



# SOIL: An Introduction

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The term soil is used for any growing medium which anchors a plant and permits it to grow in a pot. It is variously and interchangeably described as soil mix, potting soil, growing medium or potting mixture. It is not *soil or earth* in the agricultural sense because it lacks the standard mixture of sand, silt and clay. As a result, it is a synthetic or *soil less* mixture. Almost all soils or potting mixtures for gesneriads can be grouped within this category.

The “perfect” soil mix for gesneriads does not, in fact, exist: there are only good mixes and bad mixes. Generally speaking, any grower-mixed potting soil which intelligently takes into account a plant’s needs can be considered a “good mix”, while any commercially produced or packaged mix can probably, in all likelihood, be considered a “bad mix” which, because it lacks accurate labelling, will require a lot of guesswork and tinkering to make it suitable for growing gesneriads.

Growers continually strive to perfect their soil recipes, and their successes or failures are linked as much to their growing conditions and practices as to the quality of the various soil components they use.

A suitable potting mixture for gesneriads should promote growth by covering four basic functions: firstly, it must be in sufficient quantity to anchor a plant; secondly, it must retain and provide moisture; thirdly, it must provide nutrition in a form that the roots and plant can absorb; and fourthly, it must be porous enough to hold a sufficient amount of oxygen to ensure the plant’s survival.

A good potting mixture is described as having the following characteristics: loose, fluffy, light, porous, well-drained, friable, coarse and slightly acidic. Growers achieve this by mixing and combining together various types of organic and inert ingredients.

Organic materials include, for example, sphagnum peat moss, and charcoal, while inert ingredients include such materials as perlite, and vermiculite. Roughly speaking, organic material such as peat moss should constitute approximately one third to one half of a good soil mix. The remainder of the potting mix should be made up of inert materials such perlite and vermiculite.

Cultural factors such as watering, temperature and humidity impact heavily on the amount of organic material which should be used in a mix. For example, if a grower has a lower than average humidity (less than 40%), cooler temperatures and a somewhat erratic watering schedule, he or she may choose to grow their plants in a mix containing at least 50% organic material. By doing so, the grower is ensuring that their plants and soil retain moisture for longer periods thus preventing drying-out damage between waterings. On the other hand, a grower with wetter conditions (60%+ humidity), an average to higher than average temperature range, and a regular watering schedule may choose a mix containing substantially less organic matter, i.e., 30%, thus preventing pathological conditions such as mold, mildew, or fungus from cropping up in their plant collections.

Presented below is a general and very basic discussion of potting mix components and their various uses, as well as a soil mix recipe tailored to meet local cultural conditions. All of these materials are available locally and in the right proportions will produce healthy, blooming plant material. As mentioned above, there is no perfect soil mix and factors such as humidity, temperature and watering will impact on the success of any potting mix. In addition, no attempt has been made to discuss potting mix materials which, although successfully used and tested in other regions, are either untested or not available locally.

*“We use the term **soil** for any medium used for growing plants.*

*It is a common fallacy to attribute to natural soils (loams) a high nutritional content.*

*In fact it is normally very low. Even compost and humus have little free chemical content and are essentially soil conditioners.”*

V.F. & G.A. Elbert, Authors,  
The Miracle Houseplants

*“Using the word **soil** in reference to soilless potting mixes is a form of horticultural shorthand for the awkwardly long term of “soilless potting mix”.*

*Few growers now include natural soil or loam in potting mixes.”*

Pauline Bartholomew,  
Author, Growing to Show,  
How to Grow Prize-Winning  
African Violets



# POTTING MIX COMPONENTS

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*“Perhaps because I grow and care for so many plants. I like a coarse soil.*

*I didn't have good results when I mixed my own soil until I made it so coarse that it almost seemed ridiculous.*

*But the plants don't know it and they grow beautifully.*

*I've also found that because my soil is so coarse, there's always plenty of oxygen in it and I rarely lose a plant from root rot.”*

Ethel Champion,  
AV Hybridizer and AVSA  
Bronze Medal Winner

*Every good potting mix begins with three basic ingredients: perlite, sphagnum peat moss, and vermiculite.*

Every good gesneriad potting mix begins with three basic ingredients: perlite, sphagnum peat moss, and vermiculite.

Perlite is a white mineral product derived from lava rock. It is a lightweight material which resists compaction and provides aeration in any potting soil. As a result, it is very useful in potting mixtures. Perlite has no nutritional value and little, if any, nutrient holding capacity.

Sphagnum peat moss is the least decomposed of all the peats commercially available. It can be finely or coarsely milled: peat moss that is dustlike in quality is said to be finely milled and is suitable for seedlings and immature plant material while peat moss which contains easily recognizable plant parts such as roots, leaves, and stems, is said to be coarsely milled and is suitable for mature or robust plant material. Peat moss is an excellent source of organic matter and will increase the water retention and nutrient holding qualities of any potting mixture. In mixing potting soil, growers should avoid commercially available peat moss bales which are normally used for outside landscaping, or sold for general garden use.

