

HYBRIDIZING AFRICAN VIOLETS

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I. Choose the two parent plants you want to cross.

The choice can be made based simply on your two favorite plants and a desire to find out what kind of offspring they will produce or you may have a goal of producing a specific flower color or shape. For example you may want to create a large red and white bi-color single star shaped flower. In the latter case some basic knowledge of violet genetics would be helpful. See Appendix I.

II. Perform the cross pollination

The pollen donor flower should be mature--slightly beginning to fade in color. Remove the pollen sack (anther) from the flower with your finger. Using a selecto hobby knife (razor edge) cut about one fourth of the pollen sack open to expose the pollen. The flower from the other plant from which the seed pod will form should be a relatively younger flower that has been open for about 2-4 days. The stigma is the tip of the single narrow tube called the style in the center of the flower that usually points away from the pollen sacks. The stigma upon which the pollen will be placed will be sticky at this time which enables the pollen to stick to it. Carefully apply the opened surface of the pollen sack from the donor flower (male component) to the tip of the stigma of the receiver flower (female component) so that the pollen adheres to it. It is recommended that this procedure be repeated for several flowers on one plant to enhance the chances of a successful cross.

Loosely tie a thread to the stems of the flowers that were crossed to ensure they are left on the plant for the pods to mature as other flowers fade and are removed. It will take about 3-4 weeks to determine if the cross "took" and that a seed pod is developing. A developing seed pod can be observed as a swelling at the base of the flower after the petals have faded and dried up. The seed pod should be left on the violet until it has turned brown and is completely dry as well as the stem that supports it.

It will require about 3-5 months from date of the cross pollination to the time that the seed pod is mature and can be removed from the plant. The seed inside the pod will be viable for several months so it is best to err on the side of caution before removing the pod from the plant. Once the seed pod has dried it can be stored in a zip lock bag for planting of seed during the next several weeks.

For those who are interested in growing violets from seed but don't want to wait for the pods to develop, African violet seed can be purchased from Ronn Nadeau's website: <http://nadeausafricanvioletseeds.com/> The site provides very useful information about growing from seed and he is good about responding to questions via e-mail.

III. Planting the Seed

The following supplies are needed before planting the seed: (1) a good quality seed starter mix. It must be sterile, moisture retentive and very fine particle size because violet seed are so small. I recommend the mix sold on Ronn Nadeau's website. It is inexpensive and you don't need much for starting seeds.

(2) a container with drainage holes for the planting mix which can be covered with a transparent material such as plastic wrap on top to create humidity for seed germination. I recommend a clear plastic container with lid that is used to package salad greens at the supermarket. Burn about 9 evenly spaced holes in the bottom for drainage and holes in the lid to allow some air to circulate. Fill the container about $\frac{3}{4}$ full with the potting mix. Add enough water to dampen the mix and allow excess to drain out of the bottom. Place the seed pod on a sheet of notebook paper which has been folded to form a crease. Using the selecto knife carefully cut the seed pod open and let the seed fall into the crease of the notebook paper. See photos of the seed pod and individual seed in Appendix II. Using the tip of a pencil carefully distribute the seed from the paper onto the surface of the potting mix ideally about $\frac{1}{8}$ inch apart. Make sure that any excess water has drained out. Place the lid on top of the container and put in window or one foot under a fluorescent light. Fluorescent light is preferred because the heat promotes germination. Fluorescent light stands are relatively expensive but have great advantages over natural light for growing violets. I recommend Indoor Garden Supply which has a wide variety of plant stands. Every few days open the lid to make sure that the seed bed is moist—don't assume that it is moist just because moisture is present on the inside top of the lid. Use the baster to add water to saturate the seed bed if necessary. Remain patient during the germination process. The first seed should begin sprouting in about 3 weeks and will continue sprouting for an additional 3 months. See photo of germinating seedlings in Appendix II. About one month after germination begins, remove the lid but be extra careful about checking to ensure that the seed bed is moist. About 2 weeks after sprouting you can begin feeding the babies with $\frac{1}{2}$ the recommended strength concentration of liquid fertilizer. I recommend Optimara Violet Food 14-12-14 Bulk - 1 LB. Tub. It can be purchased from Selective Gardener <http://www.selectivegardener.com/Plant-Care->

[Products-c2/](#). Using the baster apply the fertilizer in drops around each plant being careful not to drop directly on the leaves. I use the edge of a paper towel to absorb the solution if it falls directly on the plant. About 3 months after the first baby has sprouted they should be big enough for their own pots.

