

BONSAI –“IN A NUT SHELL”.

Forward:

This is an extract from the proposed book covering bonsai in the Southern Hemisphere and its companion bonsai dairy adapted from the book “Growing Bonsai in South Africa” by Doug Hall and John Haw.

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What is a Bonsai?

Like history, we get various interpretations, but in general it is recorded that some two and a half thousand years ago the Chinese dug out beautiful ancient miniature trees for bonsai, (penjing*) growing in the rock crevices of mountain cliffs. Their roots being weathered short due to the extremes of the rock temperature, lack of soil and nutrients.

Their branches weathered white and leaves in tuft by the elements. The same huge species of trees are found growing in the forests at the foot of the cliffs.

As bonsai enthusiasts we try to copy nature but not as successfully by regular root pruning, using small pots to control growth and miniaturize proportion. Then style the branches into the various established styles, many of which simulate those dug out from the mountain cliffs, just like those stunning photographs of bonsai we see in books, with their stark white weathered trunks and green foliage clouds.

It is a “living Art Form” miniaturizing nature within our grasp, therapeutically rewarding.

Japanese Bonsai versus Chinese Penjing.

Bonsai means a “miniature plant in a container”.

*Penjing or Penzai means a “miniature tray scenery”.

The living art of Chinese Penjing over time moved east to Japan where the Japanese refined it into bonsai as we know it today. The Europeans and Americans took it west where today bonsai are universally created, both as a hobby and sold commercially.

Understanding Bonsai.

- Bonsai are not mushrooms! that grow in the dark, they require UV light from the sun for photosynthesis. (The light that gives as sunburn.)
- Tinted windows in houses or offices reduce the UV light by as much as 80%, so your bonsai will drop its leaves in two to three weeks.
- Air conditioning dehumidifies and cools the air, in turn drying out your bonsai leaves. Next time walking down town, note the water dripping out of the air conditioners.
- Thatched roofs are used to keep cool and keep the sun out, so your bonsai will not do well under thatch.
- Hothouses are used to accelerate plant growth, but bonsai need to mature and harden-up slowly with leaves kept small, not to become fragile, leggy with big leaves as they would under a hot fibreglass or zinc roof.
- Windowsills As children, we used a piece of glass as a magnifying glass held to the sun, directing it onto a piece of paper to burn a hole in the paper. Well, now make sure you have a lace curtain between your window and bonsai to avoid scorching it's leaves and to stop excessive water evaporation.
- Bonsai are not succulents that grow in the desert with very little water. They require sufficient shade and water to keep the soil moist. Small bonsai are best kept out of the direct sun between 10h00 and 15h00 under shade netting or an evergreen tree. Large bonsai should be strategically placed, shaded at critical times of the day by a wall, tree or other, unless their own foliage provides sufficient shade.

Points of interest.

Famous words: I had a bonsai, but it died!

It's never beautiful, pretty or another word, It's always a “Stunning Bonsai”.

Commercial Bonsai verses Professional Bonsai:

As a rule of thumb, commercial (young bonsai) have 20% root and 80% soil in their pots, whereas Professional (mature) bonsai have 80% root and only 20% soil in their pots, which approximately 15 % is gravel.

Accordingly, re-potting frequencies are different.

Professional bonsai should be re-potted every year or second year whereas commercial bonsai as per re-potting/potting time table i.e. between two to six years for soft to hard wood trees. Other factors can also influence the re-potting frequencies.

Watering – How to:

- There is only one way to water a bonsai and that is thoroughly, daily or every second day, until it runs out of the pots drain hole/s, or according to their size and placement. During winter water frequency is reduced, especially for deciduous bonsai even though they do not have any leaves.
- Consider the “root ball” being like a sponge, which must be wet thoroughly until the water runs out of the drain hole/s taking oxygen and nutrients down to the roots. If insufficiently watered only the top half of the sponge will be wet with the bottom half left dry, as would the soil.
- As there is no water flowing through the lower soil it gradually dries out reaching up to the roots, drying them out and killing the bonsai. It will also be noticed that less water will be absorbed by the soil each day you water.
- Subject to the quality of the soil (bonsai mix) if not thoroughly watered, on removing the dead bonsai the dried up soil at the bottom of the pot will be just as hard as the ceramic pot itself.
- Bonsai do best with sprayed/fresh (Aerated) water rather than drip watering. Do not dunk when watering, but dip, scooping up the water with the pot. Dunking displaces the air in the soil making mud.
- Boiled tap water helps but not that important, however never use water that has stood for more than seven days, unless aerated.
- Rain water is a godsend, but if only tap water is available, it has to be used.
- Your bonsai is not a water lily, its roots will rot if left standing in a saucer with water. Throw the water out of the saucer (drip tray) after it has drained off.
- Bonsai with many small leaves, especially simple leaves, consume more water than those with big leaves because of their large combined leaf surface area.
- Certain bonsai have to stand in water during summer when in full leaf, mainly those that in nature grow in swamps, i.e. swamp cypress, melaleuca etc.

