



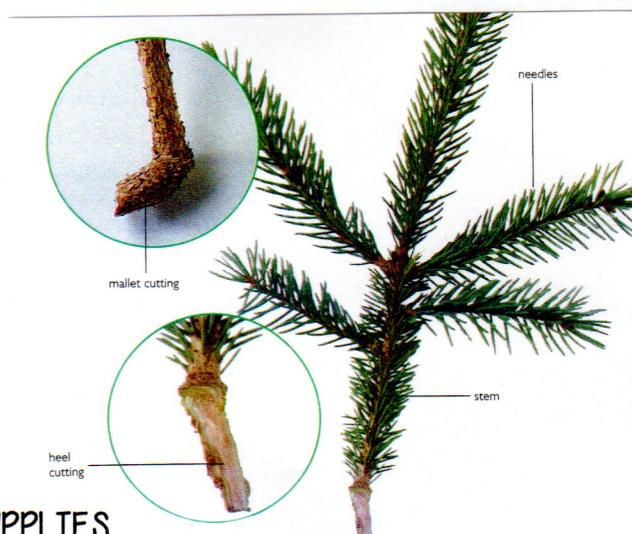
## The "LOVE in the GARDEN" Series, Part 1:

# 1 + 1 = 2: PROPAGATION of CONIFERS by CUTTINGS

## BACKGROUND

Three methods of propagation of conifers are by cuttings, seeds, and by grafting. Propagation via cuttings has two advantages: 1) They produce larger plants more quickly than seeds and more easily than grafting, and 2) the new plants are clones, having the identical genetic code of the parent plant, unlike some seed propagation. But here's the rub: Propagation by cuttings, particularly conifer cuttings, may fail, primarily because fungus can develop. And then there's the accompanying Rub #2: Experts in this field suggest that if half of our cuttings develop roots we're doing great ... NOTE TO SELF: Plant multiples! ... And as if that isn't enough, here's Rub #3: With cuttings as the propagation method, there's that constant balance of light, water and heat, a challenging combination of great importance ... but more about all this later ...

The best time to take *most* conifer cuttings is late fall to early winter; however, some more easily rooted cuttings can be taken in late summer. Some junipers present rooting challenges ... Take a mallet cutting (that includes ½-1" of the branch from which the stem grows). A heel cutting (a torn sliver of bark and some interior of the wood from which the cutting emerges) is used with most other conifers.



## SUPPLIES

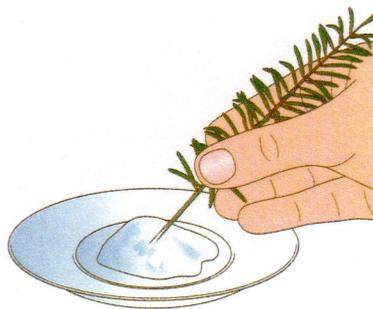
1. A 4-6" stem of a (scaled or needled) conifer w/ fresh, new growth from a middle/lower branch for best success rate
2. Latex or nitrile gloves
3. Hot soapy water, full-strength Lysol or diluted chlorine bleach to clean pruners, knife and other tools
4. Clean bypass pruning shears (An anvil pruner crushes soft tissue of the stem, stopping the flow of nutrients)
5. Peat, coir or cow pot, or a multi-flat with up to 72 cells
6. Soilless medium: (½ coarse sand [or perlite] & ½ peat moss [or coir]); if under mist, increase sand to 3:1 proportion [NOTE: I prefer peat moss, an acidic, "happy medium" for acid-loving conifer cuttings as they develop root systems.]
7. Pencil
8. Hormone rooting compound (Liquid compound can be mixed specifically for hard, semi-hard or soft woods)
9. Sharp knife
10. Clear plastic bag (Zip-loc or w/ twist-tie or clip) or tall plastic lid (painted with a white wash if under direct light)
11. Plant labels and marker
12. Seedling heat mat (or incandescent mini-Christmas lights) to provide bottom heat to 65-70 degrees
13. Container of warm water added to a drop of dish soap (if using peat moss ... explanation on pg. #3)

## PROCEDURE



### CUT

For the best chance of success cut a stem with fresh, new tip growth that is 4-6" long. Strip the bottom leaves, wounding the lower stem beneath each node (growth point), creating a *callus*.



