

## RESOURCES

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## Commercial Propagation of Hardy Geraniums: Techniques and Recommendations for Successful Production

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### INTRODUCTION

My first introduction to hardy geraniums was as a child. In rich woodlands, meadows, and along roadsides in New England, the wild geranium or *Geranium maculatum* is abundant and a great treat for a small child to come across. It was not until my college years, many bouquets later, did I actually realize what a geranium was. The hardy geraniums, most commonly know as crane's bill geraniums, I will talk about today are members of the Geraniaceae family. I want to stress these are not the common tropical *Pelargonium* species, more commonly called geraniums, and that are frequently referred to in most literature as geraniums.

Hardy geraniums range in size from 4-inch specimens of *G. dalmaticum* to *G. psilostemon* that can reach 48 inches. The name, crane's bill, comes from the look of the enlarged seed pods, before they coil away from each other and disperse their seed. At White Flower Farm, I have seen an increased interest in geraniums, by our customers, in the past 5 years that I have been employed there. Much of this is a result of a fairly new horticultural team that has been stressing the merits of geraniums and initiating the trialing of them at White Flower Farm. This alone is not the sole reason for the increased number and changes in species being added to our mailorder catalog. If it wasn't for the interest of our customers, our nursery would not profit from adding new geranium taxa. The interest of gardeners, both experienced and novice, are contributing to the growth in hardy geranium sales. Most geraniums are easy to grow, and provide extended enjoyment for novices looking to try their hand at gardening. For the more advance gardener, the vast quantity of species and cultivars adds new opportunities to add to their collections.

My discussion will concentrate on the commercial propagation of "hardy" geraniums using examples from species I work with at White flower Farm. The majority of geranium taxa, for the commercial market, are produced by the division of "mother plants" with the few exceptions that are produced by basal and tip cuttings. Seed propagation in most circumstances is unreliable as far as germination rates and many do not come true to type. An alternate method of root cuttings is appropriate for select taxa, although yields tend to be lower, and the length of stay in propagation areas tends to increase.

## STOCK PRODUCTION

Healthy and vigorous stock, produced on a timely cycle, is the first step in the successful production of geraniums. I have found that growing geranium stock in small beds or growing frame situations, where more precise weed control methods and good fertilization coverage can be obtained, is most appropriate for geraniums. Large field areas that utilize mechanical planting and cultivation can result in damaged stock as a result of injury to the new growth by this mechanized equipment. Without timely weed suppression or removal, the competition for water and appropriate light conditions can reduce the yields from the mother plants the following fall. At White flower Farm (Zone 5) we plant our geranium stock, for root cutting and division items, in mid May when the most threat of serious frost has passed. I find our stock benefits from the cool weather of May to enable firm root establishment. We find a team of three workers can prep and plant approximately 1800 geraniums during an 8-h workday. These plants are watered thoroughly by hand to set them into the soil. It is important to continue to water these areas daily, thoroughly soaking the root ball and the surrounding soil equally, to aid in the rooting potential of these plants. Drip irrigation supplied directly to the center of each bed, running for approximately 6 to 7 h a day for the first week, provides ample coverage for the newly planted stock. These planted beds have previously been fertilized with a 5N-10P-10K granular formulation and lime is applied at rates determined after early spring soil analyses are performed. By mid June all stock areas are thoroughly mulched with a shredded mixture of bark mulch. Careful application is required to avoid over mulching around the crowns of the plants. Mulching too thickly could result in excess moisture around the plant crowns. As a result disease problems could occur. Once this mulch has been applied it reduces the need for frequent weeding, and it reduces evaporation loss resulting in the need for less frequent irrigation. At this point little care of these plants is needed, until late June or July when another application of fertilizer is applied. Overhead irrigation is required for this process unless an extended period of wet weather has set in. An additional application of fertilizer is beneficial in early September, at which time another treatment of lime is usually necessary because of the reduced pH due to the decomposition of the bark mulch. We tend to see much of the growth occurring after September 1, when our hot dry days of summer have usually ceased. Geranium stock is harvested during the last week of October, at which time it is immediately worked. This stock can only be stored in refrigerated areas for a couple of days, unless they are cleaned and stored in single layers on dry packing material, to avoid decay to the growing tips.

