New information provides sustainable options for greenhouse operations

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Containers made from plastics are used in most traditional greenhouse operations. While plastic containers are practical, strong, and can be formed to any size, shape, or color, the extensive use of these petroleum-based containers creates significant waste disposal problems for the greenhouse industry and consumers. One example: a 2008 report found that a typical greenhouse operation in California discards over 3560 pounds of plastic trays, flats, and containers annually.

The amount of waste plastic generated by greenhouses has become an important issue as the industry focuses more on creating sustainable practices. Increasing the use of "biocontainers"—containers that are not produced from petroleum and that degrade rapidly when planted in the field or in a composting operation—is one way to reduce the amount of waste plastic generated by greenhouse operations.

In a new study that may provide greenhouse professionals with effective "green" alternatives, researchers report on a series of experiments in which they evaluated the physical properties of a range of commercially available biocontainers and compared them with traditional petroleum-based plastic containers. Scientists Michael R. Evans, Matt Taylor, and Jeff Kuehny compared seven commercially available biocontainers with plastic containers for physical attributes such as strength, water usage, and algal/fungal growth. The results of the study were published in *HortTechnology*.

According to Evans, corresponding author of the report, the results

indicated that rice hull containers had the highest "vertical dry strength" of all containers tested. "Containers composed of 80% cedar fiber and 20% peat, composted dairy manure, and peat had lower vertical dry strengths than the aforementioned containers, but had higher vertical dry strengths than those composed of bioplastic, coconut fiber, and rice straw", Evans said.

"Plastic, OP47 (bioplastic), and rice hull containers had the lowest rates of water loss per unit of container surface area, while peat, Fertil, and rice straw containers had the highest rates of water loss per unit of container surface area", the researchers noted. They recommended that in locations where water use or availability is a major consideration, biocontainers such as OP47 or rice hulls may be preferred to other biocontainers that have a higher water usage requirement.

The researchers also tested "plantable" biocontainer decomposition under field conditions in greenhouses in Louisiana and Pennsylvania. Plants were grown for 5 weeks in Louisiana and 7 weeks in Pennsylvania; results showed that coconut fiber containers had the lowest level of decomposition at 4% and 1.5% in Pennsylvania and Louisiana, respectively.

The authors remarked that results related to container wet strength and water requirements were the most significant findings in their research. "Because the differences in physical properties of biocontainers compared with plastic containers were specific for each type of biocontainer, greenhouse managers will need to decide which of the physical properties are most important and select biocontainers with physical properties that best match their needs."

More information: horttech.ashspublications.org/ … nt/abstract/20/3/549

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