

## Special Techniques at Gulley Greenhouse for Anemone and Tissue Culture®

**Heather B. Winokur**

6029 South Shields Street, Fort Collins, Colorado 80526 U.S.A

Email: HeatherW@gulleygreenhouse.com

### INTRODUCTION

The perennial propagation business has grown tremendously during the last decade and new taxa are being introduced all the time. Because we operate in a competitive market, greenhouse growers are constantly striving to find that special niche that will give them an edge. The number of taxa of perennials, and the techniques to propagate them, are critical areas to sustaining a profit margin in this business. With ever increasing labor and material costs we must be constantly vigilant of ways to minimize costs yet still achieve a high quality product. One critical way to reduce costs is to diminish plant losses. We at Gulley's continuously experiment with different propagation techniques to attain higher output with lower outlay. Two methods we are now using that have proved successful for us are root cutting propagation of Japanese anemone and propagation by tissue culture, particularly for *Echinacea* and *Geranium*.

### JAPANESE ANEMONE PROPAGATION

Our previous process was to buy and plant bare-root anemones, but we typically lost at least 50% of our plants by the time they should have been ready to sell. I attended a Perennial Plant Association Symposium in 2001 and one of the classes focused on propagation by root cuttings and how this method could be used for Japanese anemones. I thought this process could work for us so I experimented by placing different lengths and diameters of anemone roots from gallon containers in our germination chamber without any media. We found that although plants were sprouting from the roots, there was inconsistency in the size and number of plants. As we started to grow the mother stock, we noticed that the stock plants were producing plantlets along the perimeter of the plant and shooting up the side of the container from the roots. We were able to cut off the new small plants, leaving a piece of the root attached and plant them in a plug tray. Because the plant still had a piece of the root attached, the majority of the plants would become established with minimal loss. After harvest, the roots would generate new plantlets. Because we were creating more plants and of better quality, we could better grade the plants, and produce a more uniform tray. Discussions with some of our customers who were having similar problems with bare root indicated they would prefer to buy rooted liners if we could provide them. We then began to propagate and sell limited quantities of these plants. Our biggest challenge was maintaining sufficient stock to fill the demand. Each time we would produce a tray to build our stock, we would invariably sell it to a customer. We now grow our stock in a 3½-inch pot in order to get faster and more substantial root development. While we have found that propagation is best in the summer and fall when the plants and roots are actively growing, we are able to propagate year round. Every year we divide each stock plant horizontally in half and plant both the top foliage part and the bottom

root part in order to double our stock. This way we have been able to meet the demand, which seems to be growing every year. Last year we sold 26,000 plugs of four different anemone taxa.

### **TISSUE CULTURE PROPAGATION**

With all the breeding being done in the perennial industry, it is imperative to maintain plants that are genetically identical to the mother plant, so they exhibit the desirable traits for which they are being bred. In addition many more plant sports are being discovered and introduced as new selections. Tissue culture plays a very important role in maintaining and reproducing these new plants. Two key benefits of using tissue culture are the rapid multiplication and the greater uniformity of the plants; however, there is also increased cost associated with this process. With the price of tissue culture plants ranging from 35¢ to 65¢ each (not including freight) added to the cost of planting and growing, the profit margin is very small at best and there is little to no room for any plant losses. In the past we planted the tissue culture directly into the size tray we were selling it in (72-cell tray) and the plants often had a difficult time acclimating to the larger size cell. As a result, we were having substantial losses, were using valuable bench space for growing empty plugs, and were expending significant labor to patch the trays before they were shipped to the customer. While our upfront costs were less, we were spending more on growing and shipping. We now plant the tissue cultures in a much smaller 216-cell tray, so the plants can more easily acclimate to the change in environment. The rooted plants are then transplanted into a larger tray that will go directly to the customer. Because these plants are more mature and healthier when transplanted, the trays remain full and there is little labor spent cleaning the trays before they ship to the customer. There is extra labor on the front end, but the finished trays are much more uniform and of higher quality and there are cost savings due to significantly less plant loss. We are better able to keep up with the marketplace demand for new and exciting plant varieties by using this technique. This past season we sold 100,000 plugs that were started by tissue culture.

### **CONCLUSION**

In such a competitive market and as prices continue to increase for labor and cost of goods, greenhouse businesses strive to produce a high quality product and minimize any losses throughout the growing cycle. We are continually facing new challenges as new taxa are brought into the perennial world, but as technology improves and new ideas are shared with one another, we strive to become more efficient propagators.