

PROPAGATION: Seeds, Cuttings & Layering

Dan Trzepacz - 3/20/02

STRATIFICATION OF SEEDS:

This is the type of seeds that must go through a period of 33° - 40° temperature range for a period of time. Place the seeds in MOIST (NOT WET) peat moss and place in a plastic bag. This could be put in the butter section of refrigerator. This will simulate the winter prep period that these seeds must go through before they sprout in spring (Vernalization). All fruit trees follow this procedure.

Elms, maples, citrus fruit tree seeds don't require stratification. You can just keep them anywhere, then plant in Spring.

Oily seeds must be planted immediately before oil dries out.

When you plant seeds, plant them in MOIST, NOT WET, sterile media. Then cover with plastic to keep moist. A warm mat under seed trays will help to promote germination.

Seeds, because pollination is difficult to control, generally don't produce identical trees to the parent plant.

CUTTINGS:

Cuttings produce plants that are identical to the parent plant. There are three types of cuttings: **Softwood, Semi-Hardwood & Hardwood Cuttings.**

Cuttings, unlike seedlings, do not produce tap roots. They produce lateral shoots all around the stem - so long as you make a square cut perpendicular to the stem.



SOFTWOOD CUTTINGS

There is a small window within which to take Softwood cuttings. They should be taken very early in the Spring, just after leaves fully open, but before wood hardens. This is a good technique for most varieties of Japanese Maples. The cutting should be about 3"-5" long Ideally, cut off immediately below fourth set of leaves. Then remove lower two sets, leaving top two sets of leaves.



Remove lower two sets of leaves.
Note square cut at bottom of stem.

Then plant the stem 1" deep and STRAIGHT up vertically into the following:

1/2" Sharp Filter Sand
2" 50% Peat / 50% Sharp Filter Sand
3" Peat

Before placing cutting in medium, dip in Rooting Powder or liquid Dyna Grow KLN rooting liquid. Then cover tray with plastic to keep leaves from drying out.

SEMI-HARDWOOD CUTTINGS

These cuttings are taken later in summer for such trees as azaleas, larch, spruce, hemlock and cotoneaster.

HARDWOOD CUTTINGS

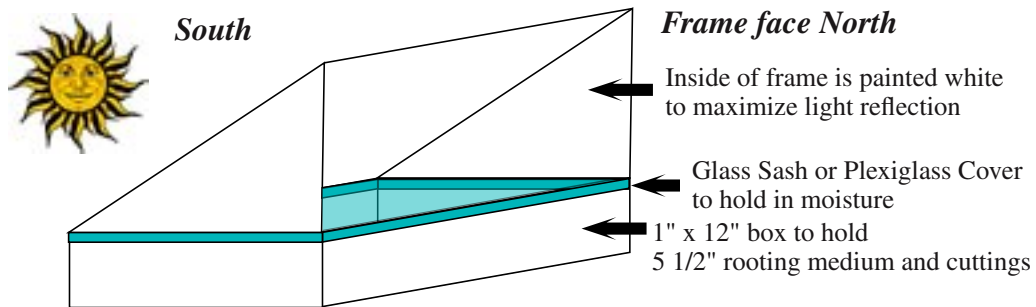
Hardwood cuttings take a lot longer to root, but they don't die off as easily as the softer cuttings do. Cuttings are taken in Fall (October/November), once wood is hard. Good for trees such as Willow and Wisteria. Cuttings can be from 4" to 30" long and from 1/4" to 2" in diameter. The cutting should not have any branches on it. A 2" diameter trunk could have a few small branches on it. Once taken, the cuttings must be **kept in a temperature environment that is less than 40°**. They can even drop below freezing. Thus the garage would be an ideal place to store the cuttings over the winter. Once you cut the piece from the parent, place a vertical cut in the bottom of the stem and place a small pebble into the cut to keep it open and flared out over the winter. Place the cutting in damp filter Sand over the winter. It should be completely covered.



Then, in Spring, plant the cutting like you would a softwood cutting.

MAKE SURE THE SUN DOES NOT HIT THE CUTTINGS DIRECTLY. IT WILL DRY THEM UP AND THEY WILL DIE. THEY NEED A LOT OF LIGHT - BUT NOT DIRECT SUN.