Vermiculite is a mineral derived from mica. It is a lightweight material which provides bulk or texture, i.e., coarseness, to soil mixes. In addition, it has excellent water and nutrient retention qualities. When used in soil mixes, vermiculite releases quantities of potassium, calcium and magnesium.

In addition to the three basic ingredients discussed above, other organic or inert materials can be added to tailor or complement a potting mix. Such ingredients include charcoal or activated carbon, pumice, lime, styrofoam beads, and long-fibre or sphagnum moss.

Charcoal helps balance the acidity of a soil mix by absorbing large quantities of acid-forming products. If obtainable, growers should use a fine to medium grade of charcoal in their potting mixtures. Lacking a good grade of charcoal, activated carbon of the type used in aquarium filters is a good substitute.

Pumice is a mineral product derived from volcanic rock. Its aeration qualities are excellent, and it can be incorporated into mixes for potting up plant material preferring a less acidic growing medium.

As with pumice, lime or calcium in the form of slow release dolomite chips or crushed eggshells can be used in mixes for less acid loving plant material. Growers should avoid using fast-acting limes in potting mixtures. These include calcite, calcium oxide (quick lime), hydrate lime (slag lime) or powdered horticultural lime.

Styrofoam beads or polystyrene pearls are relatively new to the horticultural field. They are inert with no moisture or nutrient retaining qualities. They do, however, have excellent aeration qualities as well as providing texture to a soil mix. Styrofoam beads from 2mm to 3mm in diameter are recommended.

Sphagnum or long-fibre moss has been widely and successfully used in growing tuberous, rhizomatous and epiphytic gesneriads. It should not be confused with sphagnum peat moss, the decomposed product of sphagnum moss. It comes in three forms: live, dried, and milled and has excellent water retention qualities. In addition, it provides good aeration as well as coarseness or texture to a potting mix.

For the average grower, incorporating non-essential horticultural materials into potting mixes is not advised. These products are of dubious value and include items such as blood meal, sand, bone meal, composted steer manure, earthworm castings, superphosphate and fritted trace elements. The growing of good quality plant material doesn't require these elements, and they're most probably best left to forlornly gather dust on store shelves.



## RECIPE FOR A BASIC SOIL MIX

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The following recipe is time-tested, reliable and suitable for growing all gesneriads. Because all the materials are "sterile", pasteurization either by heat or microwave treatment is not necessary nor required..

With the addition of 3 tablespoons of crushed eggshells and 4 cups of chopped dried sphagnum moss, it makes an exemplary potting mix for kohlerias, sinningias and any of the epiphytic gesneriads. In the case of chiritas and petrocosemas, it becomes suitable with the addition of 1 cup of coarse pumice and 3 tablespoons of crushed eggshells.

**10 cups Bell's Seedling Mix\***

**8 cups vermiculite**

**8 cups perlite**

**4 cups styrofoam beads (2mm to 3mm in size)**

**1 cup charcoal or activated carbon**

\* Finely milled peat moss and vermiculite, thoroughly moistened with 1 litre of hot water.

Mix enough soil to meet your potting needs over the next month. Keep potting mixture moist and lightly sealed. Stir occasionally to keep ingredients incorporated.

Please note that the combination of ingredients in this mix results in a potting mixture which is 35% organic and 65% inert.

With the exception of styrofoam beads and activated carbon, basic soil mix materials and ingredients can be purchased at local garden centres, e.g., David Hunter Ltd. Styrofoam beads can be purchased through the Society (Peggy Brenne), and activated carbon can be purchased at your local Tisol dealer or pet store.



## REFERENCES

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Gesneriads: The Miracle Houseplants, Viriginie and George Elbert  
Growing to Show, How to Grow Prize-Winning African Violets, P. Bartholomew  
African Violets: Gifts from Nature, Melvin J. Robey  
Houseplants and Porch Gardens Magazine, June 1976

*"Growers speak of "soil mixes" and "potting soil". Actually, what they are referring to is "soil-less" or synthetic growing medium."*

Melvin J. Robey, Author,  
African Violets: Gifts from Nature.

*"There are advantages to mixing your own soil: the manufacturer won't go out of business; the supplier won't quit stocking the brand; the mix is always on hand; and the savings are considerable. Plus, the grower has quality control: sometimes manufacturers of long-established brands substitute cheaper, less desirable materials to avoid raising the price of the mix."*

Pauline Bartholomew, Author,  
Growing to Show, How to Grow Prize-Winning African Violets

*"If you do not create a light, well-aerated potting mixture that drains well, your gesneriads will not perform satisfactorily for you."*

Melvin J. Robey, Author,  
African Violets: Gifts from Nature.