Bonsai Fertilizing:

- Beware, always fertilize strictly accordingly to the manufacturer’s instructions on the container i.e. mixing proportions and frequency. Never give more especially if using ordinary garden fertilizer.
- Fertilizer made for bonsai is best, be it organic, chemical, granular or liquid,
- Fertilizers consist of macro (N:P:K). and micro or trace elements. The macro are: (N) Nitrogen – the leaf maker. (P) Phosphorous – the root maker. (K) Potassium – the flower and fruit maker. Micro or trace elements (e.g. Iron, magnesium, zinc etc) are all essential.
- For young commercial bonsai use a “General Purpose” fertilizer through out the growing season. For professional bonsai, start in spring with a high to medium nitrogen content fertilizer for foliage and flower development. By mid summer move to a low nitrogen fertilizer, but high in phosphorous for root development and strengthening for winter. Stop about the end of April or if their leaves have fallen.
- Fertilizer types and combinations used vary according to the plant species and how you want your plant to respond.
- In general, commercial evergreen or deciduous bonsai are not fertilized during winter as they are dormant (sleeping). You do not eat whilst you are sleeping.

- However, professional evergreen very old bonsai or if you live in the northern hemisphere can be given a zero nitrogen fertilizer 0.10.10. You do not want foliage growth, but root growth during winter for the next season.

Bonsai Soil Mix:

- Most bonsai will grow in just about any type of soil mix for a short time, but in the long term not as well as that soil they grow in nature.
- Bonsai are grown to achieve age, beauty and value, so try to simulate the soil they naturally grow in nature. Bonsai mix can be graded into four types, general purpose, sandy for Acacias and alike, composty for Maples, Azaleas and alike plus stony for Pines and re-potting mature bonsai.
- A general purpose bonsai mix is detailed in the book “Growing Bonsai in South Africa” by D. Hall and J Haw.
- Aggregate i.e. sharp crushed stone and river sand must be included in the bonsai mix for drainage and to develop fine feeder roots.
- Stone or pebbles are not placed in the bottom of the pot for drainage anymore. Aggregate is now included in the soil mix to give more room for soil. Also screens and hooks are placed over the drainage holes not stones.
- South Africa’s natural “Peat Moss” reserves are depleted so peat is imported in various types and qualities. It is a very important ingredient in any bonsai soil mix as it improves the soil structure, keeps it friable, retains moisture when the soil is dry yet prevents excess water when wet. It store’s nutrients although it is not a fertilizer, but makes the soil acidic.
- Dehydrated coco and coir peat is imported, but they are not ideal for bonsai as they need to be decomposed first. However a genuine black peat blend is also imported which is ideal.

Where to keep and display:

- Being an art form bonsai should be displayed at eye level at about waist height in sight, but kept off the ground.
- Displayed on the ground or on a brick they will probable be knocked over or the dog will have a go at them and the insects will find a home in their pots.
- The tree or shrub your bonsai is created from has no problem with the direct sunlight, as that’s where it grows naturally, but the ceramic pot will absorb heat and has a limited water holding capacity To clarify, should you walk bare footed on your driveway in mid summer you will burn your feet, as would the ceramic pot get like a “Hot potato”, scorching the roots of your tree. The water in the pot would also evaporate quickly.
- However, as an explanation, should you dig a hole in your driveway and place a small bonsai in it, cover the pot with soil to absorb the heat then water it four or more times a day. Next year it would be a large plant with it’s roots growing over and out of the pot.

Outdoor Bonsai:

- Bonsai are best kept under 40% to 60% shade netting, under evergreen tree or sheltered by a wall or structure which gives shade, or on the patio out of the direct sun between 10h00 and 15h00, however do watch out for the harsh autumn western sunlight after 15h00.
- Large bonsai with a full leaf canopy shading the pot can stand in the direct sunlight all day.
- Frost tender bonsai must be protected from the winter frost and sheltered from cold biting winds or hot draughts in summer. See suggestions for winter protection.
- Shade loving bonsai e.g. Maples, Azaleas etc. must be kept out of the direct sunlight, mainly from midday onwards.

