Potting Mix Alternatives:

In Search of African Violets Like Granny Grew

By Betty Ferguson

We've all seen photographs from the 1950s and '60s of nicely suited ladies and gentlemen proudly displaying prize-winning African violets with diameters of bushel baskets. What has happened that in our modern shows we seldom see huge, healthy plants like Grandma grew?

Deciding the potting mix might hold the key, I began to suspect our recommended 1:1:1 potting mixes (one part each of peat moss, perlite, and vermiculite) might be robbing our plants of some of the beneficial elements of Grandma's mix--even when we add the benefits of a good fertilizer with micronutrients. As you probably recall, those old-fashioned soil recipes usually called for barnyard manure and often contained garden dirt.

Off I went in search of a better mix than my basic 1:1:1 concoction. I found that since Granny's day at the show, soil experts have been busy researching to find the perfect container media. I'm not going to send you out to the barnyard or even to your garden, but I will make suggestions for improvements over your peat-based mix.

Basic Requirements of African Violet Soils

Soil fills only a few needs for our plants, and actual soil (dirt) is not even a requirement. But a good soil mix must have the following four qualities:

1. ***Good water-retention***. The soil needs to be able to retain a sufficient quantity of water to supply moisture to the African violet between each watering. Although it is not necessary for the soil mix itself to provide the nutrients necessary for growth and the health of plants, it must provide a holding place for nutrients from supplied fertilizers.

2. ***Good drainage***. Excess water must be able to drain immediately from the pot. The small particles of peat moss and backyard style compost tend to compact over time. The compacted media then retains water, eliminating oxygen from the soil and smothering the roots of the African violet. The plant fails to thrive and may die as the roots rot because of insufficient air at the root zone. Because of this trait and increasing acidity, African violet growers are encouraged to repot our plants at very frequent intervals—another reason I went in search for a new mix. I was tired of repotting and washing dirty pots, which clutter my garage or back porch until a nice day and the right mood convene. Another problem with peat is its inclination toward hydrophobia, the tendency for a material to repel water when it dries down to under about 30% water content. Dry spots form within the violet's root ball making it very difficult to re-wet. Soils lacking good drainage are also susceptible to a build up of salts.

3. ***Good aeration***. A good mix must maintain enough porosity for air to move through the root systems and for by-product gases to escape. Access to oxygen in the root system is necessary for the health of our plants. The particles used in an African violet mix should be of sufficient size to allow tiny air pockets between each particle. Although water contains oxygen molecules, this

oxygen does not satisfy the need of air for the plant. When too much water is in the mix, oxygen is driven away causing smothering. At your next repotting session, notice if the roots dominate the area near the bottom and sides of the pot leaving interior areas essentially rootless. This symptom indicates that the plant was not able to get the oxygen it needed throughout the mix.

4. ***Anchorage***. Soil provides a place for roots to anchor the plant, securing it and preventing it from toppling over.

A good potting soil will have about equal parts of solid particles, water, and air when the soil is saturated. When the mix is dry, nearly 70% of the volume should be air.

Organic and Inorganic Media

Soil mix ingredients are described as either organic or inorganic. Organic components are dead plant materials, such as peat moss, compost, and bark. Inorganic materials include volcanic lava, pumice, perlite, calcined (baked) clays, and diatomaceous earth particles (not the powdered form).

Recommended Ingredients

Since aeration and drainage are linked to soil particle size, it is reasonable to find and use components with particles larger than peat in addition to, or to replace, peat. Within a short time, the small particles of peat pack and clog macro-pores of air-holding components, such as perlite, creating a detrimental water-retentive soil. Many experts are completely eliminating peat from their mixes. Others are decreasing peat to one part (or even less) to five parts of larger sized particles. Some recommendations for substitutions and improvements are discussed below.

Partially composted conifer bark: More and more container gardeners are exchanging sphagnum peat for partially composted pine or other conifer bark fines (particles up to 3/8") in their mixes. Not only is bark an inexpensive, locally available, and readily renewable resource, its use helps prevent the over-harvesting of peat bogs. Bark fines provide just the right size particle for drainage and proper water retention, and the particles remain rigid providing air-holding pockets in the root zone much longer than peat or compost mixes.

Conifer bark contains a preservative called suberin, which slows the decomposition of conifer bark-based soils. While bark will break down eventually, it still holds its structure for a long time and will not impede air circulation or drainage. Instead of repotting every three to six months, a plant should be able to go for at least two years in the same mix. In the interim, repotting becomes necessary only as the plant grows to a new pot size. Pine bark locks moisture into the soil and is a source of the trachidermia fungus, a natural fungicide that prevents harmful fungal growth from occurring. In other words, bark kills bad fungus and increases good fungus.

