to the absence of *Phythium* root rot.

In a previous publication (3) we reported the increased growth of 'Roseum Elegans' in the bark medium as compared to other media. It now appears that hardwood bark compost is an excellent substrate for production of other ericaceous plants as well.

Acknowledgement. We wish to thank James Sabo and Dick Hart from Cottage Gardens, Inc., Perry, Ohio for supervision of plants througout the two-year period. In addition we thank David R. Dugan, R. James Schroeder and Jeff Henrietta for assisting in the rating of plant growth and Dr. James Q. Aylsworth for assistance in setting up the experiment.

Table 1. Effect of container medium on the average number of inflorescences per plant, average growth index and root growth rating.

Medium	Average Number Inflorescences			Average Growth Index			Average Root Growth Rating		
	PJ[1]	NZ[1]	RE[1]	PJ	NZ	RE	PJ	NZ	RE
Bark-Sand Compost	2.7	8.2	1.4	37	44	58	4	5	4
Peat-Sand	0.9	6.1	0.8	26	40	55	2	2	2
Haydite-Peat Sand	0.5	8.5	2.0	27	40	49	2	2	3

[1]PJ = *Pieris japonica*, NZ= 'Nova Zembla', RE = 'Roseum Elegans'.

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