Indoor Bonsai:

- Bonsai are not mushrooms that grow in the dark, they require the Ultra violet rays from the sun for photosynthesis, fresh air and a bit of humidity.
- Certain plants are more adaptable to indoor conditions than most. Refer to list on page
- Bonsai indoors must be kept in a north facing room or 45% off to the west or east.
- At least 2 hours of the UV sunlight is required indoors, that which you can feel on your skin. The sunlight that gives you sunburn is the sun bonsai need for photosynthesis.
- Regular foliage misting with water is required to discourage pests, especially red spider mite.
- Less water is required than for outdoor bonsai so watch out for root rot.

- Green moss on indoor bonsai may turn brown and or die due to insufficient UV light.
- Indoors they survive for the first to second year then by the third year on, they become leggy, anaemic looking with leaf internodes intervals and leaf size increasing, thereafter they die.

Pots Including Bonsai Sizes:

First of all, let's look at the sizes that bonsai come in and are classified Internationally as:

A large tree in the ground may resemble a bonsai in style, shape, and character, but technically it isn't a bonsai at all as it is not in a pot. The Japanese call it a *niwa-gi*, regardless of size.

The largest normal sized bonsai in a pot is called an *imperial bonsai*, measuring between 1.5 m to 3 meters high. This size or larger is referred to as an eight-handed bonsai, implying that four people are required to move it about. When we visited Tokyo city Japan, we saw four men moving a large bonsai using two bamboo poles with slings over them and under the pot..

Large bonsai (garden bonsai) less than 1.5 meters high are classified as *hachi-uye*. They are referred as four to eight-handed bonsai in terms of their weight. Most large bonsai are considered *dao* bonsai, or *omono* bonsai. They range between 75 cm and 125 cm in height. Two or three men can carry them.

Two-handed bonsai is the size normally seen at bonsai shows. They range from 40 cm to 100 cm high and are called *chiu* bonsai, or *chumono* bonsai.

Medium-size bonsai are known as *katade-mochi* bonsai, sometimes spelled as *kotate* or *kotade*, They can be carried in one hand and are the most popular size, accounting for the greatest number of bonsai of any classification size between 25 cm and 50cm high.

The small, or *komono*, bonsai can be easily picked up and carried in one hand, between 15 cm and 25 cm high. They are easily grasped in the hand constituting the largest of the miniature bonsai.

Mame bonsai are known as pocket bonsai, or palm bonsai, several can fit in the palm of a hand, usually less than 15 cm high but more than 5 cm high. The *shohin* bonsai is somewhat smaller *Shito* bonsai, or *keshitubo* bonsai, are smallest of all. Their maximum size is around 5 cm high, and includes any size smaller that's horticulturally possible to maintain. We call them Acorn and Thimble bonsai. These sizes test the growing skills of the bonsai enthusiast. From my experience they do not survive in South Africa unless a succulent is used. However in the northern hemisphere they are successful.

From the above it will be beneficial to create a table listing the sizes grouped down from large, medium to miniature bonsai. Their names are listed below then alongside their hand size followed by their height in meters. This table is titled: Bonsai Size Classifications.

Bonsai Size Classifications *

Large Bonsai	To pick-up	Height
Imperial bonsai	eight handed	150 to 200 cm
<i>Hachi-uye</i> bonsai	six-handed	100 to 150 cm
<i>Dai</i> bonsai	four-handed	75 to 125 cm
<i>Omono</i> bonsai	four-handed	75 to 125 cm
Medium Bonsai		
<i>Chiu</i> bonsai	two-handed	40 to 90 cm
<i>Chumono</i> bonsai	two-handed	40 to 90 cm
<i>Katade-mochi</i> bonsai	one-handed	25 to 45 cm
Miniature Bonsai		
<i>Komono</i> bonsai	one-handed	15 to 25 cm
<i>Mame</i> bonsai	one-handed	15 to 20 cm
<i>Shohin</i> bonsai	palm-size	5 to 15 cm
<i>Shito</i> bonsai	acorn-size	5 to 10 cm
<i>Keshituboa</i> bonsai	thimble-size	2.5 to 7.5 cm

* Acknowledgement: Herb L. Gustafson

Now let's look at bonsai pots. The pot size would have to match with the size of the bonsai planted in it.

Pot sizes range from thimble size to sometimes two and a half meters in length. Shapes, sizes and colours are too numerous to describe.

However, as a rule of thumb for most styles and bonsai plant species proportions are as follows:

For commercial (young) bonsai, your pot should be about half the size of the bonsai crown (volumetric size).

For professional (old) bonsai the pot should be about a quarter of the size of the bonsai crown. This proportion applies for both bonsai types following potting or by at least next season's growth.

Understanding this is a guide, the Japanese have a full range of proportions, i.e. the pot depth should not be more than one and a half times the diameter of the trunk and so on.

