



Introduction to

Repotting Bonsai

Blue Ridge Bonsai Society 2023



We Will Cover ...

- Why repot?
- How often to repot
- The purpose of root pruning
- When to repot
- Choosing a bonsai pot
- What bonsai soil should I use?
- Tools needed for repotting
- Repotting step by step
- Tree care after repotting

Why Do We Repot?



- Because bonsai grow in a small volume of soil the tree will, in time, fill its pot with roots. A pot bound tree will in time stop growing and eventually die. Re-potting is done for the long term health and well-being of the bonsai.
- Re-potting does not 'stunt' the tree in any way, in fact the opposite is true. A healthy tree that is re-potted properly will grow much more than in previous years if it was pot bound.

Why Do We Repot?

- Creating a small, dynamic and strong root system requires access to water AND air.
- Soil's basic structure includes a maze of air filled voids between the soil particles. These are the spaces that plants exploit and fill with roots.
- As the capacity of soil in a pot to hold air begins to fall roots find it harder to grow because of the reducing air flow. In time the soil will begin to retain more moisture further reducing the air available to the roots and this will begin to reduce the vigor of the tree. Left unchecked for long enough the tree will stop growing altogether and later still will die.

How Often Should I Repot?

- As a rule of thumb, an established tree will need repotting once every two years. However, this can vary depending on various factors
 - A fast growing tree like Chinese elm growing in a small pot may need re-potting every year. The same tree in a large pot may go two or even three years before requiring attention.
 - A slow growing tree like pine or yew could manage 3-6 years in a pot and a very old mature slow growing specimen bonsai could quite happily go 10 years or more without attention.
- As a general rule the more open and free draining the soil the faster and coarser the trees growth will be. Thus, the tendency to leave mature bonsai longer between re-pots.

How Often Should I Repot?

- Look for the following clues:
- Hard, Compact Soil: When water begins to take more time to pass through the soil, it's likely your tree's roots have compacted.
- Runaway roots: If you notice roots crawling through the drainage hole or creeping across the surface soil, they've run out of space and are in need of a trim.
- Root binding: If the roots are beginning to wrap around the inside of the pot, your tree is becoming root-bound.

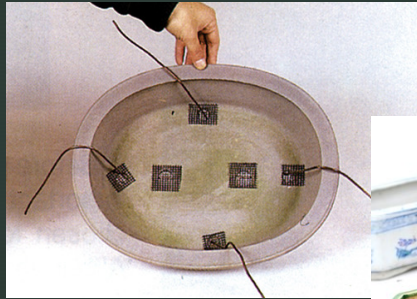


The Role of Root Pruning

- The primary function of the root is to make contact with 'soil water' and move that water into the plant. This is achieved by way of microscopic root hairs which can number 200-400 per square millimeter. Roots feeding the tree are rarely more than a couple of weeks old.
- Root pruning combats the problem of ever extending roots. Once pruned properly and returned to the soil a tree develops new feeder roots from the cut ends of the older, woody roots and as a result the tree is much stronger than before.
- One aspect of root growth that will eventually slow the growth of a tree is that by constantly moving outwards, the root tips and feeder roots eventually hit the inside of the pot and begin to grow in a circular pattern, getting progressively further from the tree body, making it more difficult to move water and nutrients into it.

When Should I Repot?

- As a general rule, the safest time to re-pot a bonsai is at bud-burst
- During the winter, bonsai are dormant and the tree "rests" until spring. During the growing season, severe root pruning and transplanting can be quite stressful to the tree. Pruning bonsai trees roots should be done just before the growing season begins because that is when cut root ends will begin to repair themselves. Pruning roots too early in dormancy means the roots will remain unhealed and open, and therefore susceptible to root rot and diseases.
- Suggested timetable:
 - Deciduous trees: February – March
 - Conifers/Evergreens: March – April (and September for many species)
 - Tropicals: April – June (mid-summer for *Ficus sp.*)



Choosing a Bonsai Pot

- A bonsai pot needs a large drainage hole(s) covered by mesh screen and additional (usually smaller) holes for wiring
- A few very general guidelines ...
 - Use glazed pots for deciduous trees and unglazed for conifers
 - The width of the pot should be approx' two thirds the height of the tree
 - The depth of the pot should be one or two times the diameter of the trunk
- But small pots slow growth rate, so ... Larger pots are often used for new or young tree material to promote growth
 - A larger pot will also mean higher water retention

What Bonsai Soil Should I Use?

