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Propagating Ornamental Trees and Shrubs

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Commercial propagators have elaborate facilities for propagating trees and shrubs grown as ornamentals. These are necessary where the propagator must have a high percentage of success if he is to make a living.

The home gardener and hobbyist can, however, do a tolerable job of propagating trees and shrubs with little or no equipment. The processes of rooting, graft union formation or seed germination might not be as successful as in commercial facilities, but usually the hobbyist will only want a few plants of each kind.

The rooting hormones can be purchased at garden stores or a local nurseryman may have special concentrations if needed. Bottom heat can be supplied by an inexpensive heating cable. Small plastic shelters set up in a shady part of the garden can substitute for the greenhouse environment. For summer or softwood cuttings, a lathhouse or even a shady spot will suffice. Mist may be applied by hand 3 or 4 times a day to keep the cuttings turgid and cool.

Seeds may be collected and then stratified in a home refrigerator, or they may be fall-planted to satisfy their cold requirement. Young seedlings may be shaded with lath or snow fencing for the first few weeks.

The publication summarizes methods of propagating — by seed or by some form of asexual propagation

— the trees and shrubs most commonly grown as ornamentals. The serious hobbyist can find more complete information in a number of good plant propagation books.

Definitions

Here are definitions of some terms used in plant propagation:

Stratification — moist treatment of the seed, usually at 40°F (4°C) but sometimes also at warmer temperatures or with concentrated sulfuric acid.

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Hardwood cuttings — cuttings taken during the dormant season.

Softwood cuttings — cuttings made from growing shoots.

IBA — indole butyric acid, a plant hormone used to induce rooting. It is usually formulated at various concentrations in talc. It may also be used as a liquid quick dip (concentrated) or soak (dilute) treatment.

Bottom heat — heating of the rooting media usually with electric cables.

Ornamental Trees and Shrubs

Genus (Common name)	Propagation
Abies (Fir)	Seed — Use fresh seed. Stratify 1 to 3 months at 40°F (4°C) or plant in the fall. Cuttings — Take in winter. Treat with .4% or .8% IBA. Use bottom heat. Graft — Side-graft onto seedling of same species.
Acer (Maple)	Seed — Stratify at 40°F (4°C) for 90 days or fall-plant. For spring seeds (<i>A. rubrum</i> and <i>A. saccharinum</i>), plant seed when

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	ripe. <i>A. palmatum</i> seed will germinate after being soaked overnight in hot water. <i>A. circinatum</i> requires an extended stratification period. Cuttings — Summer cuttings of <i>A. ginnala</i> and <i>A. palmatum</i> root readily when treated with .3% IBA. Use mist and bottom heat. Overwinter cuttings in a greenhouse or frame.