IV. Transferring Plants to Individual Pots.

Before you separate the babies, you will need enough pots and a good quality African violet potting mix. I use 3 inch diameter clear plastic Solo drinking cups which have 3 drainage holes burned in them. I recommend Fafard Professional Potting Mix. Add the potting soil almost to the top of the container. Make a small indentation in the center of the soil and put some of the seed starter mix in the hole for the young plant to begin growing in. To remove the small plants, use a small cocktail fork to pry the plants up. Once the clump of mix has been raised, carefully remove the plant by gently pulling one of the leaves up which will remove the plant, roots and some of the mix attached to the roots. Place the plant in a small hole in the mix in the center of the container and using the baster, add enough water to stabilize the soil around the roots. Then add enough water to saturate the rest of the soil in the pot. Repeat the procedure until all plants have been removed to their individual containers. They are very hardy and most if not all will survive the transplant.

V. Care of Transplants

- Fertilizing--The plants should be fertilized at the recommended rate of $\frac{1}{4}$ teaspoon per gallon every other time you water, except every six weeks use plain water to flush accumulated fertilizer salts down from the top of the soil. Discard the water that drains out. Watering with a weak fertilizer should be done whenever the top of the soil begins to feel a little dry usually about every 4-7 days. If the top is slightly damp you can water from the bottom using a saucer and the needed water should be drawn up within 15 minutes. Just never let the pot sit in a saucer of water longer than 30 minutes to avoid root damage. After watering place the pot on a surface that provides for an air gap for the drainage holes. This could be a plastic plant saucer with ridges to allow air to contact the opening of the drainage holes. I use a 2 foot by 4 foot plastic ceiling tile grid which keeps the drainage holes exposed to air.
- Repotting--When the diameter of the plant reaches almost 3 times that of the container, repot it into a 4.5 inch container. Violets should be repotted every 9-12 months or if you notice that new growth from the center has not occurred for a period of a couple of months. The reason is that over a period of time soil bacteria break down the organic constituents present causing an acidic condition in the soil that prevents proper uptake of nutrients to the plant. The

- other issue is that over time the soil becomes more packed which eliminates the air pockets that provide needed oxygen to the roots causing them to stop growing. If the plant has developed a “neck” between the soil surface and the bottom row of leaves, this can be corrected during the repotting. The procedure requires first removing any damaged, yellow, or very old leaves from the bottom row. This is accomplished by bending the leaf to one side or the other causing the stem to break flush with the main stalk. Using a dull knife carefully scrape the thin brown surface of the neck all the way around. Then remove enough of the bottom layer of soil to enable you to bury the neck in new soil and then water thoroughly from the top. New roots will emerge from the neck that will eventually stabilize the plant and encourage new growth to appear at the crown. When repotting to remove soil that is more than one year old you should remove as much of the old soil as you can crumble away from the roots. Add enough soil to the bottom of the pot to bring the plant up to the desired height in the pot. Then use a spoon to add the rest of the fresh potting mix around the sides of the root ball and up to just below the first row of leaves. It is not necessary to move the plant to a bigger pot unless the diameter of the plant has become 3 times larger than the diameter of the pot it was in. There will be a wide range in plant diameter among the seedlings from a single cross—a couple of mine are actually miniatures (less than 5 inches across).
- Blooming--Plants should start blooming within 6-9 months after germination. Expect many to resemble parents in some ways, but no two will be identical and a few will be spectacular and may look nothing like their parents—check out the pale lavender pink star in Appendix II. If a violet is not blooming but is otherwise healthy looking, it is not getting enough light. Fluorescent lights solve this problem and by using a timer you can vary the length of exposure to get the right amount of time. Fluorescent lights also enable you to better see and enjoy the beauty of your plants.
 - Suckers—These are like little plants growing from between the leaves from the main stalk. They should be removed as soon as identified because they take energy from growth of the main plant and destroy the symmetry. Just make sure you know the difference between a sucker and a new flower bud. Flower buds are usually darker than suckers when they first appear. Suckers can be rubbed off with the rounded point of a pencil. If they get very large with several sets of leaves they can be carefully pulled off the main plant by grasping all of the leaves associated with the sucker in one hand and gently working it back and forth until it breaks off where it was attached to the main plant. You can use a pencil point applied to the base of the sucker to pry it off.