One way to achieve this end is to use a "**Nearing Frame.**" The outside of the frame should face South. The inside should be painted white and face North. This will shield the growing box from direct sunlight and reflect daylight on the cuttings.



LAYERING

There are two types of Layering: Ground Layering and Air Layering.

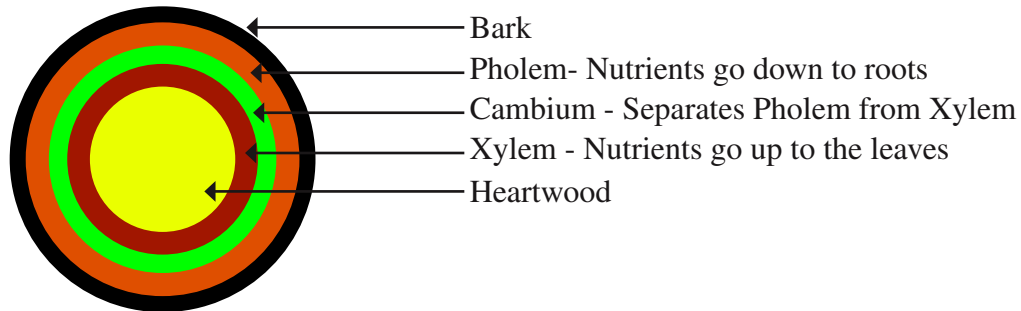
GROUND LAYERING

Take a branch from a tree and bend it down to the ground, make a cut in the branch where it will be in contact with the ground, apply some rooting powder, and cover it with dirt. This is what I did to get my Wisteria Bonsai.

AIR LAYERING

The **BEST TIME** to air layer is just after the leaves are opening, but before they fully open. You must wound the tree to get it to make roots. However, you must be careful how deep you

go. The first layer that grows each year is the XYLEM. It grows closest to the heartwood and carries nutrients from the roots to the leaves. This is the part that keeps the TOP of the tree healthy. The next outer layer is the CAMBIUM. THE CAMBIUM SEPARATES THE XYLEM FROM THE NEXT LAYER, WHICH IS CALLED THE PHOLEM. The PHOLEM layer takes nutrients from the leaves and brings them down to the roots. If there is a break in the pholem layer (i.e.. the ring of bark, PHOLEM & CAMBIUM removed in an air layer), then the "auxins" immediately seal off the OPEN WOUND so the tree doesn't bleed to death and then starts to grow roots. See below:



The trick in air layering is to remove the cambium, pholem and bark. But you must NOT damage the xylem. If you remove the xylem, the top of the air layer will die. If you don't remove all the cambium, it will callous over and produce new bark.

Most trees will root within 8 - 12 weeks. However, some will take as long as 2 - 3 years. In addition, some trees will not root in daylight. If this is the case you need to make a shade out of black plastic that covers the air layer area like a roof (don't wrap it around the air layer itself or it may absorb too much heat and dry things out.).

Refer to the chart handout (next page) that Dan provided which shows the 8 different methods of wounding the cambium. If you use method 1, the ring method, the height of the ring should be double the diameter of the trunk. Once the bark and cambium have been removed, apply rooting powder to the top edge of the remaining cambium, Then wrap the open area with MOIST - NOT Wet - Long grain sphagnum moss that has been pre-soaked in a mixture of water, Superthrive and Dyna Grow KLN rooting liquid. You then wrap the sphagnum moss with a heavy mil clear plastic. Dan uses 6 mil greenhouse clear plastic. Use copper wire to tie down the top and bottom of the wrap. If you are air layering a tree that will be in the sun, wrap the clear plastic with aluminum foil, with the shiny side out.

If the moss dries out before roots form, Dan inserts water mixed with KLN with a hypodermic needle.

Once the roots sprout, cut it from the parent by cutting it at the bottom of the ring. Then pot it, without disturbing the sphagnum moss root ball - the roots are too tender to try and remove the moss, Tie the tree to the pot so that it doesn't move and disturb the roots. Keep it in the shade for one month.

GRAFTING

Grafting is another method of propagation. It is not generally used to propagate another tree in bonsai. Instead, in bonsai, grafting is used to graft branches and roots into desired locations. Since this is an involved approach, it is too detailed to include in this topic and would require another session to treat it properly.