

Proper Fertilization Techniques For Bonsai

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A proper program of fertilization is important for the cultivation of all types of plants, but is of particular importance when growing bonsai. There are two reasons for this. First, bonsai are grown in containers. This means there is very little space available from which the roots can obtain nutrients. Secondly, the soil mixtures traditionally used for proper bonsai cultivation are made up primarily of drainage materials (sand, rock, hadite, turface, etc.) and do not contain large amounts of organic materials that would hold onto nutrients or decompose and release nutrients into the soil.

It is therefore important to place your bonsai on a regular feeding schedule during the growing season. The plants require nutrients when they begin to grow and push buds in the early spring, and will continue to require feeding throughout the summer and into the fall (although in the fall the type of nutrients you provide will change (see below). Feeding may be discontinued during the winter months for all temperate plants and greatly reduced for indoor/tropical varieties. A temperate plant which has gone dormant for the winter, (dropped its leaves), is "sleeping" and like a hibernating bear, does not require food. Pay attention however,... when the bear and the bonsai wake up in the springtime, they will both be hungry.

Nutrient Forms

Generally speaking nutrients for your bonsai are available commercially in two forms, organic and inorganic. Which type you use is largely a matter of personal choice. We will discuss the pros and cons of each below. Regardless of which form you choose, they should all include both macro and micro nutrients.

Macronutrients - Nitrogen, Phosphorus & Potassium

All fertilizers, whether they are organic or inorganic in nature must contain the three primary elements vital to the trees health. These are Nitrogen, Phosphorus and Potassium. The amount of these ingredients which any given fertilizer contains is reflected in a series of three numbers, usually printed on the package. For example: 15-10-6 indicates that the fertilizer contains 15 parts Nitrogen, 10 parts phosphorus and 6 parts Potassium. The numbers may vary depending upon what you buy, but the order will always remain the same... Nitrogen first, Phosphorus second and Potassium third.

Nitrogen

Plants usually absorb more nitrogen from the soil than they do other elements. It is nitrogen that produces rapid growth and gives the leaves and stems a healthy, deep green color. If a plant has insufficient nitrogen, the newer shoots will use up whatever nitrogen there is, caus-

ing the older leaves to turn yellow. Young plants which need to develop are usually fed a high nitrogen fertilizer to promote abundant green growth. More mature bonsai are fed with a mixture which contains reduced amounts of nitrogen.

Phosphorus

Plants need phosphorus during all phases of their growth. However, this element is particularly needed for the formation of seeds, flowers and fruit. It helps the plants to store energy for the coming winter and to harden off roots and buds. It is therefore a good idea to feed your bonsai with a fertilizer high in Phosphorus (superphosphate) in the latter part of the growing season (late summer to fall). High nitrogen fertilizers used in the fall would only produce soft green growth which would freeze off during the first frost.

Potassium

Potassium or potash, is essential for plants because it helps them to increase disease resistance. It improves stem and trunk rigidity and it helps plants to overcome poor weather or soil conditions. It generally makes plants more vigorous.

Micronutrients

No matter what their form, all fertilizers contain some or all of the nutrients elements that bonsai need in order to grow. There are 16 beginning with carbon, hydrogen and oxygen which are generally provided by the atmosphere. The macronutrients of Nitrogen, Phosphorus and Potassium and micronutrients which include: calcium, copper, iron, manganese, molybdenum and zinc. These micronutrients are essential to the plants health, but are only needed in small amounts. Many commercial fertilizers come with micronutrients added or micronutrients can be purchased separately and added to the soil in bonsai containers on a yearly basis.

