The Rise of Self-Fertile

The almond industry is decoding tree genetics

By Crystal Nay

Tom Burchell speaks to growers during a town hall meeting introducing the Nonpareil+ variety. Photo: Matt Hannon

More self-fertile almond varieties are making their way into orchards. Gene-editing technology is improving quickly and has drastically shortened the time frames required for plant breeding.

And almonds have been a welcome challenge for such tech.

Whether developed at the rapid pace of gene editing advances or through years of careful traditional breeding, these varieties represent a long journey of innovation and now offer exciting new options for growers.

Nonpareil

The most recent varieties to grab headlines were two offerings of self-fertile Nonpareil, offered by Burchell Nursery as its proprietary Nonpareil+, and by Sierra Gold Nurseries as the exclusive distributor of FruitionOne by Ohalo Genetics.

Nonpareil+

Nonpareil+ is the newest offering from Burchell Nursery's breeding program, in collaboration with Verinomics. It's been over a decade since the release of the nursery's first self-fertile variety (Shasta in 2015), and many more have followed.

By using CRISPR Cas9 gene editing technology and marker assisted breeding, Nonpareil+ is the first variety to skip the time-intensive waiting game that comes with traditional breeding.

"I wouldn't have to wait to plant that seedling out, to grow it," said Tom Burchell.

He sent commercial varieties to be genetically mapped so that he could start identifying favorable traits.

"Then we identified the location in the genome that controls self-fertility," he said.

Nonpareil rejects its own pollen, but there is a mechanism in the almond that can be "switched on" in order to have it accept its own pollen.

Nothing was added or inserted into the variety.

"It was just a matter of allowing the Nonpareil to recognize its own pollen and accept it rather than reject it," Burchell said.

The expectation now is that when trees are planted in the test orchard, everything about Nonpareil+ is the same as Nonpareil—the same

type and size of tree, the same flower and timing of flowering, same nut, characteristics, and harvest timing.

Though it's exciting news for the industry's standard almond, Burchell admits to being more conservative when proving out the variety.

"Even ones that are supposedly genetically the same, I want to see them side by side. We know there are even little nuances going up and down the state."

Burchell plans to collaborate with the test growers and have them document characteristics to confirm that the self-fertile variety stays true to the traditional one. This will include bagging branches and netting entire trees.

Trees will be limited for the 2026 season, with more commercial availability expected for 2027.

FruitionOne

Reid Robinson, CEO of Sierra Gold Nurseries, holds the same expectation for FruitionOne, the self-fertile Nonpareil from Ohalo Genetics and available exclusively from Sierra Gold Nurseries.

"I don't know that you'll be able to tell the difference between the two (self-fertile and self-incompatible) Nonpareils. They're essentially identical with just this one small change."

Sierra Gold and Ohalo have been collaborating for about five years on various projects, with the self-fertile Nonpareil project taking off first.

"We have the ability to edit at meiosis rather than the mitosis level," said John Dombrosky, chief commercial officer at Ohalo, "which allows us to create different ploidy in crops. I think this is by far the most exciting technology."

Ploidy is the number of full sets of chromosomes in an organism. While plants typically receive half their genetic information from each parent plant, Ohalo has discovered a way to transfer all the parent plants' genetic information to the offspring.

Plants are of a diverse ploidy, as they've adapted to the environment over millennia. That same evolution can be used to create new

Grafts of Ohalo's FruitionOne, a self-fertile Nonpareil. Photo: Micah Stevens, Sierra Gold Nurseries

germplasm for globally significant crops.

"New germplasm tools that have a higher yield and better disease and abiotic stress profiles will be vital for global farming in the next 15 to 20 years," Dombrosky said.

Though Sierra Gold is taking small-scale, tentative orders, FruitionOne will also be limited for 2026. The nursery expects larger production for commercial availability in 2027.

Other new varieties

Early Bird

EarlyBird, on the other hand, is Sierra Gold's proprietary, trademarked self-fertile variety. It's the result of a decade-long breeding project that focused primarily on kernel quality and worked backwards from there to improve other traits.

"Let's try to check all the boxes on the tree that we can for self-fertile,'" said Robinson of the initial game plan. "We screened thousands and thousands of trees."

It's been a nice first release, said Robinson. EarlyBird has a very consistent light blonde kernel, low doubles, nice in-shell characteristics, and harvests about seven days earlier than Nonpareil. Tree architecture is midway between Nonpareil and Monterey, the upright stature grows vigorously, and it's compatible with all the major rootstocks.

Released in Dec. 2023 at the Almond Conference, the first commercial plantings occurred in 2025. Though EarlyBird is still in its early days of being on the market, Sierra Gold is excited about where it's going to find its role in the industry, perhaps in niche spaces and possibly in other categories outside of California.