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Genus (Common name)	Propagation
Acer (continued)	
	Grafting — Cultivars of the maples are bud-grafted onto seedlings of the same species. Grafting is done in late summer. Budded cultivars should be used in preference to seedling trees because of their uniform growth habit.
<i>Aesculus</i> (Horsechestnut, Buckeye)	Seeds — Gather seeds and stratify immediately at 40°F (4°C). Field plant in rows or grow in 2 gallon containers.
<i>Alnus</i> (Alder)	Seeds — Stratify at 40°F (4°C) for 60 to 90 days or field plant.
<i>Arctostaphylos</i> (Kinnickinnick, Bearberry)	Seed — Try stratification for 3 to 4 months at 40°F (4°C). Germination will be erratic. Cuttings — Take any time from August to March. Treat with .3% or .8% IBA. Use peat-sand, peat-perlite media and bottom heat.
<i>Artemisia</i> (Sagebrush)	Cuttings — The artemisia used for ornamentals are propagated by cuttings which root easily when placed in a well-drained but moist media.
<i>Aucuba</i> (Gold Dust)	Cuttings — Summer or fall cuttings root easily. Use .3% IBA and bottom heat.
<i>Berberis</i> (Barberry)	Seed — Stratify 60 days at 40°F (4°C) or fall plant. Cuttings — Root leafy cuttings under mist in mid-summer. Use .3% IBA and bottom heat.
<i>Betula</i> (Birch)	Seed — Stratify 60 to 90 days at 40°F (4°C) or fall plant. <i>B. papyrifera</i> should be frozen 4 to 6 weeks and then planted. Graft — Cultivars of birch, primarily <i>B. pendula</i> , are bud-grafted onto rootstocks of the same species.
<i>Buxus</i> (Boxwood)	Cuttings — Make cuttings in fall. Treat with .3% IBA and use bottom heat. Softwood cuttings may also be rooted under mist.
<i>Calluna</i> (Heather)	Cuttings — Summer in greenhouse (also in fall). Treat with .3% IBA or soak 24 hours in 50 ppm IBA. Root in peat-sand media. Bottom heat may help.
<i>Caragana</i> (Siberian Pea)	Seed — Soak seeds and sow in field or stratify 60 to 90 days at 40°F (4°C).
<i>Castanea</i> (Chestnut)	Seed — Stratify immediately after harvest, 3 months at 40°F (4°C). Grafting — Cultivars of Chinese chestnut are budded or grafted onto <i>C. mollissima</i> rootstocks.
<i>Catalpa</i> (Catalpa)	Seed — Require no treatment. Store cool and dry overwinter. Plant in rows in spring.
<i>Ceanothus</i> (Buckbrush, Red Twig, Ceanothus)	Seed — Place seed in hot water and let sit for 24 hours. Sow in beds. Stratification at 40°F (4°C) may be necessary for <i>C. sanguinea</i> .
<i>Celtis</i> (Hackberry)	Seed — Soak seeds 10 to 30 minutes in concentrated sulfuric acid and plant into beds (fall) or stratify at 40°F (4°C) for 3 to 4 months for spring planting.
<i>Chaenomeles</i> (Flowering Quince)	Cuttings — Although seed are easy to germinate, cultivars are maintained by cuttings. Early summer cuttings root readily

Genus (Common name)	Propagation
	when treated with 15 to 25 ppm IBA for 24 hours and placed in the greenhouse under mist. Root cuttings can be taken in the fall and stored at 40°F (4°C) overwinter. They are lined out in the field or potted in the spring.
<i>Chamaecyparis</i> (False Cypress)	Cuttings — Cultivars of <i>C. lawsoniana</i> are hardy in most of Idaho. Cuttings root if treated with .3% IBA and benched from August to February. Bottom heat aids rooting. Cuttings placed in a cold frame in fall will root readily the following spring.
<i>Clematis</i> (Clematis)	Cuttings — The popular clematis vines are propagated by cuttings, usually taken from greenhouse stock plants. Treat with .3% IBA, or quick dip in 2000 to 4000 ppm, or soak in 25 to 50 ppm for 12 to 24 hours. Use mist and bottom heat.
<i>Cornus</i> (Dogwood)	Seed — Harvest berries when ripe, extract seed and stratify immediately. If seed is dry, as from commercial sources, soak 24 hours before stratifying. Stratify at 40°F (4°C) for 4 months. Cuttings — Softwood or hardwood cuttings of <i>C. stolonifera</i> , <i>C. alba</i> root readily. Treat softwood cuttings with .2% IBA and root under mist. Hardwood cuttings may be taken in February or March, treated with .3% IBA and rooted on a bench with bottom heat. Grafting — <i>C. florida</i> is grafted onto seedlings.
<i>Cotinus</i> (Smoketree)	Cuttings — To propagate pistillate plant used as ornamentals, softwood cuttings are taken in early summer. Treat with .3% IBA and root in greenhouse under mist.
<i>Cotoneaster</i> (Cotoneaster)	This group of ornamentals is variable in propagation. Seed propagation is generally unsatisfactory. <i>C. horizontalis</i> can be grown from seed. Scarify in sulfuric acid for 1 to 1½ hours and stratify at 40°F (4°C) for 4 months. Other species are best propagated by cuttings. <i>C. dammeri</i> roots easily as either softwood or hardwood cuttings. <i>C. apiculatus</i> and <i>C. microphylla</i> can be rooted as softwood cuttings in August. Use .5% IBA.
<i>Crataegus</i> (Hawthorn)	Seed — Complicated seed dormancy. Stratify warm 70°F (20°C) for 3 to 4 months, then 40°F (4°C) 3 to 4 months, or scarify with sulfuric acid 15 to 20 minutes and then stratify at 40°F (4°C). Grafting — Cultivars of <i>C. laevigata</i> (<i>C. oxyacantha</i>) are grafted onto seedlings.
<i>Cytisus</i> (Scotch Broom)	Cuttings — Can be rooted most any time of the year, best in August to December. Treat with .3% IBA and give bottom heat.
<i>Daphne</i> (Rock Daphne)	Cuttings — Leafy cuttings in June and July. Root in peat-sand media. Treat with .3% or .8% IBA. Use bottom heat and mist.
<i>Deutzia</i> (Deutzia)	Cuttings — Both softwood and hardwood cuttings root easily. IBA treatment may be helpful. Mist softwood cuttings in the greenhouse.
<i>Elaeagnus</i> (Russian Olive,	Seed — Stratify 3 to 4 months at 40°F (4°C).