### DIP

Use rooting compound. Dip stems in some that's been poured out of the original container & shake off excess. Throw away remaining compound.



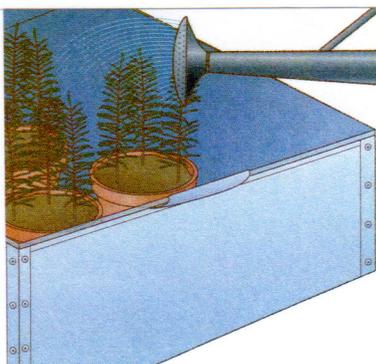
### DIBBLE

Place cutting in prepared holes in the medium. Firm the medium around the cutting and tap the pot to be sure there are no air pockets.



### LET ROOT

Place pot in a "propagating chamber" with bottom heat or in a cold frame in a protected area outdoors. If outdoors cover w/ shade cloth, burlap or white paint to provide filtered shade.



### MONITOR

Monitor cuttings all winter to be sure the medium stays moist & that temperatures remain within the preferred range - 65-70 degrees. Cuttings kept inside develop roots in a month or more. Those outside may wait till spring.



### GROW IT UP & OUT

Once indoor cuttings have roots transplant into a humus-rich soil and a larger pot. Once frost-free date has passed, move the pots outside. Monitor them closely. By the following spring your new plants will be ready to transplant into their permanent garden positions w/ a full root system.

## AND IN MORE DETAIL ...

1. Fill pot with soilless medium (recipe in the SUPPLIES section, PAGE #1), & add warm water w/ drop of dish soap, settling the medium. Dry peat moss is hydrophobic! Add warm water to a drop of dish soap that acts as an emulsifier ... a stabilizing wetting agent ... that alters the surface tension of the peat, allowing it to absorb water more easily.
2. Cut stem with fresh, new growth at the tip, 4 - 6" long, from middle/lower branches of conifer.
3. Tear needles/scales from the lower 1/2 or more of the stem, creating a callus. (Each node has a high concentration of growth hormone. Reduction of leaves reduces stress on cuttings and wounds the growth points for root development.)\*
4. Beneath a node, wound (cut) through bark to cell layer, called the cambium, on conifers w/ upright growth habit.
5. Dip in hormone rooting compound (The wood of stems & branches gets harder throughout the season. *In general*, we're now leaving the semi-hardwood stage and entering the hardwood stage. Liquid hormone rooting compound allows you to alter the amount of water added, depending on the hardness of the particular stem you're rooting.)
6. Push pencil into soilless medium; insert stem into hole; gently push medium around it, then tap pot to prevent air pockets.
7. Label the plant species & variety, along with the eventual size, preferred conditions & the day's date.
8. Put into plastic bag or "mini-greenhouse" to create warm, humid tent in bright, indirect light, from 65 - 70 degrees.
9. Pour water into soilless medium periodically, **keeping water off needles/scaled leaves** (Remove lid/bag for a short time after adding water to give your cuttings a *breather*) \*\*\*Take a look at pg. 4 for a recipe for a 9/3/16 workshop participant's brilliant suggestion to use hydrogen peroxide to avoid fungus on the leaves, pot & soil!

\* Jude Armstrong's deeper explanation of this process: Calluses in plants are the same as 'stem cells' in people; they have the capacity to become any kind of cell for that organism. The plants send auxins (what is in *Rootone*, etc.) to the callus tissue and induce root formation. Another hormone would produce other kinds of cells/structures. Thank you, Jude!