"It's going to give people options, and we just try to provide people with options. The industry is going to figure out where it's going to fit best and how it's going to be best monetized," Robinson said.

Yorizane

In 2021, USDA released self-fertile variety Yorizane. It was selected for trial in 2003, and was part of the 2014 Regional Almond Variety Trial planting where it was evaluated in various California counties.

Self-fertile vs. Self-pollinating

Though often used interchangeably, self-fertile and self-pollinating are not the same, but refers to different aspects of reproduction.

A self-fertile plant is compatible with its own pollen, but may need assistance with pollination, such as with bees.

A self-pollinating plant can transfer pollen from the anther to the stigma on its own. While many plants can be both, this is not always the case.

Tissue culture of self-fertile varieties. Photo: Burchell Nursery

In a current variety trial in Modesto, California, managed by Duarte Nursery, Yorizane on Hansen did 1,013 lbs. per acre in second leaf and with no bees.

This result has led the nursery to evaluate just how self-pollinating Yorizane is.

"We didn't put any bees out last year, because we didn't think we were going to harvest anything," said Isaac Duarte, director of farming at Duarte Nursery. "Maybe this thing just doesn't need bees, so that's what we're trying out this year."

Yorizane has found some fanfare. It's a heavy-yielding variety with a high quality kernel. Not only is it a royalty-free tree, but it does well on Hansen, a royalty-free rootstock.

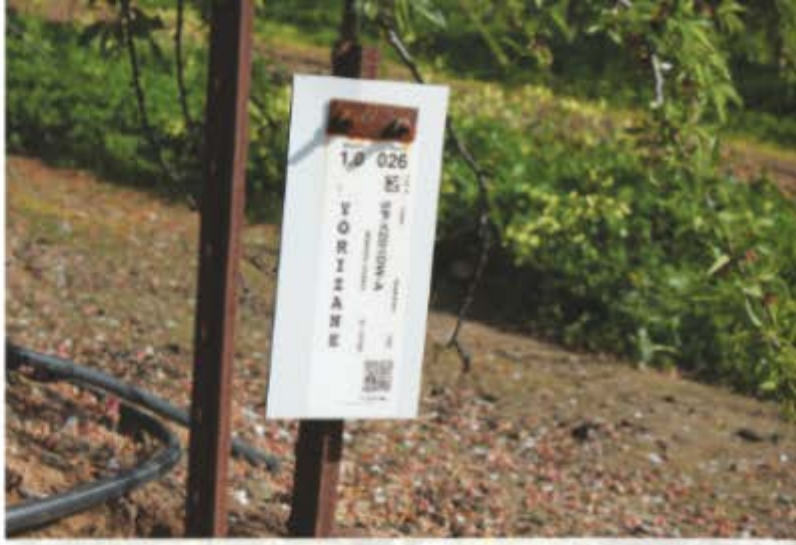
"It's a huge cost savings to the grower, to have a completely royalty-free tree that is shown to have significant yields," said Duarte.

It's a smaller tree, he said, but the most yield-efficient tree. This paired with a high light-capture design at 10' x 20' and no pruning, it should be among the highest yielding blocks for a grower. Additionally, the characteristic butterfly hull allows the nut to dry on the tree.

"We got it down to 6% on the tree last year," said Duarte. "It comes off super clean, super easy, so you don't have to shake the heck out of them."

As the industry moves more toward off-ground harvesting, Yorizane will also fit well into the catch frame system for these reasons.

This variety has similar bloom and harvest timings as Nonpareil.



