



A gift for graft

A sharp knife and a sharp eye yield wonderful results

By Steve Werblow

The sap flows from one plant to the other and two plants become one. There, in the graft union that links a shoot (scion) with a root (stock), art meets science as the plants' circulatory systems fuse beneath the bark. It's an ancient craft—the Chinese tell of Feng Li, who ignored diplomatic duties to graft his precious fruit trees; thousands of years later, the Apostle Paul used an analogy of grafted olive trees in his letter to the Romans.

Today, grafting is practiced by commercial nurseries and even some intrepid gardeners eager to explore the creative possibilities.

“With a grafted tree, you always have two genetic characteristics,” says Verl Holden, a nurseryman in Silverton, Ore., who started grafting as a young apprentice in 1946 and

mentored his way to the Oregon Nurserymen's Hall of Fame. “That could be very important or just a matter of convenience.”

Hardy rootstocks can nurture delicate scions in difficult soils, he notes. Landscape trees on established rootstocks can leap into more vigorous early growth than young, self-rooted ones. Trees that tend to sprout suckers, or shoots from underground, can be tidied up by grafting to suckerless rootstocks.

Multiplication. Sometimes grafting is about perpetuating a precious line of plants. On a trip to Italy, Holden was taken by the Tonda Gentile della Langhe, a tiny hazelnut esteemed by Europe's leading confectioners. He imported 200 small trees and sat through a two-year quarantine. Grafting pieces of those

Above: Oregon nurseryman Verl Holden's grafting skill helped him create the elegant Baby Blue Eyes spruce.

trees allowed him to turn those 200 imports into 4,000 trees that supplied his own orchard and those of his hazelnut-farming neighbors.

Sometimes grafting allows horticulturists to design their own trees. Ramrod-straight trunks can be topped with weeping branches or a tight knot of lollipop-shaped foliage. Lushly flowering cherries can be augmented by a grafted trunk of copper-colored bark. Holden's patented Baby Blue Eyes blue spruce is the result of skillful grafting that ensures its symmetrical growth, as are his teardrop-shaped Austrian pines.

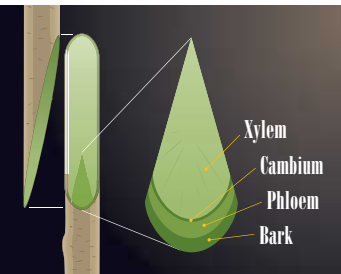
And sometimes grafting is just an exciting challenge. A legendary hawthorn tree with



105 grafts—including apples, peaches, pears, plums, cherry, and coneaster scions—is an example of the art taken to a giddy extreme. So are California farmer Axel Erlandson's outlandish “circus trees,” towering basket weaves, and living Chippendale arches.

Different approaches. There are many ways to graft plants together. The bench graft or tongue graft, which interlocks equal-sized stocks and scions, is the easiest for beginners to master. Slipping a carefully cut bud into the bark of an actively growing rootstock can be done right in the field. So can a cleft graft, inserting a pair of tapered scion spears into a much larger rootstock that's been split down the middle. Cleft grafting can take advantage of the stock's position and big root system. ▶

Top: Apple growers used to graft Golden and Red Delicious apples together so a single tree could pollinate itself. **Above:** Verl Holden grafts his favorite hazelnut scions to suckerless rootstocks to simplify maintenance in the orchard.



From top: A single, straight slice prepares a scion for grafting. A good alignment and snug fit are crucial. A quick wrap with a rubber band secures the graft union while it knits for a few weeks; it is also taped. Once healed, the graft union melds the scion and stock. The cambium tissue must connect to form a healthy graft.

The common factor among all grafts is that the cambium, the narrow ring of cells that generate the plant's sap-pumping vascular tubes, of the scion and rootstock must line up perfectly with each other.

Bench grafts are relatively easy to orient because both pieces of wood are of equal size. "If the bark lines up, the cambium will line up," Holden says. That's crucial to hooking up the sap pipeline. "In the graft union, the cells never interlock—they go head-to-head," he explains. "After the graft union is knit, we get water and nutrient transfer so the root and buds can function normally."

Choosing wood. The art of grafting starts with selecting scions and rootstocks, says Holden. Healthy plants are a must, and the best wood for bench grafting comes from first-year branches that are still dormant. Scion wood should be kept from drying out and stored at temperatures in the mid-30s to maintain dormancy, Holden maintains.

The trees that will be grafted also need to be at least reasonably closely related; though some rather daring connections can be made by experts, grafting is certainly a realm in which the old adage of keeping apples with apples makes life much easier. In fact, apples (or other pome fruits like pears) tend to be good trees for beginning grafters, as they are more amenable to grafting than, say, conifers.

And size matters. For bench grafting, wood about a half-inch in diameter is ideal, and equal-diameter scion and stock is a big plus. If that isn't an option, make sure that the scion is narrower than the rootstock and be sure to line up the cambium on one side.

Razor sharp. The most essential tool in a grafter's kit is a razor-sharp knife. Good scion-to-stock contact comes from clean, flat cuts made in a single, uninterrupted stroke—no sawing allowed. That requires a sharp blade as well as a fast hand.

Holden's sharpening technique comes straight out of the *Boy Scout Handbook*—drawing the blade of his pocketknife smoothly across a diamond whetstone oiled with WD-40. To test the results, he balances the edge of the blade on his thumbnail, then turns his hand so his thumb is vertical. If the knife bites into his nail and doesn't slip off its perch, it's sharp enough to shave with—or graft with.



Center left: Honing a razor-sharp knife edge is a daily ritual for Holden. **Left:** These hazelnut branches will be grafted to suckerless rootstocks of the same diameter.

Ready for the cut, Holden sweeps across the branches to create 1.5-inch-long angled cuts on each. He bisects each slice with a half-inch cut parallel to the grain of the wood to form a tongue. Sliding the short tongue of the scion into the slit in the rootstock, he fits the branches together snugly, makes sure bark and cambium align, and checks to make sure that the scion doesn't overlap the stock.

To secure the union, Holden wraps the join with a rubber band (which he'll remove in a few weeks to avoid strangling his new graft). Then he covers the union with waxed floral tape to keep it moist and dark. "You want to keep sunlight out of the graft union so the cambium can grow quickly," he explains. "Cambium likes to grow in the dark."

Surrounded. To help speed the healing process, Holden places the new union in a hot callus device, which nestles it in insulation around a hot-water pipe. The graft luxuriates in 80-degree comfort while the scion and stock remain in wintry dormancy.

The process takes Holden 22 seconds. That's the benefit of six decades of practice, he says with a twinkle in his eye. "I always tell my students, 'the first 5,000 grafts are the most difficult,'" he jokes. Then he grins as he considers the thousands of trees he's crafted through the ancient art of grafting. **H**

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