RICE HULLS VS PERLITE AND VERMICULITE AS A GROWING MEDIA COMPONENT

BY: CL Bethke Ph.D., April 1, 2007

Recently rice hulls have been promoted for use in growing media. They have been suggested as a replacement for vermiculite or perlite in blends. Claims have been made that rice hulls will perform many of the same functions as perlite or vermiculite and that rice hulls can replace perlite while not significantly influencing the management of the substrate. This is not accurate. If should always be remembered that changes of any components will have some influences on the blend. Physically, air porosity, available water, compaction, and water management will be altered. Chemically, pH, nutrient balance, nutrient holding (buffering) and fertilizer management will all be changed. Therefore, caution should always be exercised when altering a blend with rice hulls. Trials should always be run to determine the influence of a change on crop management and performance. This is especially true when using a product like rice hulls, which have a different influence than perlite or vermiculite when incorporated into a blend. Therefore growers should use great caution in considering rice hulls additions.

Attached is a chart comparing the characteristics of many popular growing media components. The properties of each component are considerably different and the influences on a blend are variable. Often the combined influence of two or more components (especially with similar size, and shape particles) will be far greater than the sum of the individual components alone. This is a kind of synergy where the total effect is greater than the sum of the parts. Therefore, growers should consider using similar size and shape particles with making additions or replacements.

Components like fine bark, some compost, and sawdust most closely compare with rice hulls. Spherical and angular components like perlite and vermiculite do not compare with rice hulls and the physical influences they perform in are considerably different. Perlite provides much more air porosity (volume for volume) compared with rice hulls while the water available to the plant is approximately the same. Vermiculite provides good air porosity and has a much higher nutrient holding ability than rice hulls while providing good available water reserves. In sphagnum based blends both perlite and vermiculite tend to increase the bridging between finer particles of peat thus increasing porosity and drainage. Because of the flatter shape of rice hulls much more must be used to give an effect similar to that of perlite. It has been said that rice hulls tends to "get lost" in the blend. In general by adding a higher percentage of rice hulls the porosity can also be increased but other properties may be adversely influenced. Also, nutrient management with rice hulls does not compare with vermiculite in a blend.

Often it costs more to achieve the goals when using cheaper components. Conducting a trial is always advised before making a significant change of components in your substrate. Remember that a good grower can produce a crop in nearly any substrate but the efforts required will increase considerably when using inferior components in a blend. It is usually far better to use quality components and spend a little more "up front" than to pay for it later. Always use reliable supplies of good ingredients to assure the best performance.

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A Comparison of Some Characteristics of Growing Media Components

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	Perlite *(medium)*	**Vermiculite** *(medium)*	**Rice Hulls** *Washed*	**Saw Dust** *Aged*	**Bark** *(fine)*	**Compost** *Variable*	**Sphagnum** *Peat*	**Coir** *Medium*
Dry Bulk Density	Low	Low	Medium	Medium	Medium	High	Low	Low
Wet Bulk Density	Medium	Medium	Medium	Medium	Medium	High	High	High
Influence on Air porosity	High	Medium	Low	Low	Low	Variable	Medium	High
Water Holding Capacity	Medium	High	Low	Low	Low	Variable	High	High
Nutrient Holding Capacity	Low	High	Low	Low	Low	Variable	Medium	High
pH	Neutral	Neutral	Neutral	Variable	Acidic	Alkaline	Acidic	Acidic
pH Buffering	Low	High	Low	Low	Low	Variable	Medium	High
Nutrient Contributions	Not Significant	K & Mg	Not Significant	Not Significant	Variable	Variable	Not Significant	K