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## Using Rice Hulls in Ornamental Horticulture

Rice hulls can be used as a substrate aggregate or as a top-dress to suppress liverwort and weed seed germination.

Most greenhouse growers use a peat-based substrate for growing their spring crops, however there is a trend towards using alternative substrates such as coconut coir, wood fiber, or parboiled rice hulls. Growers are continually looking to replace perlite in their growing mixes as perlite is a non-renewable, inorganic rock. Some growers are experimenting with using rice hulls in their substrate mixes while others use it to top-dress containers.

First, what are rice hulls? Rice hulls (or rice husks) is the protective covering of rice (Figure 1). The hulls are a by-product of the rice milling industry. Rice hulls can either be fresh or parboiled. Fresh rice hulls are the direct product after milling rice.



**Figure 1.** Fresh rice hulls are steamed to produce parboiled rice hulls (PBH) pictured here.  
Photo: Heidi Lindberg.

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Parboiled rice hulls (known as PBH) are steamed thereby killing any seeds remaining in the product (Figure 2). Whole rice hulls have a pH of 6.5 to 8.0 and are naturally high in silicon which decreases degradation. Similar to perlite, rice hulls increase the drainage and porosity of a substrate without causing significant nitrogen (N) immobilization or tie-up. Ground rice hulls can increase the pH, phosphorous (P) and potassium (K) levels in the substrate. Therefore, growers amending substrate with rice hulls need to be especially careful when using rice hulls as their pH (6.5 to 8.0) is substantially higher than the optimal range for most greenhouse crops, which is 5.8 to 6.2.

Instead of mixing rice hulls into the substrate, some nursery growers use rice hulls as a top-dress in order to reduce the germination of weed seeds and reduce the incidence of liverwort (Figure 3). Moss, algae, liverwort, and weeds tend to be a major problem in containers with herbaceous perennials or woody plants due to the very long crop time and the damp conditions throughout the dormancy of the plants. Rice hulls work to dry down the surface of the substrate and provide an inhospitable environment for weed seed germination. James Altland (a research horticulturist with the USDA-ARS Application Technology Research Unit in Wooster, Ohio) recently published an article, "[USDA tests rice hulls for weed control in container crops](#)" in January 2018 in *Nursery Management Magazine*. In their experiments, they top-dressed pots with 1, ½, ¼, or 0 inches of PBH in order to control liverwort (*Marchantia polymorpha*) and bittercress (*Cardamine exuosa*). A ½ inch or 1 inch mulch of PBH was 100% percent effective at liverwort and weed control. The ¼ inch mulch provided some suppression but not complete control.



**Figure 2.** Bulk container of parboiled rice hulls (PBH). Photo: Heidi Lindberg.



**Figure 3.** Rice hulls can be used as a top-dress in nursery production to reduce weeds, moss, liverwort, and algae on the growing media surface. Photo: Heidi Lindberg.



**Figure 4.** Blower system used by grower to apply parboiled rice hulls as a top-dress in finished production. Photo: Heidi Lindberg.

Therefore, growers of herbaceous perennials or woody plants who struggle with liverwort control or weed germination may want to try mulching the pots with rice hulls. The rice hulls can be applied during propagation on the transplant line or afterwards with a blower (Figure 4). The mulching depths that provided the best control (1/2 inch or 1 inch) are more applicable to larger container sizes (gallon, 3 gallon) and prove to be too deep in smaller propagation containers. However, nursery propagators are using light applications of PBH to suppress liverwort and weed growth (Figure 5).

When using PBH as a top dress, growers should note that there are a few challenges. Growers report that it is hard to tell if the flats or liners need watering because you can no longer see the surface of the substrate. In addition, if the PBH are applied inconsistently on the surface of a flat or liner, water from overhead irrigation may penetrate some cells and leave others completely dry. Therefore, growers will need to adjust their watering practices and be extra vigilant when starting to use PBH as a top-dress. However, these sacrifices might be a small price to pay for control of weeds, moss, algae, and liverwort.



**Figure 5.** A top-dress of rice hulls reduces liverwort and weeds in nursery production. Photo: Heidi Lindberg.

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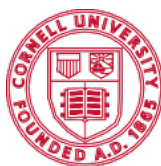
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