Grafting Dormant Deciduous Fruit Scions

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Grafting is the insertion of a dormant short stick (scion) of a 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, a third type of stock grafted between the rootstock and the scion, allows a dwarfing effect on full-size or specialized roots. Interstems should be 6-8" long for full effect.

Can grafting cause problems?

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

Why does grafting work?

Similar species can re-grow into each other. Matching of the thin, filmy, 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 cambium layer found directly under the bark.

What scions & base plants are compatible?

Selecting the right rootstock can be complicated. It's generally 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 onto Japanese and European plums, etc.). Consult experts if in doubt. See chart on CRFG Golden Gate Chapter website.

Graft these only on the same kind (self):

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

These fruits have more grafting options:

- On Asian pears—self, quince, but not European
- On European pears—self, most quince, many Asian
- On che (*Cudrania tricuspidata*)—self, Osage orange
- On cherries—most pie & sweet cherries on each other
- On kiwis and hardy kiwis—on each other
- On mulberries—black and white on white
- On persimmons—all three mostly compatible

Read down for tree, across for scion, answer in box
Stone fruit scion abbreviations (read across the table)
Almond=Almd; Apricot=Apric; Peach/nectarines =Pe/Ne; Plum-European=Pl-Eur; Plum-Asian=Pl-As

	Scion	**Scion**	**Scion**	**Scion**	**Scion**
	Almd	Apric	Pe/Ne	Pl Eur	Pl As
Base Tree					
Almond	Yes	No	Ob	M	M
Apricot	No	Yes	Oc	Od	Of
Peach/Nect	Yes	M	Yes	Oe	M
Plum-Euro	No	?	No	Yes	M
Plum-Asia	Oa	M	No	No	Of
Pluot	No	M	No?	No?	M

M=many; O=Other
Oa—OK on Marianna 2624
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 not compatible

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

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 and refrigerate at 32° F. 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 may 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. Choose single-bud wood (leaf buds) rather than clusters (flowering). Peaches and nectarines have 3-bud clusters—the outer buds are flowering, and the center bud is usually the vegetative bud.

If some tree branch ends are cut back in winter the previous year, the resulting new growth will make good-sized wood for scions and for areas to attach grafts.

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: labels and wire for tree; paper and pen or electronic devices (to record graft location)
2. Collect materials to cut base and scion: knife, and for larger 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. Choose locations for grafts. New growth works 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). Cut scion to 2-3 buds (more take too much energy so may not "take") plus a long 2" end to cut for attaching. 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 (called whip and tongue). Hold the scion and base together then wrap with parafilm—graft area and tip OR wrap entire scion. Then tie join with floral or masking tape for strength. OR just use heavy tape join or use grafting rubbers to hold join then seal join area and the top end with tape or liquid (grafting seal or thin acrylic calk) to keep from drying out.

6. ***For cleft grafts***—cut branch or trunk straight across (or at a slight angle to shed water) then split 1-2" deep. Wedge open. Cut scion to 2-3 buds plus a long 2" end for cutting scion for joining. Cut scion in a 1-1.5" wedge, then place scion(s) into split base to maximize match with cambium. Seal open wound area and top of scion (wax or acrylic calk). Can wrap or paint scion to keep moist. If tree and scion are the same size, can wrap with tape.

   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 large tree top to a new kind). Other styles of grafts are used for various situations and trees.

7. Label then record location of graft.
8. In hot areas, scion can be shaded with a paper tent.
9. 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 plants to graft such as apples, pears, plums or cherries. 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 root in dirt, sand, or potting soil:

Easy to root—American gooseberries, currants, grapes, figs, pomegranates and berry roots. Gooseberries are easier during late fall.

Harder to root—Autumn olives, goumis, hardy kiwis, kiwis, 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.

Root cuttings by:

- Using at least four buds, placing at least 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 mulberry and fig cuttings are better.

There are various other ways to root cuttings.

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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