## CONIFER SUCCESS with the CUTTING METHOD

Scientific Name	Common Name	When Best to Propagate by Cutting	Difficulty ***
Abies spp.	Firs	mid- to late winter	3
Cedrus spp.	Cedars	late fall to winter	3
Chamaecyparis spp.	False Cypress, White Cedars	late summer to mid-autumn	1
Cupressocyparis Leylandi	Leyland Cypress	mid- to late summer	2
Cupressus spp.	Cypress	late winter or late summer	2
Juniperus spp.	Junipers	late summer, autumn or late winter	2
Larix spp.	Larches	mid-summer	1
Picea spp.	Spruce	mid-summer or late winter	3
Picea pungens	Blue Spruces	not recommended	4+
Pinus spp.	Pines	spring	1
Pseudotsuga menziesii	Douglas fir	mid-winter	2
Taxus spp.	Yews	autumn	2
Thuja spp.	Arborvitae	autumn	1
Tsuga spp.	Hemlocks	late fall to winter	3

\*\*\* Difficulty: 1 - Easy 😊 2 - Kinda Easy 😊 3 - There's gotta be a better way! 😞 4 - Don't try this at home! 🙅

## JUST CURIOUS ...

How should one keep good circulation to avoid fungal disease while creating humidity for development of root systems? Commercial growers utilize an *intermittent misting system*. For those of us who are more low-tech, taking the lid or bag off every day as we check to be sure the medium in the pot is moist and that the needles/scaled leaves aren't wet may be our best bet, & ....

**\*\*BIG IDEA #1:** Rooting compounds, until recently, contained a fungicide in the mix. Because of regulations concerning fungicide for edible plants this is no longer the case. During our 9/3/16 workshop I'd suggested adding fungicide to the rooting hormone; HOWEVER, a participant suggested using *hydrogen peroxide*. Here's a mixing chart I found online to either spray on leaves or pour onto the planting medium when watering: Quart of Water: 2 T. of 3% hydrogen peroxide; ½ tsp. of 35% hydrogen peroxide. Gallon of Water: ½ cup of 3% hydrogen peroxide; 2 tsp. of 35% hydrogen peroxide. It aerates the soil & acts as an anti-fungal.

**AND:** Consider Jude's suggestion to sterilize soil and pots prior to planting your cuttings: (Vetted, with the WSU Seal of Approval, and written by Laura Pottorff, horticulturist and plant pathologist from Colorado State University Cooperative Extension)

## SOIL STERILIZATION

Soil to be treated should crumble easily and be without clods or large pieces of plant debris. It must be moist, but not wet. Gently squeeze a handful of soil. When the hand is opened, the soil ball should break apart somewhat. If it doesn't and if the ball cannot be broken by gently pushing on its top, the soil is *too* wet. If the soil is too dry, add water. Add any amendments – manure, compost or peat moss – before sterilization.

## OVEN METHOD OF STERILIZATION

Spread soil not more than 4" deep in non-plastic containers, such as seed flats, clay pots and glass or metal baking pans. Cover each container tightly with aluminum foil. Insert a meat or candy thermometer through the foil into the center of the soil. Set the oven between 180 – 200 degrees F. Heat the soil to at least 180 degrees and hold at this temperature for 30 minutes. Do not allow the temperature to go above 200 degrees. (High temperatures may produce plant toxins.) After heating, cool and remove containers from the oven and leave aluminum foil in place till ready to use. The heated soil will give off an odor. 🤢

**BIG IDEA #2**, for those of us gardening with an abundance of rocks, clay or sandy soil: Experts suggest that when we dig a hole for a new planting that we add compost *only* on top of the soil rather than mix it in – even to soil inappropriate for that plant – in order to avoid growing roots eventually girdling the plant rather than venturing out into less welcoming soil. I dig a hole *almost* the depth of the plant's root ball, but instead of digging that hole the suggested 2-3 times the width of the plant, I dig it the width that plant will *eventually* become at maturity, and mix the native soil w/ compost before shoveling it around the plant, then cover the top of the root ball with mulch – ensuring 1) that the plant will be happy in its permanent garden home its entire life, and 2) that I'll remember the eventual size that plant will become as I'm digging holes for other plants around it.



STAY TUNED, SAME TIME NEXT YEAR WHEN WE'LL COVER the 'Love  in the Garden' Series, Part II:

## And the TWO Shall Become ONE: PROPAGATION OF CONIFERS BY GRAFTING

## REFERENCES

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8. <http://www.mikesbackyardnursery.com>