# Biocontainers For Long-Term Crops

Which of the many biocontainers is the most feasible option for long-term crops like poinsettias? Find out.

by **DIANE M. CAMBERATO** and **ROBERTO G. LOPEZ**

THE terms organic, sustainable, alternative and green have become part of our vernacular in a way we could not have imagined a decade ago. Consequently, there has been a proliferation of new products in all sectors fashioned to these ideals. Being the true "green industry" by nature, it is only fitting these products be incorporated – or, more accurately, reincorporated – into greenhouse production and marketing.

Although innovations like recycling are still taking place in the firmly planted roots of plastic containers, there are a number of alternative choices, collectively termed "biocontainers" or "biopots." It is not uncommon to produce or market herbs and vegetables in these containers. Recent studies have focused on trialing biocontainers for use in bedding plant production, typically with a four- to six-week turnover. But growing and selling a long-term crop such as poinsettia or cyclamen in a container that has the tendency to "return to nature" is potentially more challenging.

A 2008 Purdue University survey indicates consumers would not only accept, but would potentially pay more for a poinsettia grown in a biocontainer. This prompted us to conduct a biocontainer trial with poinsettias grown in seven different commercially available biocontainers alongside the traditional plastic. Thus, we were interested to see how these containers would fare for a poinsettia crop, with a production cycle averaging 14 weeks.

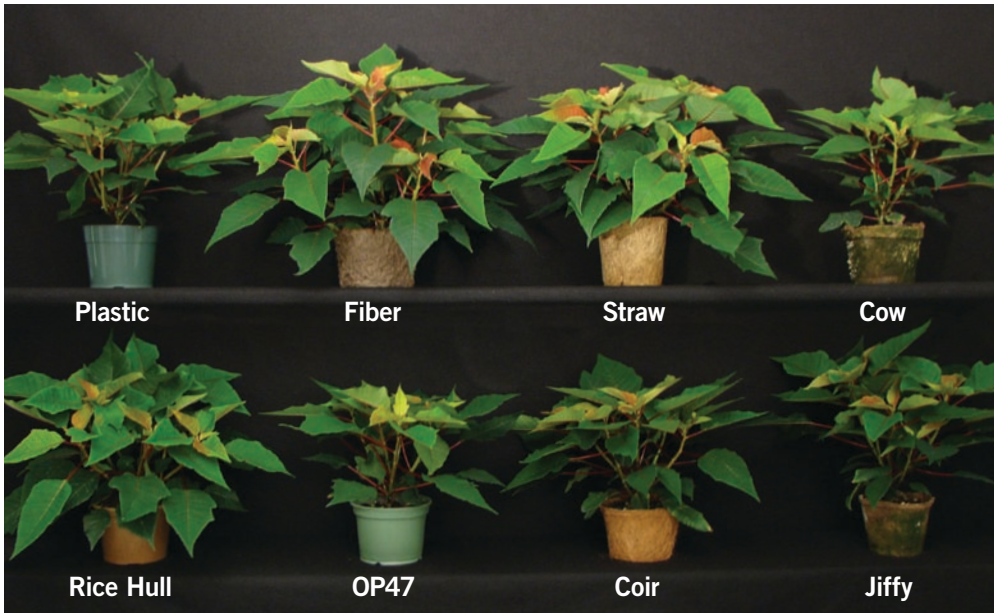


**Figure 1. Finished poinsettias (9 weeks) in all container types.**

## The Study

A crop of Eckespoint 'Classic Red' poinsettia was planted into one of eight container types filled with sphagnum peat and perlite (Fafard Custom 1P). Container types included plastic, rice hull (Circle of Life), straw (The Straw Pot), peat (Jiffypot), coir fiber, cow manure (CowPot), wheat starch (OP47 Bio) and molded fiber (Table 1).

To equalize varying container volume, the same volume of substrate was added to all pots, approximately 1000 mL, with the exception of the peat pot, which held only 750 mL. Typical production protocols were followed. Plants were pinched two weeks after planting, day-night temperatures were 75/67°F, 200 ppm nitrogen was provided at each watering through an automated drip system, and fungicide drench rotations were applied monthly.

In order to assess the visual quality of the eight container types, beginning week 46, weekly visual ratings were conducted until anthesis (first pollen shed). Plastic, rice hull, wheat starch and molded-fiber pots were not appreciably affected by the greenhouse environment. The straw and coir pots trialed similarly in visual ratings and averaged a final rating of 2.9, and although they remained intact, they were highly discolored by surface molds.

