



Hal Bernton/Seattle Times

In this arid acreage north of Wenatchee, workers installed a massive grid of trellises. The trellises set the stage for more automation of the harvest.

Trellises are transforming Washington's apple orchards

By HAL BERNTON
Seattle Times

UNION GAP, Yakima County — This irrigated slope used to be covered in big, stout apple trees with leafy canopies that could support a heavy crop of Golden Delicious apples.

More than a half-decade ago, excavators yanked them from the ground.

In their place, grower Aaron Clark planted spindly, shallow-rooted stock that needs to be attached to trellises to keep the fruit trees from collapsing under the weight of the Pink Lady apples they bear each year.

This dramatic makeover is part of a broader transformation of Washington's apple orchards driven by the quest to get bigger per-acre yields of high-quality fruit from trees that are easier to pick.

This shift has been underway for several decades, and intensified in recent years as growers turned to new varieties of apples that, when played on trellises, can start to bear commercial crops of fruit in as little as three years time. And the long, neat rows of densely planted trees have helped spur industry change, including experimentation with machines able to pluck fruit without an assist from human hands.

The cost of developing these orchards is steep, and can run \$50,000 an acre or higher. This has raised financial barriers for small growers seeking to expand and remain competitive, and increased the risks — and debt loads — for larger ones in a more unsettled climate, which included record heat this past summer that damaged some of the crop.

But the big dollars required to bring these acres into production have not discouraged a new wave of orchard acquisitions by outside investors in an industry that produced \$2.1 billion worth of fruit in 2020.

One of the biggest sales came in February 2019 when the Ontario Teachers' Pension Plan of Canada purchased Broetje Orchards, which spreads across more than 6,000 acres around Benton City, Benton County, and Wallula and Prescott, Walla Walla County, and ranked as one of the nation's largest family-owned operations. While the total sale price was not disclosed, the real estate brought in \$288 million, according to a tax affidavit cited by the Tri-City Herald.

This year, a lot more orchard acreage is on the market and prices are sometimes being driven up beyond what can be justified by the annual harvest revenue from the trellised orchards, according to Clark, who is vice president of Yakima-based Price Cold Storage & Packing.

"It's perplexing to us. I think they are banking on the long-term appreciation of the land," Clark said. "There's a huge wave of that coming."

'A wall of fruit'

The 58-year-old Clark is a fourth-generation Yakima Valley fruit grower who grew up in a bygone era when Red and Golden Delicious apples grown on deep-rooted trees dominated the east-of-the-Cascades apple industry. As a teenager, Clark initially wanted nothing to do with orchards, but after one year of junior college, he decided to return to agriculture. Today, he leads field operations of Price Cold Storage & Packing, which grows fruit on some 2,700 acres.

Clark says that the older generation of big trees did have some advantages, such as greater resistance to diseases like fire blight. But they often yielded fruit of uneven quality as apples grown deep within the shaded canopy lack sugar content.

Developing trellised orchards — where most of the fruit receives ample sunshine — has involved a lot of research and experimentation. Clark seeks to match an apple variety with a soil and slope elevation that will enable it to thrive. The cutting, known as a scion, must be grafted on compatible root stock.

These plantings are carefully pruned and their water closely rationed. The goal is to put these trees under a little stress so they put all their energy toward making fruit.

"If you just make a tree happy, all it wants to do is grow wood," Clark said.

Things can go wrong with this intensive orchard cultivation.

Fire blight can decimate some varieties of apples in a trellised orchard if the root stock is planted in poorly drained soils, according to Clark. And a poor match of soil, root stock and variety can produce a lot of mediocre fruit.

So Clark does some small field trials to see how things work out before opting for bigger plantings.

On a crisp November day, Clark showed the payoff for all this work, an orchard filled with prime ripe Pink Ladies, a "wall of fruit" ready for harvest.

An automated future?

In the orchards Clark oversees, pickers still climb up and down ladders to pick the apples. But it's a simpler task than in older orchards, where some workers would break with safety protocols by climbing off the ladder and onto the branches to try to reach all the ripe fruit in the far-flung canopy.

"Our biggest problem was keeping the guys on the lad-

THIS DRAMATIC MAKEOVER IS PART OF A BROADER TRANSFORMATION OF WASHINGTON'S APPLE ORCHARDS DRIVEN BY THE QUEST TO GET BIGGER PER-ACRE YIELDS OF HIGH-QUALITY FRUIT FROM TREES THAT ARE EASIER TO PICK.

ders. They would want to jump up in the tree, and we'd have to get them down and say quit doing that. But it was just quicker and easier for them," Clark said.

In the trellised orchards, the trees are essentially two-dimensional. So the pickers can place a ladder on either side of the tree, and from that perch quickly reach most of the apples.

"I like this better," said Oscar Salgado, 37, a Yakima resident who has been picking apples since he was 17.

On a typical day in these orchards, Salgado picks up to six bins of apples, which can earn him \$240.

Salgado is part of an orchard workforce that swelled to 300 at the harvest peak and by early November had tapered down to about 100. Their wages are on average slightly more than \$20 an

hour. The top pickers, however, may make as much as \$35 an hour, per hour, according to Clark.

While many growers have turned to workers brought in from Mexico or other countries under temporary H-2A visas, Clark has been able to attract enough local workers from the Yakima area to get the apples off the trees. He plants varieties timed to ripen in a progression stretching from August to November.

But the cost of labor, and the chronic shortages of U.S. farmworkers, have helped to drive harvest automation, which can more readily be accomplished in the uniform layouts of the trellised orchards.

Already, some growers have invested in elevated platforms, which move slowly down the rows on self-driving machines and enable

pickers to do away with ladders. In some models, the apples can be put directly into bins that sit on the platform.

During the past five years, there also has been a push to figure out a way to harvest the apples with mechanical pickers. This is a difficult task as, even with the aid of artificial intelligence, some machines have had problems, such as bruising.

One high profile startup launched in 2016, California-based Abundant Robotics, used a mechanical arm to vacuum apples off trees and send them into bins. It was tested in New Zealand in 2019 but this summer shut down operations because it "was unable to develop market traction necessary to support its business during the pandemic," according to a July 1 liquidation memo that put assets up for sale.

Other companies continue to try to commercialize automated harvesters, including FFRobotics, an Israel-based company that tested its machine in Washington orchards this past summer. This harvester uses "advanced image processing technology" to identify ripe apples that are picked by six arms that snip off the fruit.

"They were in an orchard

that was not known to the public so they could work the bugs out. At the end of the of the season, we had several field trials," said Ines Hanrahan, executive director of the Washington Tree Fruit Research Commission, which has worked cooperatively with that company as well as others to develop robotic pickers.

"We have to start automating if we are to sustain the businesses. We have learned from the failures and we feel confident we will be able to have a commercially viable solution within the next decade and probably earlier than that."

Clark is not eager for that day to come.

"It would be good for business, I think, but it would be a sad day for me," Clark said. There's a lot of things about harvest I like, and all of them involve the people that we have coming here to work ... I don't have any interest in shaving every (expletive) nickel out of everything I can. These folks are my neighbors."

As he spoke, Mexican music blasting from a radio resonated through the orchard rows as pickers filled bag after bag with Pink Lady apples.

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