Partially composted pine and cypress barks are easily obtainable in the South, and large bags can be purchased at nurseries and garden centers for only a few dollars. It may be packaged as pine, cypress or fir bark or mulch, or as organic compost, landscape mix, or soil conditioner. Look for products with small particles no larger than ½". The bark can be sifted through 1/8" to 1/4" screens. (Hint: I plant my tomato plants in a mix of the larger, leftover particles, old potting soil, and manure. The bark retains moisture for the roots when the garden soil begins to dry out.)

Container soil experts recommend that approximately 80% of the bark particles be larger than 1/8" (up to 3/8") and the rest be 1/8" or finer. The larger bark particles (over 1/8") ensure good aeration. The smaller particles ensure we get enough water retention without destroying aeration. Some growers choose to use peat moss for the small particle percentage.

The pH of peat moss usually runs between 3.5-4.5; the pH of pine bark is 3.5-5.0 and sometimes up to 6.0. Since the optimum soil pH requirement for African violets ranges from 5.8 to 6.2, both peat and bark should have dolomite lime added to raise the pH.

***Rice hulls**:* Like bark, rice hulls are an organic component and are slow to break down. They act like tiny water pipes to channel and retain water, and they provide little niches for oxygen. Long used in container soil mixes in Asia, rice hulls are now being used by Western nurserymen as an inexpensive perlite substitute. A couple of weeks after I initially added rice hulls to my potting mix, I found hundreds of little rice plant blades keeping company with my violets. Now, I heat the hulls to sterilize the rice kernels, which are apparently left intact in the hulls. Unlike bark and some of the inorganic products, rice hulls are typically used as an additive (20-30%), not the primary ingredient. Their pH is near neutral to slightly alkaline.

***Vermicompost**:* Unpasteurized worm compost provides soil microbes which assist the plant roots in the uptake of the nutrients we provide and helps protect against disease. Ten to 20% of your mix can be vermicompost.

***Other organic media**:* Researchers are looking into other locally available organic by-products for potting mixes including peanut and pecan hulls.

Akadama: This granular, clay-like mineral is inorganic and looks roughly like red balls or ground brick. Many growers prize Akadama for its porosity, stability, and its ability to store water and mineral nutrients and gradually release these to plant roots. Coming from Japan, it is expensive in the U.S., and other inorganic products make fine substitutes.

Turface MVP: This is the product used for surface dressing of baseball infields and as a soil amendment. It is durable, baked clay about the size of kitty litter particles. To find a dealer, go to the company's website at www.turface.com. Schultz Aquatic soil is the same stuff. Bonsai artists and hydroponics growers are big proponents of Turface.

Diatomaceous Absorbent: A granular form of diatomaceous earth, this product is used to clean up spills and can sometimes be found packaged as cat litter. DE absorbent is highly recommended for potting mixes. It can be bought from Napa Auto stores as Part #8822. It does not pose a significant health risk to pets or humans.

Lava rock: Small pieces, up to ¼", of lava rock provide excellent aeration for roots. It can occasionally be found as "lava sand," but you may have to break larger pieces up with a hammer.

Pumice: Pumice, a very porous and lightweight lava rock, can be purchased as Dry Stall from farm stores.

Perlite: The commonly used potting mix additive is a volcanic glass that, when heated to a certain point, expands from four to twenty times its original volume.

Over the years, as we adopted our peat-based mixes, we began to look at fertilizers as miraculous growth concoctions, expecting them to fulfill all of our plants' needs and grow super plants. However, many do not provide micronutrients; and even the ones that do, generally do not provide calcium or magnesium. Dolomitic lime should be added at the rate of one tablespoon per gallon of soil mix to provide calcium and magnesium and to raise the low pH level of bark and other acidic media. Hardwood ash also neutralizes acid soil and provides calcium and magnesium.

I'm not prescribing a specific soil media recipe because growing conditions vary greatly from West Texas to South Florida. You might begin with a 50:50 organic to inorganic mix, and experiment from that point using a few guinea pig plants. Organic products are not necessary ingredients in potting mixes. I tried a purely inorganic mix, however, but my plants just sat there, not growing. I found organic ingredients necessary to keep my mix from drying out too quickly, and I believe now the inorganic mix was lacking the beneficial microbial action that occurs when organic ingredients are used. You may be able to go in with another grower when you shop since the bags these products come in are usually large. Or you might propose a club experiment.

My experimentation is still in the early phases. I have yet to achieve the huge plant size my mama managed back in the late fifties and sixties, but I've seen an instant boost in growth, health, and bloom color and size.