The structural integrity of most peat and cow manure pots was compromised after 14 weeks in the greenhouse. These two biocontainers rated similarly, with an average visual rating of 1.5, as many but not all had breakage or the potential to break with any type of handling. Pots were not handled significantly during the experiment, and although all pots remained intact enough to produce a plant, those rated 2 or 3 on our scale would not have been marketable due to appearance. Those rated 1 or 2 were not marketable due to loss of integrity and/or appearance. Figure 1 provides an example as to how containers were rated after nine weeks in the greenhouse.

It is important to note we successfully grew a poinsettia crop in all containers, as plant visual quality (i.e. height, color and bract area) were acceptable. However, both root and shoot biomasses were sig-

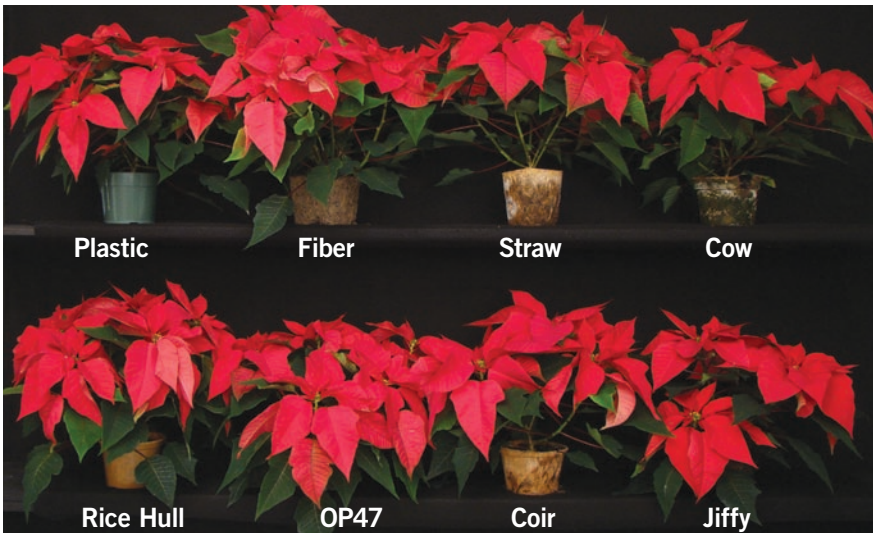


Figure 2. Finished poinsettias (13 weeks) in all container types.

nificantly influenced by container type. Plants with the highest shoot dry mass (stems, leaves and bracts) were produced in the fiber, followed by straw and rice hull, coco fiber and cow manure, then wheat starch and plastic. The highest root dry mass were also produced in molded fiber pots, followed by straw and cow manure, coir and rice hull, then wheat starch and plastic. Plants grown in the peat pots had the lowest shoot and root dry weight, likely due to the reduced substrate volume in the pot size available.

### Are Biocontainers Worth It?

As a grower, you're probably asking yourself, "Is it worth growing a poinsettia crop in biocontainers?" During the 2010 National Poinsettia Cultivar Trials at Purdue, we asked attendees to select their three favorite biocontainers (Figure 2) out of the seven in our poinsettia biocontainer study. Twenty-three, 19, 17 and 14 percent of consumers chose rice hulls, wheat starch, molded-fiber and coir-fiber pots, respectively. Just more than half (53 percent) said they would be willing to pay more for a poinsettia grown in a biocontainer. Of those who were willing to pay more, 39 and 23 percent were willing to pay 50 cents or $1 more.

Inevitable grower concerns to be addressed in future studies would be the effect of irrigation method, mechanization, spacing and temperature on pot degradation, as well as implications of possible container impregnation by fungicides, insecticides and plant growth regulators. Essential to the production of a long-term crop in biocontainers would be the associated packaging and marketing strategy. Plants could conceivably be grown in a biocontainer and inserted into a decorative container for sale, if market demand exists for a sustainably produced product in certain markets.

Inspection of the biocontainers by a diagnostic lab indicated the same molds were present on all pots. Candida was positively identified, in addition to others not identified definitively due to lack of fruiting bodies. Molded fiber, straw, cow manure, coir fiber and peat pots have the advantage over rice hull and wheat starch pots of having a "natural appearance," and although they can be suitable from a plant growth and development standpoint over a 13-week cropping time, there would be major challenges to large scale production and marketing. **GG**

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For detailed descriptions of the biocontainers and an explanation of the rating scale used visit **www.GreenhouseGrower.com.**

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