

GROWERTALKS

Features

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The Plug Numbers Game

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Using plugs in your operation can help save you both time and money. Growing plugs not only helps to maximize your growing space, but builds a stronger plant. According to a report by James L. Gibson, professor at North Carolina State University, the advantages of growing seeds in plugs are numerous, including uniform size, lower labor costs, faster growing times and less root shock. These qualities remain true whether you're using a large plug size like a 128 or have chosen a smaller cell size like the 512. So what should a grower consider when determining which plug size to use?

Propagation space

Limited space is one of the main reasons that a grower may choose a smaller plug size. "Smaller plugs and liners allow the grower to fit more plants in their limited propagation space when compared to larger plugs or liners," said Lars Jensen, National Sales Manager for Blackmore. With some trays having as many as 800 cells, a grower can concentrate on several different varieties in a small space.

"If you don't have a big space to germinate things or root things well, you tend to do it in smaller units, so you can get more in that space," said Eric Nelson of Family Tree Nursery in Kansas City, Kansas. Another advantage, shared Bill Argo of Blackmore, was that the roots in small plugs and liners fill the cell faster, allowing them to be transplanted sooner. This allows the grower to turn around their propagation space more often. However, space shouldn't be the only consideration when selecting your plug size.

Know your species

"Before choosing your plug size, you need to know the growth pattern of your plant," said Sam Gallo of Bradford Greenhouses Garden Gallery in Bradford, Ontario. "Each plant has its own unique needs, so it's important that you choose the size that will work best for the plant."

In general, annuals used for bedding flats are planted in a smaller-sized cell from 288 to 512 trays. While a grower may choose a larger cell size to plant his annuals that are meant for hanging baskets, going as low as a 72-plug size.

One factor that Hampshire Farms, which is located in Northern Illinois, considers when determining plug size is the propagation pattern of the plant. As Hampshire Farms focuses mainly on perennial species, some like echinacea would be extremely difficult to propagate in a 288-cell plug.

“Growing echinacea in a larger plug size like 72 or 100 count is beneficial and the size of the plants require less PGRs to maintain its size,” said Hampshire Farms’ Jason Fatten.

The type of root system the plant has is one of the more important items to consider when determining which cell size to use. One of the key benefits of plugs is helping a plant establish a strong root system, but this is only effective if you choose the right cell for the species.

“If I had a slow-rooting or weaker-rooting crop, I would want that in a smaller plug,” said Jason. “So I would have a smaller area—smaller volume—for that root system to develop. If that plant was in a larger cell, it would take a longer period of time to grow that plug and have more time to become lost within that pot.”

Growing a plant as a plug helps to strengthen its root system while encouraging faster plant development when transplanted into the final container.

Consider when the plant needs to be retail ready

Research conducted at both the University of Kentucky and University of Florida found plug size does have a slight impact on the growth pattern of the plants. Both research studies discovered that although there’s little difference in final yields, plants grown in a larger cell size would take longer to reach the same size. An impatiens crop grown in a 588 may take anywhere from 34 to 43 days to reach full size, while the same crop grown in a 288-cell can take about two weeks longer to reach that same size. The general rule is that for each decrease in cell size, the crop will take approximately one more week to grow to its cell capacity.

Choosing a larger cell size is extremely beneficial for growers, like Family Tree Nurseries, who want to extend the period of time that a plant is in a plug tray.

“We like to be able to grow it in the plug tray a little bit longer,” said Eric. “We have lights in only part of our greenhouse, so we try to keep them in a plug tray as long as possible.”

Most of the plugs at Family Tree Nurseries are grown in cold frames. The advantage of choosing a larger plug, said Eric, is that if the weather turns cold, the grower can easily extend the length of time the plant is in the plug. Both the size of the pot and the seasonality are two factors that Jason considers when choosing a plug size. For example in a Mother’s Day crop, he may choose to put a 30-cell plug into a pot and have it buyer-ready in three to four weeks. The larger plug size can help increase the speed of production, particularly in the spring when you may have to turn that crop over much faster.

“Smaller plugs and liners require a longer time to finish when compared to larger plugs or liners, reducing the number of finished turns in the greenhouse,” said Lars. He emphasized that if the grower wants to turn their finished space multiple times in the spring, than they might want to consider larger plugs or liners.

Lower labor outputs

Using plugs offers Jason the option to use limited greenhouse space where he can turn multiple crops over in less time. However, an additional benefit to using plugs is the overall increase in productivity both in maximizing greenhouse space and in maintaining the plugs.

“Fertilizing using plugs versus in a pot is a little bit more beneficial because you can fertilize more plants in a plug tray than you can in a 1-gal. pot in that same amount of space,” said Jason.

Lars said that when comparing trays of the same size, the smaller will dry out faster. The advantage to this is that the grower is able to use water management for height control. While in deeper-celled trays, the soil medium will contain the water for a longer period, allowing it to go longer between irrigations. Bill agreed, saying that plants grown in shallower trays give the grower more control over plant growth. But the grower will need both the facilities and the people to apply water at the proper time.

When using a larger plug size, the plant has the additional space to grow, making it easier to keep the plants moist and retain their nutrients. For most of their production, Hampshire Farms starts using a 100-cell (128 being the smallest) for the perennials to as large as a 30-plug size.

Since Hampshire Farms tends to grow in larger-sized containers (1 gal. or bigger), they prefer to start out with a larger plug. Jason said that one of the benefits of a larger plug is that it can ease the transition into the greenhouse, as smaller plugs take a little more care early on in the production.

“We grow in larger size containers—1 gal. and larger—so putting a small plug into a large pot doesn’t always work out well in the greenhouse after transplant,” said Jason.

Each cell size has its own unique advantages. Smaller cell sizes offer several benefits, including helping to strengthen a weaker root system, while maximizing space in your greenhouse area. The larger cell size allows the plug to remain in the tray a bit longer before transplanting, allowing the plant to retain both moisture level and nutrients longer. Before choosing that final cell size, consider your production schedule, the species-growing pattern—including root development—and the available propagation space. **GT**

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