

Shape of Things To Come

Fruits of the Kearneysville Lab

Growing an apple or peach tree seems easy. You plant an apple or peach seed from luscious fruit you just ate, and up springs a beautiful tree that will someday bear the same, good-tasting apples and peaches—right? Wrong!

Fruit trees are not grown from seed. “Varieties of peaches, pears, and apples must be regrown from their own buds or twigs by grafting them onto rootstock,” says Agricultural Research Service horticulturist Ralph Scorza.

The size and shape of fruit trees are vitally important to growers for ease of tending and picking, as well as yield. In apples, special rootstocks are commonly used to dwarf the varieties grafted onto them. That’s why Scorza and fellow ARS horticulturist Richard L. Bell are excited about their latest development: the very first dwarf pear tree of an existing variety.

At the ARS Appalachian Fruit Research Station in Kearneysville, West

Virginia, they’re also changing the shape of peach trees and releasing new fruit varieties to give producers more of a choice.

Dwarfing Benefits Growers and Consumers

“We’ve actually been working with several genes that may dwarf pear trees, and we’ve completed research on one of them,” Scorza reports. “We used this gene, originally isolated from a bacterium, to successfully dwarf Bosc pear trees, which are growing in our greenhouse. These new dwarfs should bear fruit in 2 to 3 years. We are anxious for the first harvest.”

The research can go two ways: The gene may be used to dwarf scions, the tree shoots grafted onto dwarfing rootstocks, or to impart dwarf-producing properties to the rootstocks. Scorza and colleagues are already working with other dwarfing genes for transfer into pear.

Why dwarf the pear trees? It would allow, for the first time, a high-density production system for pears not dependent on quince rootstocks that dwarf scions but aren’t well adapted to major U.S. production districts, Scorza says.

“Our goal in this particular project is not to produce new varieties. The pear industry is based on only a few major varieties, and there is a need to improve those. Dwarfing will do that.”

There are many advantages to dwarfing fruit trees. Primarily, they’re more productive than traditional-size trees. High-density plantings of smaller trees can produce more fruit on the same land area than the larger, standard-size trees. And they’re also easier to prune, spray, and harvest. Fruit from a dwarf tree is the same size as fruit from a normal tree.

Changing Tree Shapes

Not every fruit grower will use dwarf trees. “But all growers know that the shape of a fruit tree is vitally important to the tree’s production,” Scorza says. “Right now, all commercial peach trees



SCOTT BAUER (K8495-1)

Bluebyrd plum.

grow one way: large and bushy.”

Scorza and colleagues have developed a columnar peach tree shape. “This new tree bears fruit of excellent quality. We expect to release it to home gardeners within the next few years, because it takes up very little room,” Scorza reports. ARS scientists at Kearneysville have been working on this project for about 15 years.

Home gardeners with little space will like the columnar peach tree because the upright, narrow branches that grow close to its trunk won’t shade other vegetables that may be growing close by.

This research represents a totally new system for commercial peach growers. With a tall and narrow shape, the columnar trees require much less management and will allow high-density growing. This eliminates the large space between trees that is necessary with traditional-size peaches. Chemicals and fertilizer need be applied to only a very small area, saving the grower money and sparing the environment chemical emissions.

At least three times as many of these columnar trees can be grown per unit of land. With the cost of land available for agriculture at an all-time high, this is an important factor. Since growers can plant

SCOTT BAUER (K8493-1)



Horticulturists Ralph Scorza (left) and Richard Bell discuss the effects of dwarfing genes on the growth of Bosc pears.

more of these trees in an orchard, they could increase production while cutting input costs. These savings could be passed on to consumers.

In the fall of 1998 and spring of 1999, cooperators planted the columnar peach trees in orchards in New Jersey, Virginia, West Virginia, South Carolina, Arkansas, and Michigan. "We also have cooperators in California and Washington who are considering our new tree and other shapes that we've developed," says Scorza.

The Pear Is Plumb Delicious

In addition to dwarfing and changing the tree shape, Scorza and Bell are working on new, improved varieties for fruit growers.

In 1998, Scorza released a new plum and Bell, in conjunction with researchers at Ohio State University, introduced a fire-blight-resistant pear. The most serious disease of apples and pears, fire blight is caused by the *Erwinia amylovora* bacterium and has no cure.

Bluebyrd, the new plum, is named for Senator Robert C. Byrd, who dedicated the Kearneysville research station in 1979. According to Scorza, it gives growers a firm, excellent-quality plum that is 20 percent sugars. Bluebyrd is a consistently high-producing European-type plum for the mid-Atlantic and other fruit-growing regions of the United States. "And consumers get a sweet-tasting plum," he says.

Blake's Pride, a new pear, resists fire blight, while most of the major pear varieties are moderately to highly susceptible.

"Shoots of Blake's Pride are very resistant to fire blight—and blossoms, moderately so," says Bell. "If blossoms do become infected, the infection doesn't go deep into the wood. In addition, this high-quality pear has excellent aromatic flavor, and the fruit is juicy and buttery."

Blake's Pride should be available

in commercial nurseries in 2000, and Bluebyrd is available for the first time this year.

"This research furthers our goal of giving U.S. fruit growers options that maximize productivity and quality while reducing the amount of chemicals needed," Scorza says.—By **Doris Stanley Lowe**, formerly with ARS.

This research is part of Plant Microbial and Insect Germplasm, Conservation and Development, an ARS National Program described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/cppvs.htm>.

Ralph Scorza and Richard L. Bell are at the USDA-ARS Appalachian Fruit Research Station, 45 Wiltshire Rd., Kearneysville, WV 25430-9425; phone (304) 725-3451, fax (304) 728-2340, e-mail rscorza@afrs.ars.usda.gov rbell@afrs.ars.usda.gov. ♦

SCOTT BAUER (K8494-1)



Bosc pears from a dwarfed tree.

Kearneysville Releases at a Glance

Blake's Pride –1998– A tasty, high-quality, fire-blight-resistant pear.

Bluebyrd –1998– An excellent-tasting, high-yielding plum for the mid-Atlantic and other U.S. fruit growing regions.

Potomac –1993– A fresh-market pear for commercial growers and homeowners that combines superior resistance to fire blight with good-quality fruit. Ohio State University collaborated on the release.

Bounty –1989– An important commercial peach variety, released in conjunction with the Texas A&M Agricultural Experiment Station. Big and beautiful, this yellow freestone peach is one of the best for midseason and is recommended as a replacement for Loring, the previous grower favorite.

Earliscarlet –1985– A large, very high-quality, midseason nectarine. The fruit skin is predominantly red over a golden-yellow background, and the fruit is recommended for the packed or retail market.

Sentry –1981– A tasty, firm, early-season, semi-freestone peach that grows on vigorous trees resistant to bacterial leaf spot.