Genus (Common name)	Propagation
Silverberry, Autumn Olive)	Cuttings — Softwood or hardwood can be rooted. Softwood taken in early summer and rooted under mist does best.
Erica (Heath)	See Calluna.
Euonymus (Burning Bush, Winter Creeper, Spindle Tree)	Cuttings — Root deciduous kinds from softwood cuttings; evergreen kinds any time. Root easily.
Fagus (Beech)	Seed — Do not allow to dry. Stratify at 40° F (4° C) for 3 to 4 months. Grafting — Most ornamental beech are bud grafted onto seedlings of <i>F. sylvatica</i> .
Forsythia (Forsythia)	Cuttings — Root softwood cuttings June-August. Treat with .3% IBA using mist and bottom heat. Hardwood cuttings can be rooted in February in the greenhouse or stored and field-rooted.
Fraxinus (Ash)	Seed — Stratify 3 months at 40° F (4° C). <i>F. excelsior</i> requires a warm treatment of 3 to 4 months before stratification. Grafting — Cultivars of <i>F. pennsylvanica</i> and <i>F. excelsior</i> are grafted onto seedling rootstocks.
Genista (Broom)	See Cytisus.
Ginkgo (Ginkgo)	Cuttings — Although the Ginkgo can be propagated from seed, only the staminate trees are used in landscaping. Take softwood cuttings in summer. Root in the greenhouse under mist.
Gleditsia (Honey locust)	Seeds — Scarify 1 to 2 hours in sulfuric acid and then stratify at 40° F (4° C) for 3 months. Cuttings — Softwood cuttings in summer or hardwood cuttings taken in late winter can be rooted.
Hydrangea (Hydrangea)	Cuttings — Softwood in early summer. Root under mist. Treat with .3% IBA. Hardwood in late winter will usually root.
Hypericum (St. Johnswort)	Cuttings — Root softwood cuttings in early summer in greenhouse.
Juniperus (Junipers)	Seed — Germination is erratic. Seeds usually germinate over a 2-year period. Treat seed with sulfuric acid for 30 minutes. Then stratify for 4 months at 40° F (4° C) or fall-plant. Cuttings — Most of the spreading junipers can be propagated by cuttings. For <i>J. chinensis</i> , <i>J. sabina</i> , <i>J. communis</i> , use .8% IBA powder or 4000 to 8000 ppm quick dip. For <i>J. horizontalis</i> , a .3% powder will suffice. For <i>J. scopulorum</i> , <i>J. virginiana</i> , use .8% IBA and wound cuttings. Cuttings may be made from July to February. Root in sand or sand-peat media with bottom heat. Mist is not necessary. Grafting — Veneer or side graft to seedlings of <i>J. scopulorum</i> , <i>J. virginiana</i> or <i>J. chinensis</i> . Rootstocks should be brought into the greenhouse in December or January and forced into growth. After grafting, sink pots into moist peat and cover bench with glass or plastic. Occasional misting is helpful.

