

Grafting on Bare-Root Stock of Small Standard Trees

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I will discuss and describe the grafting on bare-root understock of small standard trees of the following:

Understock	Scion
<i>Caragana arborescens</i>	<i>C. arborescens</i> 'Lorbergii' <i>C. arborescens</i> 'Pendula' <i>C. arborescens</i> 'Walker' <i>C. frutex</i> 'Globosa' <i>C. tragacanthoides</i>
<i>Syringa reticulata</i> 'Ivory Silk'	<i>S. vulgaris</i> cultivars <i>S. meyeri</i> 'Palibin' <i>S. microphylla</i> 'Superba'
<i>Prunus americana</i>	<i>P. x cistena</i>
<i>Prunus cerasifera</i> (with interstem of <i>P. nigra</i>)	<i>P. triloba</i> 'Multiplex'
<i>Salix viminalis</i>	<i>S. caprea</i> 'Pendula' <i>S. integra</i> 'Hakuro Nishiki'
<i>Euonymus europaeus</i>	<i>E. fortunei</i> Emerald Gaiety® <i>E. fortunei</i> 'Vegetus' <i>E. fortunei</i> 'Canadale Gold' <i>E. fortunei</i> 'E.T. Gold' <i>E. fortunei</i> 'Sunrise' <i>E. fortunei</i> 'Sunspot' <i>E. alatus</i> 'Compactus' <i>E. nanus</i> var. <i>turkestanicus</i>
<i>Malus</i> MM111 (with interstem <i>M. x adstringens</i> 'Hopa')	<i>M. sargentii</i> 'Tina' <i>M.</i> 'Sir Galahad' <i>M.</i> 'Lolipop'
<i>Cotoneaster bullatus</i>	<i>C. apiculatus</i> <i>C. dammeri</i> 'Coral Beauty' <i>C. dammeri</i> 'Eichholz' <i>C. x hessi</i>
<i>Ulmus</i> 'Dodoens'	<i>U. glabra</i> 'Camperdown'
<i>Morus alba</i>	<i>M. alba</i> 'Pendula' fruiting <i>M. alba</i> 'Chaparral' fruitless

All understocks are field grown, fall dug, cleaned up (but not root pruned till grafting time), put in bins (with roots packed in bark), and stacked in a cooler. Most understock are frozen to -2C all winter with humidity maintained. An exceptions is *E. europeaus* which is propagated from softwood cuttings and pot grown to 1.5 to 1.8 m in 1 year. These euonymus are overwintered in a double

polyhouse (almost frost free). The *Salix* stems are cut from a stock block in late winter and stored for 1 month in bundles wrapped in polyethylene.

At the end of Feb., the packed bins are removed from the -2C temperature storage and allowed to thaw slowly at 15C. The understocks are usually cut 1.25 m height and the roots are pruned as little as possible.

Scions are gathered at this time on frost-free days and stored at 0C in black plastic bags.

Three types of grafts are utilized:

- Whip graft with most cultivars;
- Whip and tongue on *Caragana* stems;
- Triangle (we call it) or inlay graft on plants where the understocks is 2 or 3 times larger in caliper than the scion.

We try to fit scions as close as possible to the stem caliper and match the cambium on at least one side if they do not match. Grafting rubber strips are used for tying, finished with a loop hitch for easy removal. The *Salix* are grafted on unrooted stems and tied with polyethylene tape. Tight rubber strips seem to damage the scions.

Completed grafts are dipped in wax which covers the total scion and graft union. The wax is melted in a special wax pot at a temperature of 65C. (The wax is made in Canada by Dilmont in Montreal; distributor is Timm Enterprises, Trafalgar Road in Oakville, Ontario).

Grafted stems are transported to our Bouldin & Lawson Honcho potter adapted for potting these trees. The potting medium is peat and sand (1 : 1, v/v) and it is packed around the roots. The potted grafts are then transported to a double polyhouse covered with white (50%) plastic on the outside and a clear layer of plastic on the inside. A minimum temperature of 8C is maintained by a propane space heater. The polyhouse is about 30 m long and equipped with two household fans to keep the air mixed. The sun and spring-like weather will soon increase the temperature to 25C with the space heaters gradually running less and less. After 6 weeks callous is evident.

Suckers on the stems are removed by hand (glove covered) up to the last branches under the scion which are retained to help keep the sap flowing to the grafted scion. Insecticides are applied at this time with a fungicide used during periods of dull weather.

Venting is done very sparingly at first, unless the inside temperature goes over 33C. After 8 to 10 weeks, all suckers on the understocks are removed. More air is given and by 10 weeks the plastic is removed and replaced by 50% shade cloth. The grafts receive full sun light for approximately 2 weeks prior to field planting.

The new scion growth on the grafts is cut back to 15 cm above the graft union and the grafts are planted in well prepared land with a tree planter. Grafts are staked using galvanized stakes with the grafting rubber strip removed at this time.

The *Salix* grafts are container grown with drip irrigation. A stake is pushed through the bottom of the pot into the soil beneath to keep them from blowing over.

Most grafts are sold with a 2-year head—except for the *Euonymus* which are sold with a 3-year head.

SUMMARY

Successful grafting depends on these factors: good healthy understock, good healthy fresh scionwood, proper environment, proper carpentry suited for the species, staged removal of suckers, good cultural practices during the process—watering, spraying, and oh yes, we do not fertilize the pots (the potting medium is a mix with some super phosphate added). We tried Osmocote top dressing and almost lost a crop because heat in the polyhouse gave a fast release. Irrigation saved them.