- Bonsai soil should provide good water retention, drainage, and aeration
- Soil mixes are described as being either organic or inorganic.
 - Inorganic soil components contain volcanic lava, pumice, and baked/fired clays such as akadama
 - Organic soil mixes also include dead plant matter such as pine bark or peat along with inorganic elements
- Either can be used successfully
 - Many club members use inorganic soil mixes
 - The NC Arboretum uses a soil mix that includes organic components
- Organic soil components can have higher water retention, but can break down and reduce drainage over time
- Inorganic soil mixes absorb fewer nutrients and water but are great for drainage and aeration
- *NOTE: Be sure to pre-sift all soil components to remove fine particles that will impair drainage*



Inorganic Bonsai Soil Mix

- Inorganic components include:
 - Akadama This clay from Japan is the primary component used to hold water. It is mined, then fired, creating a hard material that slowly breaks down over the life of the soil
 - Lava rock Its porous nature provides water retention. Its rough, jagged surfaces also help develop fine feeder roots
 - Pumice Light-weight and porous, it retains some amount of water, but is very hard and should not break down, so contributes to good drainage
- Mixes
 - Conifers 1 akadama :1 lava : 1pumice
 - Deciduous 2 akadama :1 lava : 1pumice

Organic Bonsai Soil Mix

- Example of an organic bonsai soil mix (used at TNCA)
 - Stalite-PermaTill An expanded slate product providing drainage
 - Composted pine bark and peat Provide water retention
- Mix
 - Mix pine bark and peat 5:1
 - Mix PermaTill and bark/peat combo 1:1
 - + lime to increase pH, and micronutrient blend (e.g. *Micromax*)



What Tools Will I Need?

- Wire cutter to remove old wire holding the tree in its pot
- Chopstick to loosen old soil and help pack in new soil
- Scissors for root pruning
- Plastic mesh to cover drainage holes in the pot
- Aluminum wire (e.g. 2 mm) to secure tree after repotting
- Pliers to twist securing wire
- Also helpful ...
 - Knife or sickle to help free the tree from its pot
 - Root rake to comb out roots

Repotting Steps



- Cut and remove wires that are securing the tree in the pot
- Run a blade around the inside perimeter of the pot to loosen
- Carefully remove the tree and inspect the root mass
 - Does it need to be repotted?



Repotting Steps (continued)

- Prepare the new pot
 - Cover drainage holes with mesh
 - Insert wires through holes in the pot bottom to secure the tree
 - Add thin drainage layer of coarse material (e.g. pumice) at bottom of pot (optional)
 - Add mound of new soil where tree will be replaced into the pot





Repotting Steps (continued)

- Gently rake out the roots with a root rake and/or chopstick, starting at the top and sides, proceeding to the bottom/underside
- Reduce the root mass (root prune)
 - The objective is to maintain a radial shape while removing no more than 25-30% of the existing root system. Cut away large roots as well as any that are growing haphazardly
 - Over the course of several re-pots it is necessary to remove all of the old soil, otherwise the core of the root ball will become solid and the trees health will suffer.
 - For conifers in particular it is also important to carry over some soil each time because it contains beneficial mycorrhizal fungi that grow in association with the root hairs
 - To minimize stress, spritz roots occasionally with water to keep the root ball moist while you root prune





Repotting Steps (continued)

- Test the fit -- Once you've cleaned and trimmed the roots, hold the bonsai inside the pot to ensure that the roots do not touch the pot's edges
- Replace tree on mound of new soil, positioning it as desired including its final height
- Secure tree in pot with wires from the underside
 - Use pliers to pull and twist the wires over the root ball
- Add additional new soil around the tree in batches, wiggling the chopstick as you go to fill in air pockets; fill to within ~1/2 inch of the top of the pot

Repotting Steps (continued)

- Thoroughly water the tree e.g. set into a tub of water for 20 min or gently water a couple of times from above
- A thin layer of coarsely-screened sphagnum moss can be placed on top of the new soil to help keep the soil in place during watering.



Care After Repotting

- A newly repotted tree will be vulnerable until it is established in its new home.
- Place it tree in a sheltered spot for the next few weeks, away from strong wind
- Filtered sun is good
- Manage its water carefully. Aim to keep damp, but not wet. Newly re-potted trees take up less water than before their root-prune, and the new soil mix will almost always hold more moisture than the old mix.
- *Now, on to the next tree!*

Useful Links

- General repotting guides

- <https://www.kaizenbonsai.com/bonsai-tree-care-information/graham-s-guide-to-repotting-bonsai>
- <https://www.bonsaisocietyvictoria.com.au/resources/2020/8/27/guide-to-repotting> *(note: from Australia, so season adjust the guidance)*
- <https://www.bonsaioutlet.com/bonsai-tree-repotting-guide-step-by-step/>

- Repotting videos

- <https://www.youtube.com/watch?v=D-NQxXMY9VE&t=129s>
- <https://www.youtube.com/watch?v=6Wut6nB6Svw>
- <https://www.youtube.com/watch?v=WyMJtCfTi9g>

- Bonsai soil

- <https://www.basicbonsai.com/bonsai-soil/>
- <https://www.bonsaiempire.com/basics/bonsai-care/bonsai-soil>

- How to secure the tree in the pot

- <https://bonsaitonight.com/2016/12/27/secure-bonsai-pot/>