The original self-fertiles

Independence - 2008

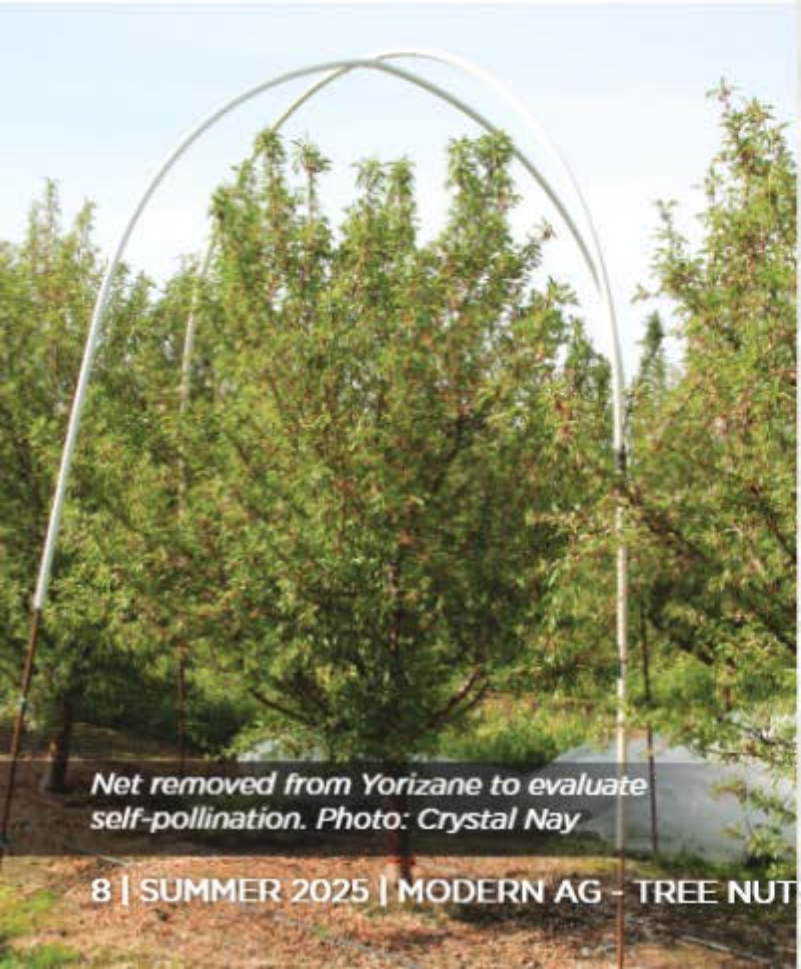
Independence is a prolific bloomer and has the same bloom interval as Nonpareil, though it can be harvested a few days before Nonpareil. The nut is large and light in color and offers a sweet flavor. While Independence can set a commercial crop without placing commercial hives, growers have found higher yields with the inclusion of bees.

Shasta - 2015

The first of the Burchell Nursery self-fertile varieties, Shasta is an early and heavy producer with a 60-65% crack out. Light, smooth kernel. It blooms and harvests slightly ahead of or with Nonpareil, and has a light, smooth kernel.

Pyrenees - 2019

Another from the Burchell Nursery breeding program, Pyrenees is a medium-sized nut that has a unique amaretto flavor. It's a medium-sized tree of vigorous growth and a crack out of 50-55%. It shares bloom times with Nonpareil, but it harvests about two weeks after Nonpareil.



Net removed from Yorizane to evaluate self-pollination. Photo: Crystal Nay

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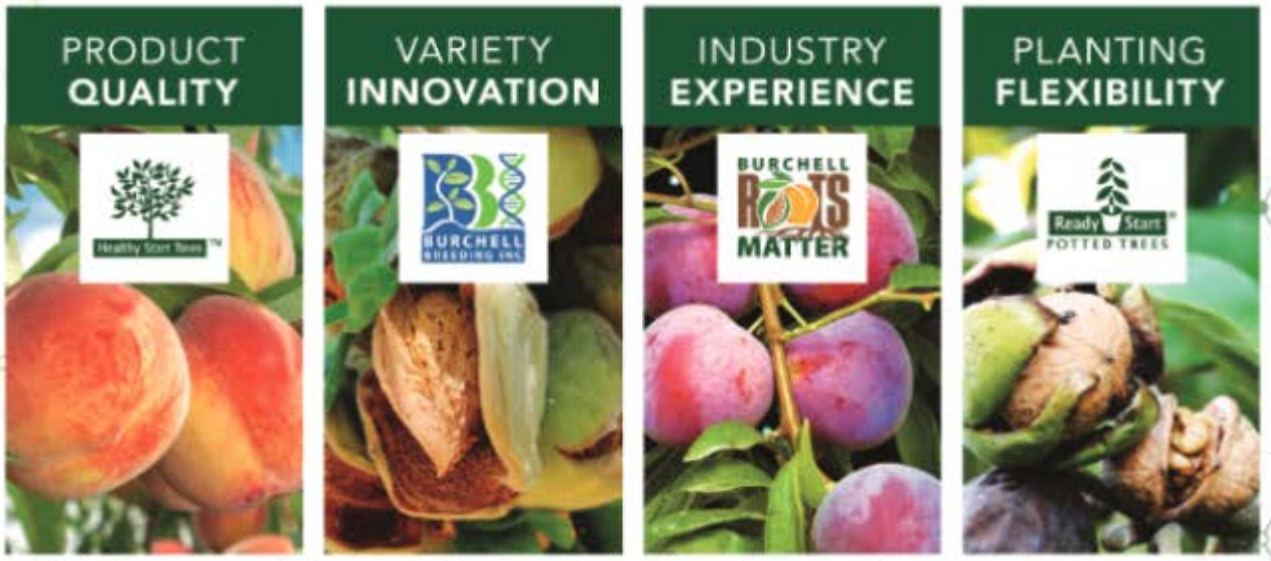

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