The Facts on Potting Soil for Indoor Plants

by Sylvia Sloan, Fairfax Master Gardener

High quality soil mix is required for healthy plant growth and usually includes slow-release fertilizers that supply the plant's needs for a few months. The soil must retain sufficient moisture while allowing air and water to pass through. It must be free of diseases, weed seeds and insects. Garden soils contain too many bacteria and are generally not recommended for plants grown in containers.

photo: Purdue University Extension

Commercial potting soils are usually composed of organic components such as peat moss or pine bark. Coconut coir may be used as a substitute for peat moss, which is less sustainable. Inorganic materials, such as perlite, vermiculite or sand help to provide aeration, improve drainage and retain moisture. Fertilizers are the primary source of nutrients, and may be all-purpose time-release fertilizers, synthetic blends or nutrient-dense organic amendments such alfalfa meal, bone meal and kelp meal.

photo: Carl Johnson, University of Connecticut

Vermiculite

Vermiculite is a sterile, lightweight mica product. Mica is a mineral found in rock, and is one of the ingredients of granite. It easily splits into crystals that form large flat elastic sheets. When heated, it expands and its structure can form small pockets for holding air, water and plant nutrients, preventing the soil from cementing itself hard. Vermiculite will collapse with time and lose the characteristics that make it a good ingredient for potting soil.

Perlite is similar to vermiculite. Perlite, however, is a white volcanic mineral glass that is mined from the earth. When used as a soil amendment, its porous structure helps regulate water by improving aeration and water drainage. It does not hold water and nutrients as well as vermiculite, but creates air pockets for roots and allows excess water to drain away.

photo: Carl Johnson, University of Connecticut

Perlite

The mixes are designed to keep the soil from becoming too compacted, which can suffocate roots and impede the flow of water and nutrients. A high-quality potting mix will be lighter weight and fluffy, with the ability to hold moisture. There are many different types of all-purpose blends, as well as more specialized mixes.

The type of plant will determine the type of potting soil you need. If you have a fast-growing plant that requires a lot of water, then you

will want soil that holds more water. Conversely, if you have a plant that grows better on the dry side or is slow-growing, then you will want a soil that holds less water.

- Cactus and succulents
  These are low-water plants and prefer soil that dries out quickly. These mixes contain a higher ratio of perlite, sand or other inorganic material to provide optimal drainage and allow air to the roots.
- African violets
  These flowering tropicals prefer a warm moist environment that simulates their native jungle habitat. They prefer a mix formulated for extra aeration, improved drainage and moisture retention.
- Orchids
  Growing on tree bark in tropical rainforests, orchids prefer a soilless potting mix made primarily of bark chips or sphagnum moss. Charcoal and perlite may be added to improve drainage.

If you are interested in making your own mix, there are several "recipes" in the References. One example is the Clemson Plant Mix. It contains 2 parts pine bark (soil conditioning grade), 1 part peat and I part sand. This mix should first be adjusted to a pH of about 6.0 with dolomite limestone. A water soluble fertilizer (20-20-20) should be given every seventh watering.

Poor drainage is one of the most common reasons why indoor potted plants die. Even though the soil is dry at the top, the pots without good drainage retain water in the bottom, resulting in root rot. There are several types of containers. A good container should be large enough to provide room for the root ball and root growth, and have sufficient room above the soil line for proper watering and provide drainage. Containers may be made from a variety of materials, including clay, ceramics, plastic, fiberglass, wood, aluminum, copper and brass.

Some plants are characteristic hosts for problematic pests. For example, palms are especially prone to mites, and Hindu rope (hoya) plants are especially prone to mealy bugs. One can easily miss an incipient infestation on a recently purchased plant. Thus, any new plant that is known to be especially prone to a difficult to control pest should be quarantined for at least a few weeks to make sure your plant is not infested.

To quarantine a plant, place it in a room without plants that is not adjacent to a room with plants (pests can be transported by drafts). After time, this separation will allow you to determine if you have a pest problem without infesting the rest of your indoor plants. You will also need to make sure that you do not unknowingly transfer a pest by handling your new plant and then handling your resident plants.

Fungus gnats are another pest problem although they do not actually harm plants. They emerge from the soil and inhabit the soil. They do not readily fly, but will be seen on the surface of the soil when it is disturbed. Although the adult gnat's presence is considered a real nuisance, its larvae could damage a plant's roots. You may see symptoms of this infestation in your plants, including sudden wilting, loss of vigor, poor growth and yellowing. Any plant is a target, but African violets, geraniums, carnations, cyclamens and poinsettias are especially prone to this attack.

While fungus gnats can come in from the outside with the plants you bring in for the winter, they usually hitchhike home in newly purchased plants or soil infected with eggs. Before purchase, turn up soil near the base of a potential new plant and look for glossy larvae or flying gnats. Regardless of whether you see the gnats, it is a good thing to isolate any new plant for a few weeks and especially those coming in from outside.

Adult gnats live about one week and can lay up to two hundred eggs during their short lifetime in moist potted plant soils. Within four to six days, tiny larvae emerge and feed on plant roots during their two-week stage as larvae. Their

pupal stage lasts only three to six days. Then young adults leave the soil and begin the next generation. The entire life cycle from egg to adult may be completed in as little as three weeks, depending on temperature.

References

- Indoor Plant Culture, Alex X. Niemira, Virginia Cooperative Extension (426-100)
- Growing Media (Potting Soil) for Containers, Debbie Shaughnessy and Al Pertuit, Clemson Cooperative Extension
- Homemade Potting Media, Jim Sellmer, Penn State Extension
- Rid Yourself of Nasty Gnats, Gil Medeiro, Fairfax Master Gardeners