Grafting Dormant Deciduous Fruit Scions

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Grafting is insertion of a dormant short stick (scion) of desired plant into a compatible rootstock, tree or shrub.

Why Graft?

Grafting allows multiple varieties on one plant:

- Can grow mix of early to late fruit
- Achieve cross pollination
- Foil frost with different bloom times
- Preserve antique or local varieties

Grafting allows use of specialized roots for:

- Size control with dwarfing rootstocks
- Earlier fruit on dwarfing roots
- Matching root to soil type for healthier tree
- Pest resistance from some rootstocks

Grafting an interstem allows a dwarfing effect on full-size or specialized roots. They must be 6-8" long for full effect. Interstems use two grafts over two years.

Can grafting cause problems?

Scions can carry virus such as apple mosaic virus. In multi-grafted trees, a fast-growing varieties can choke out others.

Why does grafting work?

Similar species can re-grow into each other. Matching of the filmy, thin, green cambium layers of scion and stock allows food to be transported between the two pieces. Best growth takes place with maximum matching of this layer found directly under the bark.

What scions and base plants are compatible?

Selecting the right rootstock can be complicated. Generally it is best to graft to the same species, but to control size and solve soil problems, others are used. Some scions may graft successfully and grow for a while but not bear fruit (e.g. peaches, almonds and apricots on Japanese and European plums, etc.). Consult experts if in doubt.

Graft these only on the same kind (self):

- Apples, autumn olives and goumi (both
- Elaeagnus), filbert, jujube, Nanking cherry,
- olive, pawpaw, quince, sea buckthorn (Hip-
- pophae ssp.), Juneberry (Amelanchier spp.)

These fruit have more grafting options:

- Asian pears--self, quince, but not European
- European pears--self, most quince, many Asian
- Che--self, Osage orange
- Cherry--most pie & sweet cherries on each other
- Kiwi and hardy kiwi--on each other
- Mulberries--black and white on white
- Persimmons--all three mostly compatible

Stone fruit table abbreviations for the table :
Almond=Almd; Apricot=Apric; Peach/nectarines =Pe/Ne; Plum-European=Pl-Eur;Plum-Japanese=Pl-Jap

Y=yes, N=no, M=many, O=other

Rootstock	**Scion**	**Scion**	**Scion**	**Scion**	**Scion**
	Almd	Apric	Pe/Ne	Pl Eur	Pl Jap
Almond	Yes	N	Ob	M	M
Apricot	N	Yes	Oc	Od	Of
Peach/Nect	Y	M	Yes	Oe	M
Plum-Euro	N	?	N	Yes	M
Plum-Japn	Oa	M	N	N	Of
Pluot	N	M	N?	N?	M

Oa - Ok on Marianna 26240
Ob - Peaches short lived and may be dwarfed
Oc - Many peaches do not do well but some are ok
Od - Most European plums not compatible
Oe - Not in interior California
Of - Some Japanese plums compatible

Note: Pluots are patented and cannot be used as scions (other than from your own trees since you have already paid the royalty). Pluots make great interstems for difficult apricot scions (apricot tree/pluot graft then the following year, graft an apricot on that branch).

When do I collect scions and graft?

Collect scions when deciduous plants are dormant, the leaves are (mostly) gone, and the buds are still small, not swollen.

- In the San Francisco Bay Area--early winter
- Further north and east--into late winter
- Some plants such as filberts and plums break dormancy very early so are cut first
- Cherries, Nanking cherries, pluots and apricots are early but are later than plums
- Apples and pears start growth very late so can be cut into spring. Jujubes, mulberries, and persimmons start growth even later.

Bag labeled scions in airtight plastic bag with drops of water or a damp piece of paper towel and refrigerate at 32 degrees. Deciduous scions will keep 2-5 months , depending upon the species. Generally, graft the early growers first and the later grower last. Grafts are most successful when the sap is running and the cambium growing. (Watch for swollen buds or tiny leaves.) Grafts dry out if placed too early.

Persimmons, mulberries, kiwi, jujubes, figs, and walnuts are more difficult. They grow best if grafted when the base plant has leaves. However, some can be grafted earlier.