Genus (Common name)	Propagation
Larix (Larch)	Seed — Fall plant or stratify at 40° F (4° C) for a month. Cuttings — Root young tips in early summer. Use .8% IBA and mist.
Ligustrum (Privet)	Cuttings — Root softwood or hardwood cuttings. Hardwood cuttings taken in late winter will root in the greenhouse or can be field rooted.
Lonicera (Honeysuckle)	Cuttings — Most root easily from hardwood cuttings taken in late winter. Use a .1% or .3% IBA powder to speed rooting.
Mahonia (Oregon grape)	Seed — Do not dry the seeds, stratify immediately at 40° F (4° C) overwinter, plant out in spring. Cuttings — Use softwood cuttings treated with a high concentration (20,000 ppm) quick dip of IBA. Use mist.
Malus (Apple, Crabapple)	Seed — Stratify 60 to 90 days at 40° F (4° C). Watch for germination. Grafting — All cultivars of apple and crabapple are grafted to a seedling or size-controlling rootstock. Budding in late summer is a useful method. Cleft or whip graft may be used in bench-grafting or field-grafting in spring. Mound layering — Size controlling rootstocks are propagated by mound layering or stool bed. Tissue culture — Virus-free rootstocks are propagated in tissue culture.
Parthenocissus (Virginia creeper, Boston ivy)	Cuttings — Root softwood cuttings in greenhouse in summer or hardwood cuttings in spring.
Pachistima (Pachistima, Mountain lover)	Cuttings — Root softwood or hardwood cuttings. Use .3% IBA and peat-sand media.
Philadelphus (Mock orange, Syringa)	Cuttings — Root hardwood or softwood cuttings. A .1% or .3% IBA powder may help but cuttings root easily.
Picea (Spruce)	Seed — Most require 1 to 3 months of stratification at 40° F (4° C). <i>P. pungens</i> and <i>P. engelmannii</i> do not require stratification. Cuttings — Difficult to root. Dwarf Alberta spruce and nest spruce are rooted in July and August. Use an acid media and bottom heat. Grafting — Selected clones of <i>P. pungens</i> and <i>P. abies</i> are grafted onto seedling rootstocks (See Juniperus).
Pinus (Pines)	Seed — Most do not require stratification but a 1 to 3 month cold treatment may produce more uniform germination. Grafting — Ornamental cultivars are grafted onto seedling rootstocks much the same as Juniperus.
Platycladus (Oriental arborvitae)	Cuttings — Ornamental cultivars are propagated from cuttings taken from July to February. Use a .3% IBA powder and bottom heat.
Populus (Poplars, Aspen)	Seed — Not practical except for aspen which is impossible to root. Collect seed and plant immediately. Seed must never dry out. Plant in sterile soil mix and give shade.