Organic Fertilizers

Organic fertilizers improve soil structure and release plant nutrients slowly, which reduces the possibility of overfertilizing (a definite advantage for new, overzealous bonsaists). The normal procedure is to make small balls or cakes of the desired organic substance and place these cakes on the tree. However, since they are organic in nature they can grow unwanted fungus or mold and serve as a home for insect larvae. Sprinkling a little powdered insecticide helps keep this under control. How well they work depends upon how warm the soil gets and the level of microbe activity in the soil. Those most commonly used for bonsai are:

Bone meal: This decomposes slowly and releases phosphorus. Its natural alkalinity helps to neutralize the acidity of peat-based or acidic soil mixtures.

Cottonseed meal: This is a slightly acidic by-product of cotton manufacturing. It is good for use on acid loving plants such as azalea, camellia and rhododendron.

Blood meal: This is dried, powdered blood from cattle slaughterhouses and is a very, very rich source of nitrogen. It also contains several trace elements. You should be careful to not overuse this product.

Fish Emulsion: This blend of partially decomposed, finely pulverized fish is high in nitrogen and also contains several trace elements. You can boost plant growth by applying it in late spring, but like the blood meal, it is easy to burn your plants with this product... be careful. A special caution should be observed if you have raccoons living in your neighborhood. We can personally relate the tale of a raccoon in our back yard who unpotted about 6 of our bonsai that had been freshly fertilized with fish emulsion because he was certain that we had hidden a fish in the pots. Inorganic Fertilizers

Inorganic Fertilizers

Inorganic fertilizers (chemicals) come in different forms: dry, liquid, slow-release, pelletized, plant stakes and soluble solutions, among others. Both the forms and formulations available in the marketplace are extensive and permit you to choose according to your own preferences. You may like a dry fertilizer to incorporate with a potting soil mix or a liquid fertilizer to apply from a hose. Still others may opt for a slow-release fertilizer that needs to be applied less frequently. The actual fact is that most bonsaists choose to vary their feedings with both organic and inorganic fertilizers.

Fertilization Frequency

Here at the Bonsai Learning Center we fertilize our trees on a bi-weekly basis. Because of the large number of plants we must fertilize, we have chosen to use a chemical fertilizer which can be applied through a hose siphon system. We don't believe its better... or worse,... just more efficient for our purposes. Because we are not always as dutiful about applying fertilizers as we should be, we also supplement these feedings organic fertilizers of the type described above. Nursery stock which we are trying to get to develop growth quickly is usually fertilized with a high nitrogen chemical time release fertilizer such as osmocote. If you don't have the time or inclination to make your own fertilizer cakes there are a number of manufactured products in the market which will work as well.

The debate between bonsai people over what type of fertilizer works best has always been a hot one. In the final analysis, you will have to make your own choice. What you use is immaterial to the plant so long as you provide the required micro and macro nutrients described above, in a form your bonsai can absorb. Many people believe that varying the types of fertilizer they use on their bonsai. They reason that although "steak" tastes great they would not want a steady diet of it. Whether that logic holds up in the plant kingdom remain to be seen. Whatever you

decide to feed you bonsai, the important things is to make sure you are doing it on a regular basis.

16 Elements for plant health

Primary

carbon
hydrogen
oxygen

Macronutrients

nitrogen
phosphorus
potassium

Micronutrients

boron
chlorine
copper
iron
manganese
molybdenum
zinc
cobalt (?)

Secondary nutrients

calcium
magnesium
sulfur

The Big Three

These elements will be displayed on the label of every fertilizer you purchase as a series of three numbers separated by hyphens indicating the concentration of each particular element in that particular brand of fertilizer.

Nitrogen

Promotes rapid growth of foliage
Encourages healthy deep green color

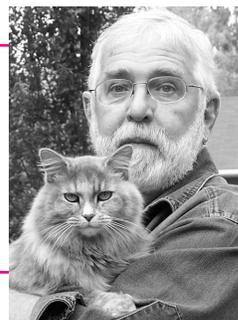
Phosphorus

Helps to form seeds & fruit
Increases root growth and hardiness
Increases resistance to disease

Potassium

Increases disease resistance
Increases tissue rigidity
Increases plant vigor
Overcomes poor soil

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