

are dioecious, so plants will carry either male or female flowers. Martin Grantham assures me that if six plants are in the ground, statistically there should be at least one member of each sex present. Restios are wind pollinated, so they need to be near each other, with the “boys” hopefully upwind of the “girls”. And when the seeds actually ripen, they are released over a very long period with a small quantity released at one time. So, patience will be an element here. This year there was a small harvest of some species and they will be planted this fall to test viability. There are always new plants to try.

Salvia Propagation®

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In 1989, I started as a garden assistant growing cut flowers for the farmers market. In my search for new and different material for bouquets, my fellow propagator, Christine Dye, and I came across *Salvia gesneriiflora* ‘Tequila’ on a field trip to the Huntington Botanic Gardens in Los Angeles, California. At that moment my passion for salvias began. In 1989 we grew only three sages for our sale – *S. elegans*, *S. leucantha*, and *S. microphylla*. At Cabrillo College we propagate and grow salvias from all over the world for our annual Mothers Day plant sale. This year we offered a selection of 173 species and cultivars.

PROPAGATION

Our propagation methods are influenced by many factors including origin of plant, time of year, quantity of cutting material, seed production, growth type, and health and age of mother stock. Often more than one type of method is used. Almost all of our asexual reproductions of salvias are by stem cuttings and a few by division. From an economic point of view, most cuttings produce a larger plant faster than from seed and will bloom the first year. All cultivars and hybrids should only be reproduced by cloning.

Cuttings. We use nonflowering stems on healthy fertilized mother stock in ground or in nursery cans. Stem tips and laterals are most commonly used and on some of the larger hollow-stemmed plants I cut the new shoots sprouting from the base. *Salvia apiana* is an example. They are sterilized in a diluted bleach solution and treated with a liquid rooting hormone. I use Dip ‘n Grow at a dilution of 1 : 10.

The cuttings are stuck in sterile containers in a medium consisting of 3 perlite : 1 sifted peat (v/v) and put on a mist bench at 5-min intervals. The bottom heat is set at 70 °F. The cuttings are fertilized weekly with 20-20-20 at 100 ppm. Most salvias are rooted in 4 weeks with the more vigorous rooting as early as 2 week and slower rooting in 6–8 weeks. They are then potted up with soil mix in sterile containers and put back under the mist bench, misting at longer intervals of 30 min for 1 week so they acclimate slowly. This has increased the rooting percentage greatly.

Division. Some of our fall-blooming salvias spread by underground runners, and produce large colonies in the ground; division easily propagates these. The stock is divided from cans or dug up from the ground and grown in an outside shade structure. This ensures a large saleable plant for the sale. *Salvia arizonica* and *S. madrensis* are examples.

Seeding. More than half of the crop is propagated by seed, which we grow and collect on site. This results in the use of higher quality seed. Seed must be fresh to insure a higher rate of germination. Seed is properly stored between 40–50 °F. Growing plants from seed, while at first it seems more labor intensive, will in the long run, produce a stronger plant because of genetic diversity and create a larger gene pool. Examples, *S.* ‘Cabrillo Sunset’ and *S.* ‘Cabrillo Sunrise’ are *S. darcyi* hybrids, which were selected out of a seedling tray and the garden hybrids ‘Jean’s Purple Passion’ and ‘Jean’s Gem’ hybrid crosses of *S. gesneriiflora* ‘Tequila’.

Some salvias that are propagated from seed are dictated by their growth habit. Basal rosettes, for example, *S. daghestanica* (syn. *S. canescens* var. *daghestanica*) and *S. indica*, produce little or no cutting material since all leaves are connected to the base. They can be divided after 2 years and will only produce 2–3 plants, but from seed will produce enough plants to be economically viable.

Seed germination requirements are determined by origin of the plant, habitat, and bloom time. This has been the key to success in propagating a single genus that is found almost worldwide.

In breaking dormancy we use a variety of techniques for different species based on this information.

We manipulate seeds with darkness, light, cold heat, and gibberellic acid. For dark treatments seeds are sown covered with sterile medium. In light treatments seeds are sown on top of the soil. This is directly related to habitat and seed size.

For cold treatments the seed is stratified adding the seed with moistened vermiculite and put in the refrigerator at 40 °F for 1–3 months. They’re then sown and put on bottom heat.

Knowing your seed’s origin will determine if it needs to be stratified in order to germinate.

Gibberellic acid helps seeds convert starch into sugars. The seeds are soaked in GA₃ at 500 ppm for 24 h and then sown into a sterile medium in sterile containers. This method was developed by Stephen Bertrand and described in a GA₃ information pamphlet by J.L Hudson, Seedsman (Pers. Commun.)

Some etiolation can occur with the seedling; most of the time this causes no injury to the plant. I just bury the stem up to the true leaves when I transplant from seed tray to liner.

With basal rosettes this actually gives the seedling air circulation between the leaves and the soil. So the seedling has less chance of rotting.

CONCLUSION

While GA₃ will improve your germination, all factors should be considered including origin of the parent plant, does the seed need to be stratified, covered or uncovered, and what time of year to sow to maximize germination rates.

LITERATURE CITED

Hudson, J.L. 1997. Gibberellic acid-3 information. Seedsman, Star Route 2, Box 337, La Honda, California 94020.