

Cornell research orchard seeks the perfect apple

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Cornell University faculty leader in the apple breeding program, Dr. Susan Brown, stands in an apple orchard at the Cornell University's Fruit and Vegetable Research Farm in Geneva, N.Y., Monday, Sept. 23, 2013. (AP Photo/Heather Ainsworth)

Trees at Cornell University's research orchard this fall are heavy with waxy apples, deep-red, round apples, oblong apples and aromatic apples that smell like autumn.

The thousands of trees here are tended for a single goal: to grow apples with just the right mix of sweetness, tart and crunch.



The orchards, part of the New York State Agricultural Experiment Station, are essentially a 50-acre lab devoted to developing apples that are tasty for consumers and hardy for farmers. The station has released 66 <u>apple varieties</u> over more than a century including Cortland, Macoun and two new entries at farm markets this fall: SnapDragon and RubyFrost.

"I could never be a medical doctor; I don't like blood. But I can create," breeder Susan Brown said. "I can manipulate things and create stuff that no one else has seen or tasted, and sometimes it's a home run and sometimes it's a spitter."

Brown, a Cornell professor of agriculture who has been breeding apples since 1990, walked through the <u>apple</u>-dappled rows on a sunny day this week offering test chomps. One apple was juicy but mushy, another exceptionally firm and crisp.

"You would not want to eat this with dentures," she said with a laugh.

Brown's team is looking for crisp apples with a good balance of sugar and acid. It also pays close attention to "volatiles," or the aromas like a hint of cherry or grassiness that contribute so much to an apple's flavor. But researchers also want farmer-friendly apples that hold up well against insects, fire blight and apple scab and during shipping.

One promising variety was rejected because its leaves were prone to spotting and falling off the tree. A green apple that might have been able to compete with the Granny Smith was discarded because it was susceptible to blister spots.

"It's only skin deep," Brown said of the blistered apple, "but consumers are still going to find it objectionable."



The researchers here have access to cutting-edge technology, but the mechanics of their breeding work is similar to what their counterparts have done for generations. Pollen is collected from unopened blossoms and applied to female parts of another tree's flower. It can take four years before a seedling produces fruit ready for tasting.

Researchers try to combine desirable traits from two different apples like the snappy sweetness of one and the resistance to insects of another. But just like a mom and dad can have children who are very different from each other, new apples can fall far from the tree, figuratively speaking. Research assistant Kevin Maloney says about 95 percent of the seedlings they plant are discarded. The neat rows of trellised trees have gaps where apples that didn't make the cut had grown.

"It's a numbers game. We plant out thousands and thousands of seedling trees," Maloney said. "If they're not exceptional quality or something we can use in the breeding program, they're removed."

Brown has high hopes for their two new apples developed in partnership with the members of New York Apple Growers, which will initially be sold at dozens of farm markets in New York this fall.

SnapDragon is a cross of Honeycrisp with a Jonagold-like hybrid that's easier for farmers to manage. RubyFrost, which ripens later in the fall, has high vitamin C content and resists browning, which is important now that apple slices are such a large part of the retail market.

As picking season for SnapDragon dawns, Brown is already thinking of the next generation apple. She believes she can breed an apple that is resistant to browning. And she thinks she can up an apple's vitamin C content to the level of an orange.

"I've already made the next generation, crossing SnapDragon and



RubyFrost," she said.

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