

Propagation of Woody Plants From Stem Cuttings

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Woody plants may be the simplest or the most difficult of plants to propagate, depending upon the species used or the season of the year. All woody plants are perennials, and they go through an annual growth cycle as dictated by the four seasons of the year and the prevailing temperatures and day lengths. This annual growth cycle is typified by a rapid flush of vegetative growth in the spring, a slowdown of growth in the summer, an accumulation of food reserves in the fall, and a non-growing dormant period during the winter.

The tissues of woody stem cuttings differ in ease of rooting according to season and the stage of maturity of the wood at the time the cutting is taken. Accordingly, woody cuttings are classified as: Softwood, semi-hardwood, and hardwood.

Softwood cuttings

Softwood cuttings are taken in the spring or early summer from the tips of succulent stems and should snap off or cut readily because the tissues are immature. Softwood cuttings should be 3 to 5 inches long and have from $\frac{2}{3}$ to $\frac{3}{4}$ of the basal foliage removed. The amount of foliage allowed to remain is determined largely by the environmental controls available where roots are being regenerated. Mist propagation which is designed to keep a film of moisture on the leaf surface is the best propagating system to use with softwood cuttings. If mist is not available, cuttings can be retarded by shading and by increasing the humidity.

Shading is accomplished by the use of lath muslin, or saran cloth which help to maintain a lower temperature. This in turn slows down top growth of the cutting and aids in keeping a high humidity. The humidity can be increased by covering single cuttings with a glass jar or constructing a plastic-covered frame to enclose numerous cuttings. The high humidity slows down moisture loss from the leaves and prevents wilting during the time the cutting lacks a root system. As roots appear, the cover may be raised slightly to allow fresh air circulation.

Coarse sand is probably the best all-around propagating medium for general plant use. However, acid-loving plants such as azaleas, rhododendrons, and blueberries do better with equal parts of sand and peat moss.

Softwood cuttings frequently will root readily without the aid of hormones, but low concentrations of hormones are sometimes used to prevent injury to the tender tissues. When used properly, hormones will speed rooting. Bottom heat is also beneficial for this purpose.

Several types of fruit plants are now being propagated under mist by means of softwood cuttings. More common is the propagation of ornamental trees and shrubs. A partial list of these follows.

Generic name	Common name
Buddleia	Butterfly bush
Catalpa	Catalpa or Indian bean
Cercis	Red bud or Judas tree
Cornus	Dogwood
Deutzia	Deutzia
Ginkgo	Maidenhair tree
Hibiscus	Rose mallow
Hydrangea	Hydrangea
Koelerstera	Goldenrain tree
Lonicera	Honeysuckle
Parthenocissus	Virginia creeper—Boston ivy
Rhododendron	Azalea
Rhus	Sumac—Smoke bush
Sambucus	Elder
Spiraea	Spirea
Syringa	Lilac
Tamarix	Tamarix
Viburnum	Viburnum

Semi-hardwood cuttings

Semi-hardwood cuttings are taken from late spring, after the first flush of succulent growth has subsided, until early fall. At this time the stem tissues are maturing and more of the plant's manufactured foods are being stored than are being utilized for growth. Semi-hardwood stems bend without breaking or, when broken, tear rather than snap off. Such cuttings are usually cut 4 to 6 inches long and about two-thirds of the basal foliage is removed.

The same propagating facilities as used with softwood cuttings can be used with semi-hardwoods, although semi-hardwood cuttings are usually tolerant of less ideal environmental conditions. Since the tissues are mature, the cutting is less succulent and is more resistant to wilting and disease. Semi-hardwood cuttings usually respond to rooting hormones and, having greater food reserves, they have a longer life expectancy in the propagating bench.

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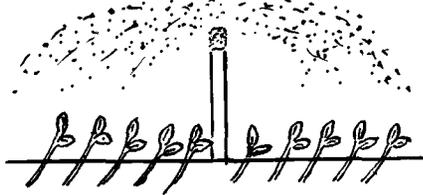


Softwood Cuttings

Spring



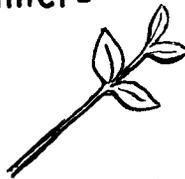
Mist, or cover + shade



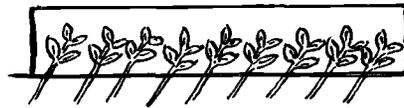
Bottom heat desirable

Semi-Hardwood Cuttings

Summer-Fall



Plastic cover + shade



Bottom heat desirable

Hardwood Cuttings

Winter



Field conditions



Many ornamental plants common in Oregon are propagated from semi-hardwood cuttings. The plants listed below can be propagated as semi-hardwood cuttings.

Generic name	Common name
Abelia	Glossy abelia
Arbutus	Strawberry tree
Aucuba	Japanese aucuba
Buxus	Boxwood
Calluna	Scotch heather
Camellia	Common camellia
Choisya	Mexican orange
Cotoneaster	Cotoneaster
Erica	Heath
Escallonia	Escallonia
Euonymus	Spindle tree
Hedera	Ivy
Iberis	Evergreen candytuft
Ilex	Holly
Juniperus	Juniper
Mahonia	Oregon grape
Osmanthus	Osmanthus
Pachysandra	Spurge
Pieris	Japanese Pieris
Pyracantha	Firethorn
Rhododendron	Rhododendron
Sequoia	Redwood
Skimmia	Japanese Skimmia
Taxus	Tax
Thuja	Arborvitae
Tsuga	Hemlock

Hardwood cuttings

Hardwood cuttings are taken during the winter when the plant is dormant. Most frequently, deciduous rather than evergreen plants are involved. Since deciduous plants lose their leaves each fall, they are the least subject to wilting. Being dormant, their tissues are well matured and food reserves in the stems are at their peak. Cuttings of this type are made 6 to 12 inches long and have a minimum of three nodes or buds. The basal cut should be made just below a node. Wood from stems exhibiting moderate growth should be used, since stems which have grown too fast or too slow do not give as good rooting results.

Hardwood cuttings are the most tolerant of rooting hormones, but in most cases, the least responsive to them. Usually these cuttings are simply placed out of doors, deep in sandy soil, leaving but a single bud above ground. It is best to place them in the ground in early spring before the buds begin to grow. Some propagators cold store their cuttings in plastic bags of moist peat moss until the ground beds are properly prepared. Storing the cuttings upside down tends to retard bud growth. Wood for cold storage can be taken any time after the leaves drop in the fall.

Hardwood cuttings require the least sophisticated propagating equipment and are often the simplest to propagate on a field basis. Rootstocks of roses, pears, and many grapes are propagated in this way. Blueberries, currants, gooseberries, and, to a lesser extent, some fruit trees are propagated by means of hardwood cuttings. The ornamentals listed below are generated by this method.

Generic name	Common name
Berberis	Barberry
Celastrus	Shrubby bittersweet
Chaenomeles	Flowering quince
Cytisus	Broom
Forsythia	Golden bells
Hydrangea	Hydrangea
Kerria	Kerria
Kolkwitzia	Beautybush
Ligustrum	Privet
Lonicera	Honeysuckle
Philadelphus	Mockorange
Populus	Poplar
Rosa	Rose
Salix	Willow
Spiraea	Spiraea
Symphoricarpos	Snowberry or waxberry
Viburnum	Viburnum (deciduous species)
Weigela	Weigela
Wisteria	Wisteria