Genus (Common name)	Propagation	Genus (Common name)	Propagation
Populus (continued)	Cuttings — Make cuttings in late winter and store at 35° F (1° C) until they can be planted in rows. Cuttings must be kept wet while rooting. Aspen can be propagated from root cuttings gathered in late winter or early spring. Place the rooted cuttings in flats of moist sphagnum or peat. New shoots will appear. These can then be rooted if desirable.	Sorbus (Mountain ash)	Seed — Stratify 3 to 4 months at 40° F (4° C). Grafting — Ornamental cultivars are bud-grafted onto appropriate seedling rootstocks.
Potentilla (Cinquefoil)	Cuttings — Ornamental cultivars are rooted from soft or hardwood cuttings. They are easy to root.	Spiraea (Spiraea)	Cuttings — Root softwood cuttings under mist in summer in a greenhouse, or hardwood cuttings in late winter. Hardwood cuttings may be field-rooted.
Prunus (Peach, Plum, Apricot, Cherry)	Seed — Seedlings are used as rootstocks. All require stratification at 40° F (4° C) for 3 to 4 months. If possible, do not allow to dry out. Store moist and warm until stratification in cold. Cuttings — Some ornamental Prunus can be rooted. Use softwood cuttings, mist, bottom heat and .3% IBA powder. Grafting — Prunus cultivars are bud-grafted in late summer onto appropriate rootstocks.	Symphoricarpos (Snowberry)	Seed — Propagation from seed is difficult. Stratify for 4 to 5 months at warm temperature and 3 to 4 months at 40° F (4° C). Cuttings — Hardwood, softwood and root cuttings are easy to root.
Pseudotsuga (Douglas fir)	Seed — Sow seed in fall or stratify at 40° F (4° C) for 2 months before planting. Grafting — Ornamental cultivars are grafted to seedling rootstocks (See Juniperus).	Syringa (Lilac)	Cuttings — Timing is of utmost importance. Take cuttings just before to just after flowering or when new shoots are 4 to 6 inches long. Place under mist in a well-drained media (sharp sand). Treat cuttings with .8% IBA powder and spray bed with fungicide to avoid fungus attacks. Use bottom heat. Grafting — Lilacs are usually grafted. A bench graft is made to an ash or privet root. The rootstock acts as a nurse root until the scion roots.
Pyrus (Pear)	Seed — Handle like Malus. Grafting — All cultivars of pear are grafted onto appropriate rootstocks. Usually budding is done in late summer.	Taxus (Yew)	Cuttings — Take cuttings early winter. Root in sand with bottom heat. Use .8% IBA or higher. Leave on bench until well rooted.
Quercus (Oak)	Seed — Store cold and moist until ready to plant. Fall planting probably best. Protect seedbed from rodents.	Thuja (Arborvitae)	Cuttings — Softwood or hardwood cuttings can be used. Treat cuttings with .4% or .8% IBA. Wounding aids in rooting. Bottom heat is beneficial.
Rhus (Sumac)	Seed — Do not allow seed to dry. Stratify warm for 3 to 5 months, then cold (40° F, 4° C) for 3 months. Offshoots — The fern leaf sumac, <i>R. typhina</i> 'dissecta' is propagated from root suckers.	Tilia (Linden)	Seed — Scarify seed first in nitric acid for 30 minutes, then in sulfuric acid for 15 minutes. Then stratify at 40° F (4° C) for 4 months, or stratify warm for 4 to 5 months and then cold for 4 to 5 months. Grafting — Ornamental cultivars of linden are bud-grafted to seedling rootstocks in late summer.
Ribes (Currants)	Cuttings — Ornamental currants are propagated by softwood cuttings taken in the summer. Use mist and .3% IBA.	Tsuga (Hemlock)	Seed — Stratify 2 to 3 months at 40° F (4° C). Cuttings — Some cultivars are propagated by cuttings. Rooting is erratic. Take cuttings in late winter or mid-summer. Treat with .8% IBA and give bottom heat. Grafting — Cultivars may be grafted similarly to spruce (see Picea).
Rosa (Rose)	Grafting — Ornamental roses are grafted to clonal rootstocks. This is a very specialized field of propagation and should be attempted on a commercial scale only after considerable experience.	Viburnum (Various)	Seed — Stratify warm 4 to 5 months or until seed has produced roots, then stratify cool 40° F (4° C) for 3 months. Cuttings — Take cuttings in mid- to late summer. Treat with .3% or .8% IBA. Use bottom heat. Leave on the bench until well rooted.
Salix (Willow)	Cuttings — The willows root very easily and can be treated like the poplars (see Populus). Grafting — Some weeping or prostrate forms of willows are budded onto stems to give a specific ornamental effect.	Vitis (Grape, Virginia Creeper, Boston Ivy)	Cuttings — Root hardwood cuttings in field. Take cuttings in late winter and store cold until planting time. Vitis species may also be rooted in the greenhouse from summer cuttings.
Sambucus (Elderberry)	Seed — Stratify 3 to 4 months at 40° F (4° C). Germination is often erratic. Cuttings — Softwood cuttings under mist root easily.		

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