The Use of Composted Rice Hulls in Rooting and Potting Media

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INTRODUCTION

By 1990 the demand for pine bark, the primary component of our growing media, had risen dramatically. Prices were increasing, and reduced availability became a real concern. Forrest Keeling Nursery sought alternative media components which would be readily available, cost effective, and support good plant growth. Much to our delight aged rice hulls found us. A rice hull is the sheath of the rice grain and is a waste byproduct in rice processing. Once separated the hull is run through a hammer mill having screens 3/16-in. sieve size. The milled hulls are then placed in piles which are composted for a minimum of 18 months. The hulls are then suitable for incorporation into media.

After preliminary comparison testing it became evident that aged rice hulls would support plant growth at least as well as pine bark. A side by side comparison was conducted between our conventional mix (80% pine bark 20% sand) and a mix of pine bark, rice hulls, and sand (2 : 2 : 1, by volume) with 2-gal liners shifted into 5-gal containers. Across the board the oaks, maples, ornamental pears, crabapples, locusts, and others did at least as well in the rice hull containing mix. In addition to the good plant performance, aged rice hulls compared favorably in terms of cost and were readily available.

PHYSICAL CHARACTERISTICS OF RICE HULLS

As received the physical characteristics of the composted rice hulls are as follows:

- A pH of 5.4 to 5.7 is typical among the samples evaluated.
- A porosity as we measure it is in the range of 30%.
- A water holding capacity of about 56% of the dry weight.
- A good balance between drainage and water holding capacity exists as determined by actual crop production. When starting with a dry rice hull containing mix, initial wetting is improved with surfactants.
- Rice hull particles range in size from less than 1 mm to about 3 mm. By weight about 70% of the rice hulls are 1 to 2 mm, with 10% larger and 20 % less than 1 mm.
- Contraction and expansion of media is negligible when compared to peat based mixes.
- Breakdown of rice hulls in media is minimal and is suitable for long term crops. This reduces the need to compensate for watering and fertilization due to media changes.

We have not measured cation exchange capacity (CEC) of this aged material. It is recognized that non-composted rice hulls have a low CEC. Whether the CEC of rice hulls increases with the aging process needs to be determined.

PLANT PERFORMANCE AND PEST PROBLEMS

We have to date observed that plants perform as well or better in mixes containing rice hulls, when compared to any mix not containing rice hulls which we have used. Specific observations include:

- Plants from seedling transplants, direct stuck cuttings, and bench grafts develop an excellent root structure.
- The incidence of damping-off seems to be reduced in a rice hull based mix.
- A rice hull based medium tends to dry at the surface which reduces moss and algae buildup.
- Fungus gnats while still present seem to be less common, and this is certainly an aspect which warrants further evaluation.

CONCLUSIONS

Composted rice hulls are a suitable substitute for pine bark throughout our production program. Rice hulls compare favorably with other media component choices based on direct cost, availability, and uniformity of the product. Based on our observations they may offer indirect savings from reduced microbial and insect pests, and certainly reduced cost when substituted for more expensive media components such as peat moss.