

Using Principles of Growth to Manipulate Plants for Bonsai

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By Brent Walston

Introduction

This is an article that will show you how to apply basic concepts of plant growth to bonsai training techniques. Growing plants for bonsai means developing a nursery plant to the point of final styling and placing it in a pot. These plants have a variety of names, i.e. pre-trained or pre-bonsai, etc. The idea is to grow a plant specifically for bonsai rather than landscape. Since our ends are very much different than landscapers the techniques are also very much different. Some plants, such as pines need special attention from the very beginning to become good bonsai, others such as most deciduous trees are much more forgiving and may still be used after achieving some size, but without any previous bonsai training. The approach that I would like to take is that of explaining and applying plant growth principles so that you may apply these principles and concepts to your particular situation. Once understood, these principles are a very powerful tool for manipulating plant growth. And bonsai is probably the epitome of plant growth manipulation.

Principle 1:

Leaves (needles) increase the size of the woody parts of the plant and the size of the roots. Well, that seems obvious. But most of us fail to use this concept to its maximum advantage. If you want a really large trunk, don't prune your plant. The removal of leaves will only slow it down. This is of course over-simplified but nonetheless true. If you root prune a plant, leave as many leaves as the roots can support to generate new roots as quickly as possible. If you do this while a deciduous plant has its leaves, you must reduce the foliage comparably to prevent overtaxing the root's ability to supply water. It is imperative to keep the plant cool while new roots are being regenerated. Leaving the entire stem of deciduous plants works particularly well for bare-root plants or severely root-pruned dormant deciduous plants. The remaining roots will only stimulate as many buds as they can support, so do not top prune the plant. (See the article "Root Pruning Bare Root Seedlings")

Principle 2:

Leaves manufacture plant food, roots store plant food. OK, obvious again, but what are the ramifications? Top pruning a plant at the end of the season (fall or winter) leaves all of the food intact to stimulate new growth in the spring. A full complement of food with no where to go will stimulate new buds and the new growth will be explosive and coarse, some deciduous plants may send out an eight foot sprout one inch thick in a single season (or more!). Severely top pruning a plant just after it leafs out in the spring uses up most of the stored food because the roots must send out a second burst of food to stimulate even more buds. This depletion will cause very weak new growth and will slow the plant down. Not pruning a plant in winter or spring leaves the maximum number of buds to be stimulated into flowers and leaves and twigs, this taxes the roots to the fullest and will produce the smallest leaves, and the closest internodes (spaces between the leaves) on the new stems. Confining roots, as in a bonsai pot, limits their ability to store food, which in turn will diminish the leaves and internodes even further. This is the basic mechanism for dwarfing a plant in bonsai.

Principle 3:

Small twiggy growth will always remain small and twiggy. This principle is not so obvious and is in fact frequently overlooked by bonsai folk. What I mean is that, when a small twiggy branch appears as the result of restricted growing conditions it will always keep this character, even if the plant is rejuvenated by repotting or planting in the earth. New growth will be coarse and vigorous with long internodes and large leaves, but the twiggy branch will be unaffected. Thus you can grow a bunch of nice small branches low on the tree, plant it in the ground and grow a sacrifice branch or leader to increase trunk size enormously, come back and cut off the sacrifice branch and have a big trunked tree with nice small branches. However this will only work if you do not allow buds from the small branches to break into a water sprout or coarse growth. The branch will remain twiggy but its diameter will increase until it is unusable.

And finally, these few principles may sound simplistic, but they are the entire basis for manipulating plant growth in bonsai. You will need to think about them carefully to be able to apply them effectively. To see how their application can work for leaf and stem reduction see the article "How to Reduce the Size of Leaves".