Air Root Pruning Daylilies, A Work in Progress

by Mark Hamel

The daylilies used in this article were grown for ninety days using RootMaker®, one-gallon plastic air root pruning containers. The bare-root fans were potted on March 12th, 2022.

Air root pruning, simply put, is using air to dehydrate root tips in container plants. You can see in the first picture this is accomplished when the roots are directed through channels in the container to a series of holes. When the roots exit the container, they are

1-gallon RootMaker pot

dehydrated in the absence of humidity and die. The plant responds by replacing this one dead root with up to ten roots off the original root. This is called root branching. The process continues over and over, every time a root exits the container. A fibrous non-circling root system is quickly developed and because of the channels in the container, roots are prohibited from circling in the bottom, a common problem with standard nursery pots. A root system is developed that is less prone to transplant shock and encourages rapid growth after planting into the landscape.

In the second picture, you can see two daylilies that were grown from bare root for thirty-eight days, then removed from the pots for pictures. The one on the left, *H.* **'Perplexing Plum'**, (Pierce-G., 2019), was potted in a one-gallon RootMaker pot. The one on the right, *H.* **'Positive Energy'**, (Pierce-G., 2019), was potted in a standard one-gallon nursery container. The difference in the root system is clear. Though **'Perplexing Plum'** was placed back in the pot for the next set of pictures on day fifty-eight, **'Positive Energy'** fell apart on the table and had to be planted that day in the garden. It is worth repeating, that these were in the pot from bare-root for thirty-eight days. Both plants produced a scape during this time but only one produced a fibrous root system.

'Perplexing Plum' (L) grown in a RootMaker pot and **'Positive Energy'** (R) grown in a standard 1-gallon nursery pot after 38 days from bare-root.

In the third and fourth pictures, **"Perplexing Plum'** and **'Pharaoh's Arrows'**, (Pierce-G., 2017) (I grew multiples) were removed from the pots for pictures on day fifty-eight from bare root. The number of roots on **'Perplexing Plum'** has increased considerably in just twenty additional days.

'Perplexing Plum' after 58 days

'Pharaoh's Arrows' was not moved on day thirty-eight, but it clearly produced fewer roots than **'Perplexing Plum'** in the same amount of time. Perhaps it grows at a slower rate? I do not have an answer for that. As you can see, both have produced a scape that I suspect is a little shorter than it would be in the landscape but, a full-size flower on each one.

'Pharaoh's Arrows' after 58 days from bare-root

The next picture shows **'Perplexing Plum'** blooming again on a second scape at day ninety. Both daylilies were removed from the pot on day ninety, but there was no visible difference in the root systems compared to day fifty-eight. Root development appeared to cease once the plants began the bloom cycle.

'Perplexing Plum', day 90 with 2nd blooming scape

I called this a work in progress. Though I have been using this system for over ten years growing oak trees, and just over three years growing iris, this was my first experience with daylilies. I saw just about what I expected. I was somewhat surprised at the difference between **'Perplexing Plum'** and **'Pharaoh's Arrows'** at day fifty-eight and that root growth had ceased somewhere between then and day ninety, but the pots did what they were designed to do.

In the future, I will definitely use the same one-gallon pots for the first forty-five days or so but I would shift them into a fabric root trapper bag at that point if not planting them right away. In a RootTrapper® bag, the roots are pruned and multiplied in a different way, but daylilies, which require more water than iris, would benefit from the fabric, white-sided container. I plan to take the remaining twelve one-gallon daylilies and shift them into three-gallon RootTrapper bags for the rest of this season and over winter. I want to see the effect on dormant daylilies over winter in the RootTrapper bags as seen in the final picture. Lord willing, I will be back next spring with the results.

You can read more about the RootMaker process, see photos of the other containers and watch a video by going to rootmaker.com or visit drcarlwhitcomb.com for more information.

Root pruning is not new technology. Dr. Carl Whitcomb, of Stillwater, OK, began researching the idea in 1965 and holds many patents for his RootMaker containers, the original air-root-pruning system. I recently asked Dr. Whitcomb if he would be willing to give me a brief summary of when and how he began the process of creating a better root system in container plants for this article. The following was his response:

"In 1965, I came up with a novel way to study how tree roots and grasses interact in the landscape. For this study, I needed 8 trees each of three species. And, to work in the study each bare-root tree seedling had to have four roots of similar length and diameter. I was a grad student at Iowa State and had provided some assistance to Lakes Nursery in SW Iowa. They were willing to allow me to search through huge numbers of trees harvested bare-root, 6 to 8 feet tall, and were in cold storage. I spent many hours digging through dormant trees looking for ones that would fit my experimental design. I was amazed at the terrible root systems and the fact that something as simple as finding 8 trees having four roots of similar length and size was so difficult. And this was true of the pin oaks, honey locust, and silver maple. All of the seedlings had been undercut at least once in the field, but that was of little assistance in improving root systems. That began the search for ways to improve root systems of trees."