What part do I cut to collect scions?
Cut scions from vigorously growing, one-year-old wood with long spaces between buds and few clusters of buds. Choose single-bud wood (leaf buds) rather than clusters (flowering) or remove outer buds with finger nails, not knife. Keep single center (vegetative) bud. If some tree branch ends are cut back in spring the previous year, the resulting new growth will make good-sized wood for scions and for areas to attach grafts.

What are differences in key types of grafts?
For whip grafts--match the diameter of base and scion then make identical 1-1.5" diagonal cut on each. This simple whip graft can be modified by cutting a slight slice (1/4" long) on each face, about 1/3 of the way from the tip so they slide together. Hold the scion and base together then tape to seal out the air (grafting, floral, masking, or electrical tape all work), or tie, or use grafting rubbers to strengthen joint. Seal entire scion or just the top end with clear, light tape such as Parafilm or Buddy Tape or liquids (grafting seal, thin acrylic calk or diluted white latex paint).

For cleft grafts--saw tree trunk or branch straight across (or at a slight angle to shed water) then split 1-2" deep. Wedge open. Cut end of scion in a wedge shape, then place scion(s) into split base to maximize match with cambium. Seal open wound area and top of scion (a-crylic calk, wax, plastic paint, toilet seal wax, or silly putty). Can wrap or paint scion to keep moist.

Whip-style grafts grow well since they maximize cambium overlap. They are easy to cut but do not hold scions as tightly to the base as cleft grafts. Cleft grafts are favorites for top working (redoing a tree top to a new kind).

Sprig budding for mulberries uses a T-shape cut in a branch then insertion of scion with sloping-cut end.

How do I begin grafting?
The key goal is to keep the scion alive long enough to grow onto the base.
1. Collect supplies to identify scion: tape or labels and wire, paper and pen (to record graft location on base)
2. Collect materials to cut base and scion: knife, (many say only a very sharp one, some are using snap blades) and for cleft grafts, a saw and thin chisel
3. Collect joining materials to keep scion moist. Tape, wrap or paint choice varies with climate and personal preferences.
4. If grafting on a big tree, choose locations for grafts. New growth is best for whip grafts (not so important on cleft grafts).
5. For whip grafts, slice branch on tree first. Use a location slightly smaller than the scion's diameter (if you make a mistake cutting the scion, you then can make a second cut on the tree yet still use your same scion).
6. Cut scion, keeping only 2-4 buds (more use too much energy and therefore may not "take").
7. Attach scion to base then fix into place and seal to keep moist (see section on graft types).
8. Label then record location of graft.
9. In hot areas, scion can be shaded with a paper tent.
10. Check scions for bud swell in 3-4 weeks. A few may take 6-8 weeks to start growth. (Do not remove tape until there is at least 6" of growth).

How can I be more successful with grafts?
Practice! Cutting needs to be done carefully; cut a flat surface for a tight fit, then shave to fit. Do not allow scion cut surface to dry out (carry a spritz bottle, keep unused scions in the shade). Time of year is important. When you are beginning, choose easy fruit to graft such as apples and pears. Mulberries are more difficult and peaches and nectarines are best budded (using one bud rather than a scion stick) in the late summer.

What fruit can I grow without grafting?
Some dormant deciduous wood can start in dirt, sand, or potting soil:
Easy to root--American gooseberries, currants, grapes, figs, and pomegranate cuttings and berry roots. Gooseberries are easier during late fall.
Harder to root--Autumn olives, goumi, hardy kiwi, kiwi, and Nanking cherries
With bottom heat--some plum (especially Myro type) and pear rootstocks will start. White mulberries are more difficult unless started in the fall.
Start cuttings by:
Using at least four buds, placing two in the soil and two above ground.
Lengths of 12-24" are best but shorter are ok. Pencil thickness is good but thinner cuttings will grow, thicker mulberries and figs cuttings are better .

Sources:
University of California Leaflet 21103 *Propagation of Temperate-Zone Fruit Plants*
Some specialists in the California Rare Fruit Growers (Northern California chapters).

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