MONTHLY TIPS

BONSAI SOIL—WHAT IS IT?

Nothing can stir debate like the discussion of bonsai soil. Michel said that if you ask 10 different bonsai enthusiasts what the best bonsai soil is, you will get 10 different soil recipes. Many will agree with this statement. Having said this, it is difficult for a beginner in bonsai to know where to start.

"What should I use?" "Where should I get it?" "Is the soil important?"

These are just a few of the questions you may be asking. The following is a beginner's guide to bonsai soil, which may help to answer these questions. It is not an exhaustive study, nor is it complete. It is not intended to be. You will need to do further research and experimentation to find out what works best for you.

I want to thank Michel, Glider, and Ryan especially for contributing (perhaps unknowingly) to the information in this article, but also to the BonsaiChat membership as a whole. It is through a community such as this that we all continue to learn and grow.

MONTHLY TIPS

What is "Good" Bonsai Soil?

In general, whatever soil mixture works for you, in your climate and conditions, with your trees, giving you the results you want, and avoiding soil-related problems, is good bonsai soil. That is why someone from another country or part of the same country cannot tell you which soil mix is "best." Of course you can experiment, but someone from your area who has been growing bonsai successfully for a few years will be the best source for a starting recipe.

Good soil must
- be non toxic
- retain water according to the plants needs
- stay free draining according to the plants specific needs
- allow an everlasting interchange of air and water flow
- allow roots to grow freely in it
- allow a plant to anchor itself in it
- preferably contain organic food and spore elements
- preferably have a pH-value suiting the specific plant
- preferably be cheap and readily available
- and last but not least, preferably look nice !

Soil Particle Size:

Good bonsai soil contains particles which are neither too large nor too small. The size used for a particular tree depends in part on the size of the tree and whether it is being developed or maintained.

Why does it matter? Water is retained on the surface of soil particles. The more surface area a particle has, the more moisture (and nutrients) it can hold. That's one reason irregularly shaped particles are preferred to those with a smooth surface. Consider a particle of lava compared to a polished river pebble. It therefore follows that the larger the particle, the more moisture it can hold. Unfortunately, it isn't as easy as that. This size-to-moisture-retention ratio tends to break down due to other factors.

As the particles get larger, fewer particles can be contained in the pot and between the roots of a bonsai. This is inefficient for root growth, as the spaces between are too large to maintain proper humidity, and the soil dries too fast. The smaller the particle, the closer together they fit, and water will tend to fill the spaces instead of air due to capillary action. Both extremes result in poor root growth and a sick, if not dead, tree.

To avoid these problems, bonsai soil is screened. This means that the particles are passed through differing sizes of metal screen to separate them by size. In general, particles bigger than 3/32 inch, (that which doesn't pass through an ordinary window screen) and smaller than 1/8 inch are used for medium to small bonsai, and particles between 1/8 inch and ¼ inch are used for medium to large bonsai. Particles from ¼ inch to 3/8 inch are usually reserved for the largest trees. This is only a rough guide, however, and you will find many exceptions to this. You can purchase inexpensive soil screens at many bonsai retailers, or you can make your own from wood, window screen, and different sizes of hardware cloth.

Soil Components:

Beginners hear many different ingredients listed in various soil recipes. These terms can be confusing to say the least. What follows below is a list of soil components along with a discussion of each.

Decomposed rock: this is rock that has been degraded into gravel or sand by weathering or crushing. This component serves primarily to maintain the open, airy structure of soil, and to provide sharp edges which increase root ramification. The more irregular or porous it is, the more moisture it will retain as well. Another purpose is to provide some weight to the mix in order to allow the roots to better anchor the tree.

Lava: I think everyone knows what this is. Hard and highly porous, it is an excellent way to accomplish several jobs at once: water retention, root ramification, and maintenance of soil structure. I can't find this product locally, so I use other materials.

Crushed slate: I purchased 240 pounds (about three, 5-gallon buckets) at a local landscaping stone store for $19.00. It was sold as rock mulch. Color is dark gray to dark brown to dark reddish, and is sharp and irregular.

MONTHLY TIPS

Crushed slate: I purchased 240 pounds (about three, 5-gallon buckets) at a local landscaping stone store for $19.00. It was sold as rock mulch. Color is dark gray to dark brown to dark reddish, and is sharp and irregular.