Because the sucker is like a little plant without a root system, you can plant it in moist vermiculite as you would a leaf and it will develop roots.

- Pests and Diseases
 - Thrips--The most common pests I have encountered are thrips. They are small insects which can fly and they can enter through window screens or on clothing if you have been working in the garden with flowers outside. They feed on pollen and damage the appearance of the flowers. I remove all flowers and buds and spray plants with an insecticide containing spinosad such as Conserve.
 - Powdery Mildew—This is a fungus which appears as white patches on the leaves. It is most common when the temperatures are on the cool side in the 60's and there is no air circulation. I have controlled this by increasing the temperature to 70 degrees and putting a fan in the room to provide some air movement without causing a direct draft. Spray with Spectracide Immunox fungicide and completely wet the leaves.
 - Crown Rot—This is a fungus that attacks the center growth of the plant. It most likely occurs if water falls on the crown of the plant and is not removed. There is no cure except starting a new plant from leaf cuttings and discarding the diseased plant.

VI. More Information

The African Violet Society provides members with articles on culture, hybridizing, and supplies in its bimonthly publication. It comes free for dues paying members and the annual dues are very inexpensive. See <http://www.avsa.org/>

APPENDIX I

African Violet Genetics

African violet traits such as leaf shape, flower shape and color, etc. are determined by a pair of genes—one obtained from each of the parent plants. Genes can either be dominant or recessive. If a plant has either two dominant genes or one dominant and one recessive for a given trait then the plant will display that dominant trait. However if a plant has two recessive genes for the trait then the recessive trait will be displayed. Using the table below, it is therefore possible to tell what the offspring will look like. The reason for the two potential outcome scenarios is that when one of the parents exhibits a dominant trait, there is no way to know whether the plant possesses two dominant genes or one dominant and one recessive gene for that trait. The only way to know is to look at the percentage of the offspring exhibiting each of the two traits. It may take two crosses to get the two recessive genes to pair up and produce the desired recessive trait. The Table below lists each of the traits as either dominant or recessive and the result of crossing parents which exhibit each.

DOMINANT	RECESSIVE
<u>Flower Traits:</u>	
Violet Shape	Star Shape
Geneva Edges	Solid Edges
Raspberry Edges	Solid Edges
Fringed Edges	Non-fringed Edges
Fantasy Pattern	Solid Flowers
Double Flowers	Single Flowers
Pale Colors	Dark Colors
Blue Flowers	All other colors
Red Flowers	Pink, White
Non-Coral colors	Coral family colors
Bluing Factor	Non-Bluing
Mottled Flowers	Non-mottled flowers
Thumbprint Flowers	Solid Flowers

Glitter factor	Non-glitter
Wasp	Non wasp blossoms

Leaf Traits:

Girl Foliage	Boy Foliage
Ruffled Foliage	Plain Foliage
Plain Foliage	Spooned Foliage
Longifolia Shape	Rounded Shape
Red Backing	Green Backing
Watermelon Veins	Plain Veins
Clackamus Veins	Plain Veins
Solid Foliage	Lilian Jarrett Foliage (in part)
Bustle back leaves	Non bustle back leaves
Opressed leaf hair	erect leaf hair
Holly foliage	plain foliage

Plant Traits:

Small Size	Normal Size
Non-trailing	Trailing

Maternal Traits: Tommie Lou and Crown Variegation, Lilian Jarrett Variegation (in part).
Offspring will only show the trait if the seed parent had the trait.

The following list is the expected results from genetic crosses with dominant and recessive traits:

1. Dominant X Dominant

Result - all Dominant offspring

or 75% Dominant and 25% Recessive

2. Dominant X Recessive

Result - all Dominant offspring

or 50% Dominant and 50% Recessive

3. Recessive X Recessive

Result - all Recessive offspring

The percentages given for the offspring are approximate values. The actual results you get may vary considerably from these percentages.

The above information was obtained from an article written by DR. JEFF SMITH

Appendix II. Photos

1. Seed Pod



2. Seed



3. Germination (Dime shows relative size)



4. Individual Solo Cups



5. Mother Plant



6. Father Plant



7. Diverse Offspring (a few examples of the 41 babies)