Bonsai with a feminine characteristic i.e. fine leaves, soft branch structure, flowering etc use feminine looking pots. Normally oval shapes, fancy and light in structure.

For masculine character bonsai pots used are normally rectangular in shape with sharp corners and heavy in structure. These bonsai have thick trunks, heavy branch structure, thorns etc.

Obviously cascade and special bonsai styles match pots accordingly. Refer to Charles Ceronio's book "Bonsai Styles of the World"

Pot colours! That's a difficult one, but in general a contrast to the colour of the bonsai foliage colour will do. Glazed or unglazed, that is your choice. Pots must have feet or be raised so that the bonsai can breath through the hole in the bottom of the pot. The drain hole or more holes according to the size of the pot must be at least 12 mm dia. each in size.

Obviously smaller to thimble size pots would have proportionally smaller holes.

When to pot and re-pot in the southern hemisphere.

The start of spring is best or just as buds appear but before the leaves unfurl, both for deciduous and evergreen trees, perennial shrubs. Evergreens can also be done in autumn on the appearance of lighter green new needle foliage.

Potting and re-potting can also be done in mid-summer, but with know-how and care, subject to how much of the root ball is disturbed.

Ficus (Figs) can be done just about anytime of the year, depending on where you stay in South Africa (cold or subtropical climates.) but avoid June to August if possible. A good guide is the Potting and Re-potting Time Table and introduction on how to Create Your Own Bonsai which will be found in our book "Growing Bonsai in South Africa"

The use of anti- stress products, will drastically help with potting stress, leaf loss and death. Using sugar water and vitamin B or disprin as a cheap anti-stress remedy is sometimes effective.

How to pot or re-pot a bonsai, is covered in our afore mentioned book.

Styling:

MAINTENANCE PRUNING is regularly done on already styled bonsai i.e. as you walk past viewing your bonsai, cut or nip off any long and or obtrusive growth (long shoots), thus maintaining its original style. However allow it to gradually grow in size leaving the shorter shoots. Remove unwanted growth on the trunk and the base of the branches.

CONCEPTUAL STYLING is done on your bonsai before you pot it, or remove the plant from its existing container, be it from a plastic bag or training pot.

In this case you need, in your minds eye, a (vision) conceptual style of what you want to create. Use that style you last saw and wish to create, or one of those stunning international styles given in the book "Growing Bonsai in South Africa" or Charles Ceronio's book "Bonsai Styles of the World".

CORRECTIVE STYLING.. This you do to correct or improve your original style or possibly, you see that should you modify the original style you could get a better new style.

REFINING THE STYLE .Refining that conceptual style to get that last touch of perfection.

Although your finished style might not conform to all the styling rules, what is important is that it is aesthetically pleasing, artistic and balanced, not only to yourself but others.

One important thing you must realize is that when cutting or nipping off those growth ends (apical meristems) on deciduous trees, you are removing next years potential flower and fruit buds.

However, plants that bud along the length of the branch and perennial shrubs that flower several times a year, this does not apply. Special techniques are used to avoid this loss.

Know how and expertise in styling is only achieved through many years of hands on work and experience. Your best bet is to join a Bonsai Kai (Club).

Root Pruning:

As with styling, root pruning techniques are varied, requiring training and experience. For the novice root pruning of commercial (small young) bonsai is simple! Basically, remove about a third of the root ball from the sides and bottom, cutting mainly the larger roots leaving as many of the fine feeder roots.

Never cut the roots off too close to the trunk or the tap root if there are no fine roots. If you cut the tap root off on most Acacias there is a fifty percent chance it will die. Rather de bark the root where you want to cut it off next season. The root will have dried up by then and can be cut off with no harm.

Bonsai Tools:

Here again the type of tools and their use are given in our afore mentioned book. However for you to start off with all you require is a cheap bonsai shear, one with a long thin blade, not a broad rose pruning secateur. A nice root pick or a piece of galvanised wire bent with a hook to clean out the soil from the root ball.. Then a branch cutter (concave cutter) for cutting off larger branches at 45⁰ leaving a concave recess cut . This aids in allowing the cambium (bark) to grow over and close. O yes! the most important is a chopstick to work down the soil on potting, removing old leaves, landscape weeding and many more tasks.

Pests and diseases:

In most cases those pests and diseases you find in your garden are the same ones you find on your bonsai.

On observation of an infestation, identify the insect or disease or take a sample to your nearest nursery for identification and advise, Treat with the appropriate insecticide or fungicide strictly as per instructions

This is the conclusion of “Bonsai in a Nut Shell”. Hope you have found it helpful and no longer have to say “I had a Bonsai but it died”. Should you still have any unexplained aspects, please e-mail us.

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