## PROPAGATION TECHNIQUES

**Division Propagation.** Once the geranium stock has been harvested, our propagation staff immediately sets about working these plants. This plant cleaning includes removing all loose soil by gently shaking each individual plant. Foliage is removed usually halfway to its crown, and roots are shortened to 2 inches. Cutting this older foliage aids in successful transplanting due to reduced transpiration. Stock grown on this 1-year cycle will yield varying division pieces depending on the geranium taxa we are working. *Geranium* 'Phillippe Vapelle' is a vigorous grower and will average seven divisions per plant. This species offers a large and somewhat



straight root mass, aiding in the quickness of the division process. This species is very easily divided into single shoots that are suitable for a 3- to 4-inch pot, which is the typical pot size for White Flower Farms mailorder pots. *Geranium sanguineum* has been a very popular species for us. Recently, White Flower Farm has begun to offer *G. sanguineum* 'Alpenglow' which has been widely accepted by our customers. This cultivar is representative of the sprawling open-foliage geraniums we produce. I find the yield is satisfactory after 1 year (4.8 divisions per plant), but if time permits, 2 years in our stock beds will almost double the yield (8 divisions per plant). This is possible provided the cost of stock garden maintenance can be kept at a minimum to avoid increasing the cost of producing the plant. *Geranium sanguineum* var. *striatum* tends to be a much slower growing plant. Yields after 1 year are only 2.8 divisions per plant. Two years in the stock bed is recommended for this variety, at which time a yield of approximately five division per plant can be expected. These single divisions are potted into a well drained soilless potting mixture and placed on propexed floors in minimally heated greenhouses to grow on. Average winter nighttime temperatures hold 50F. Watering is kept at a minimum to avoid root and crown rot diseases. We begin shipping in late February to our southern customers. By this time these geraniums have successfully rooted into their pots. Portions of these plants are kept as stock to restart the cycles.

**Root Cuttings.** I have had minimal experience with root cuttings of geraniums, but I would like to mention a few points. I have found that root pieces of *G. sanguineum* species, can yield a portion of your crop, if a longer propagation time is allowed. This can generally reduce the quantity of stock planted and save labor and space in the stock growing areas. After the division pieces have been prepared, one is left with a pile of discarded root pieces. If these roots are cut into 2-inch segments and placed horizontally into deep plastic flats about 2.5 inches below soil; ample plants can be produced. After watering these flats in well, we place them in a fog house at about 80% humidity and 70F with bottom heat provided. These flats are watered very infrequently during the short winter months. This process takes approximately 2 months to start to see growth above the soil level. At this time they are removed from the fog house and placed in a cool greenhouse holding around 50F nighttime temperature. In another 3 months these will be rooted adequately enough to be potted into larger pots for later sales. In our situation at White Flower Farm, these plants, maturing at a later time, are not adequate for our mailorder sales. I will utilize these for stock to restart our crop cycles.

**Tip Cuttings.** Recently we have begun to offer geraniums that benefit from the tip cutting or basal cutting method of propagation. Stock for these species are planted in mid to late May, either in open beds or into growing frames. This stock is used for 3 years, at which time it will be renewed with fresh stock. This stock is grown very similarly to our division stock, with fertilizer and lime applications being applied after early spring soil testing has been done. Cuttings are taken, beginning, in early August after flowering has ceased.

*Geranium macrorrhizum* 'Ingwersen Variety' is a very versatile geranium. Grown in shade or partial sun, it enjoys a well drained location. This geranium produces long stems emerging from a very woody root mass. These elongated stems make this plant, aesthetically, not suitable for divisions. Basal cuttings are taken with a very sharp knife, being certain to take approximately 1 inch of the dark brown stem,

below the foliage. Foliage is trimmed, leaving only two of the shortest new leaves. We place these cuttings into large cellpacks under mist until rooting starts. When the first roots appear the flats are moved to dry benches in a greenhouse with nighttime temperature of 65F to finish rooting on. These cell packs are fertilized weekly at 100 ppm of 13N-2P-13K liquid fertilizer. Approximately 6 weeks after cutting, these plugs will be ready to go into their 3.5-inch pot. These are placed on the floor in a cool greenhouse for the winter months and will be ready for late February potting.

### **CONCLUSION**

To conclude, I feel hardy geranium species are worthy of our time and effort. The first step in the commercial production of geraniums is to have a customer base to whom you can sell these plants. Secondly, you must have ample stock to supply this customer base, to avoid turning customers away. Thirdly, you should have a knowledgeable production staff to see that each step in the geranium cycle is followed with success. Given adequate soil and environmental conditions, and if appropriate planting and propagation techniques are followed, your customers will be rewarded with healthy, beautiful specimens to add to their gardens and ample stock will be recycled to produce the next years crop.