What is the most profitable liner size?

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Should you purchase rooted cuttings in small, medium, or large liners to grow on in finished containers? Our research to address this question is based on calibrachoa liners produced by eight commercial growers and a research greenhouse in CO, MI, NH, and NJ as part of the Young Plant Research Center program.

"Mini" liners (144-count or smaller) are now available with lower shipping cost and space requirement in propagation compared with a standard (84- or 105-count) liner. If your goal is to minimize initial plant material cost, with good post-transplant performance, mini liners can be the answer. If you have a high shipping cost for bought-in liners, or low overhead and/or heating costs during the transplant to finishing phase, this also favors small cell size. A 4-week-old mini liner is likely to finish in a similar time as an 84-count liner of the same age, thereby providing cost savings. If liners are older than 4 weeks old, however, 84-count or larger liners may finish more quickly.

If you aim to shorten the time from transplant of the rooted cutting through to a finished flowering plant, use a large liner (50-count or larger). Large cell volume is less limiting on shoot growth, will root out quickly in the pot, and finish time can be reduced by 2-3 weeks compared with a standard liner. A 50- or 32-count liner is more expensive to ship and propagate (in time, space, and media) than an 84-count liner, but can result in an extra turn of finished plants or the option of opening up a greenhouse later in the season.

High oil costs have heightened interest in fuel savings with larger liners. Is it worth paying more for a large liner than a standard liner? To answer this question we ran an economic analysis. Our model could be manipulated to vary assumptions, but we will present one scenario here and you can adapt this approach to your greenhouse cost structure.

Methodology

Heat use data were obtained for a 30 ft wide x 100 ft long x 12 ft high double-polyethylene greenhouse located in several U.S. locations, with 70°F/65°F day/night, using a USDA greenhouse energy model (http://www.ars.usda.gov/Research/docs.htm?docid=11449).

Labor and overhead costs of $0.26 per square foot of bench space per week, not including heating fuel, were based on a financial survey of N.Y. commercial greenhouses by Cornell University (http://hortmgt.aem.cornell.edu/programs/hortbusiness.htm) updated for inflation.

We further assumed a price for #2 heating oil of $2.43/gal, the average U.S. residential price from Oct. 2005 to Mar. 2006, which may be reasonable for small finished-plant growers.

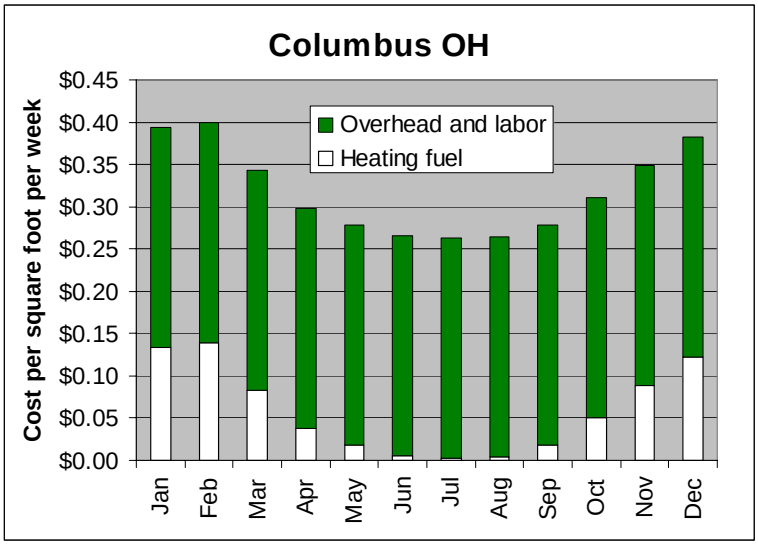

Figure 1. Combined cost of heating fuel, overhead, and labor by square foot of floor space per week

Results

Figure 1 shows, for Columbus Ohio, that the most costly heating months are Dec, Jan, and Feb (white bars). Costs are expressed in square foot weeks (SFW) of floor space.

To scale up to an entire 30 x 100 ft greenhouse, the USDA energy model found that the January heating bill in Ohio would be around $1770. To translate to a few other locations, the January bill would be $720 in Jacksonville FL, $1238 in Greenville SC, and $2225 in Grand Rapids MI. On average across several locations, the month of January consistently is around 1/5 to ¼, February is a little less than 1/5, and March is around 1/8 of the annual heating cost.

Our research found that using large liners could reduce production time of calibrachoa in 4.5-inch pots or 12-inch hanging baskets by 2-3 weeks compared with standard-sized liners.

If an Ohio grower was able to open a greenhouse 2 weeks later by using a large liner in either Jan, Feb, or Mar, the fuel saving per greenhouse would be around $800, $750, or $500 respectively. Therefore, moving the planting date later into the spring, after the coldest heating months, has a great benefit in fuel saving.

However, it is also important to remember that fuel is only a portion of the production cost. For example, research by Dr. Uva at Cornell University found that heating, electricity, and gas in NY greenhouses during 2005 would account for around 10.5%, 2.4% and 0.8% of sales, respectively. In comparison, labor and other overhead costs accounted for 51% of sales. Therefore, later planting would provide labor and overhead savings, beyond just heating fuel (Figure 1, green bars).

Shorter production time is somewhat offset by the higher price of a large or pre-finished liner. Can fuel or other cost savings offset (and justify) a higher price for a large liner? The bottom line: if the the savings in SFW costs to finish a large liner exceed the extra purchase price of that large liner, it is more profitable than a small liner.

Let's take the case where a large liner costs $0.20 more than a small liner. The SFW savings per finished pot would need to be more than $0.20 for a 4.5-in pot (1 cutting/pot) or $1.00 for a 12-in basket (5 cuttings/pot). If a 4.5-inch pot is spaced at 9 x 9-in (0.63 sq.ft.), and a 12-in basket is spaced at 24 x 24-in (4 sq.ft.), a 2 week saving in crop time equals 1.26 SFW or 8 SFW. The labor, overhead and fuel cost per SFW (from Figure 1) is $0.40 in Jan-Feb. Two weeks shorter crop time is worth $0.50 for the 4.5-in pot or $3.20 for the 12-in basket (1.26 or 8 x $0.40). In both cases, it is easy to justify using a large liner.

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