Haydite: This is crushed slate that has been fired at about 5000 degrees. When treated like this, it expands and becomes very porous, which allows it to hold more water than the unfired slate. It actually looks (and functions) roughly similar to crushed lava rock. I use this in my in-ground growing bed.

Chicken grit: I am referring to the crushed granite type, rather than the crushed oyster shells. It is sold at feed stores in 50 pound bags (I pay about $6.00 per bag), which are pre-sized based on the size of chickens. I use "grower" or "developer-layer" sizes. I still need to screen out some dust, but get about 90% usable material. The nice thing about granite is that it has lots of sharp edges, which cause the roots to divide more, which in turn causes more branch ramification on top.

Sand: I get 20 pound bags for about $7.00 at a local department store, sold as "filter sand" for swimming pools. I get about 75% usable material. The grains are small, up to about 1/8 inch diameter, but with sharp edges, which is good for smaller trees, rooting, etc.

Perlite: It looks like Styrofoam, but it isn't. This is a volcanic glass which, when heated to 1600 deg F, expands and becomes very porous similar to haydite. Likewise, it retains lots of moisture. On the downside, its light weight tends to make it float up and out of the pot when watering, and the white color can be distracting on the soil surface.

Vermiculite: A mineral similar to mica which, like haydite and perlite, expands and becomes porous when heated. It also retains moisture well, but it is not as durable as perlite and it is also light in weight. On the plus side, its color is not as noticeable as perlite.

Organic components: Portion of the soil mix which was once "alive." This is used for water retention and as a source of slow-release nutrients.

Pine soil conditioner: This is partially decomposed pine bark which is small in size and easy to screen. It is the primary organic component of my soil mixes. I get about 50-75% usable material from each 2 cubic foot bag (depending on quality), which costs under $6.00. You can get it at many garden or landscaping centers.

Composted fir or hemlock bark: Similar to pine soil conditioner. These products tend to be available (or unavailable) locally. I have no way to get fir or hemlock bark where I live, so pine soil conditioner it is.

Peat: This is organic matter which is partly decomposed under anaerobic conditions, usually obtained from bogs. I use this more with tropicals and other trees that need a lot of moisture. You can count on about 50% usable material from each bag, which will cost about $2.00. Any garden center will have this. It will hold lots of moisture, but won't release it readily. Therefore it tends to stay wet. Once it dries out, it is very difficult to wet again. Most people only use it for species which like "wet feet."

Potting soil: There are many different brands, many based on peat, perlite, and/or vermiculite. Some drain better than others, and some contain fertilizer. Beware of what your soil contains to avoid future problems.

Clay/soil: I classified this separately as it is different in source and composition from the other components listed above. The main difference between clay and sand is the size of the particles, with clay having extremely small particles. These stick together and, when fired, become inseparable. The primary purpose of this component is water retention, and to a lesser extent (depending on what you use) for soil structure.

Turface MVP: This is high-fired clay used to improve turf on playing fields. It absorbs lots of moisture, which keeps the fields from staying soaked, but it also provides extended-release moisture in pots. It is fired at high temperature to help it retain its shape and size. This stuff does not dissolve. I get about 90% usable material from each 50 pound bag, which costs about $9.00 at landscaping stores which also specialize in turf.

Akadama: Particulate clay dug in Japan which has excellent drainage properties. It is available in hard and soft fired versions through bonsai retailers. The soft akadama is just flash fired to remove organic matter, allowed to dry, then sifted and bagged. The hard akadama is fired at a certain temperature and is a hard granule. The soft holds more water than the high fired, and will break down quicker, but the high fired drains better and lasts longer. "Double-Line" brand is considered the best. Some say that it binds chemical fertilizers, making them unavailable to the plant, and that organic fertilizers are better used instead.

Kanuma: Another particulate clay from Japan which is more acidic. It is used exclusively by many azalea growers and is a good choice for all acid-loving plants. It is easily crushed to powder in the fingers, but stays together, almost gel-like, when wet.

Loam: This is soil from the ground which is composed of the ideal ratio of sand, clay, and organic components. An example is rich, fertile garden soil. Using this material involves some risk, though, as it may contain any number of pests, diseases, or chemicals.

(Ed's Note: The above article was written by our own Scott Showalter and will be continued in next month's newsletter.)