

Fruit Research Station

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what controls the level of cold hardness in woody tissues, and at what point it changes. And we need to do more of that kind of work to verify that our hypotheses are correct." Knowledge they obtain about the woody portions of the tree will be applied, later on, to studying the flower buds and how to make them more cold-hardy.

'Natural' approaches

Right now, orchardists are faced with two "natural" approaches to keeping their fruit trees from cold damage. One is intervention methods, including windmills and microsprinklers, and another is to focus on "bud hardness."

But Wisniewski cautions that, under most conditions, trees will be affected by cold extremes, especially the tree buds. "I don't care what the cold hardness of the tree is, there's no way you can expect a tree to not receive some severe frost damage if it's going to flower a month early." A short-term approach to alleviating the problem of spring frost is to investigate various intervention methods.

Another method would be to use a process to somehow delay the bloom. There are some methods of keeping the trees dormant for longer periods of time by applying an ethephon coating to the plants in the fall, which delays blooming by two weeks in the spring.

"But that's a double-edged sword," said Wisniewski. "Ethephon has a lot of other effects on trees besides causing it to have bloom delay. If you apply too much of it, you can have a lot of physiological disorders."

Fruit ripening

Orchardists must also realize that the fruit ripening may be delayed for up to a couple of weeks and must prepare for that. "If we don't have a killing frost in the spring, that means all the other

orchardists are getting out their crops two weeks earlier, or three weeks earlier than you. The first with the best makes the most money," he said.

Peach tree hybrid testing puts special emphasis on the genetic factor in crossbreeding. Genes are carefully targeted for certain fruit characteristics, in addition to cold hardness.

"We're attacking the problem kind of from the 'back side,' you

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might say," said Miller. "We're trying to find the quality genes and put those into cold-hardy plants."

Miller indicated that there are a combination of genes that researchers usually seek when developing a variety. There probably are many different genes involved in cold hardness.

Fruit quality

"Scientists several years ago determined that it would probably be easier to find a gene that was responsible for a particular fruit quality, see if we can actually move that into a cold-hardy plant, and get a fruit that would show this characteristic, let's say, firmness of fruit," he said. More likely, that attribute "is probably the result of many, many genes, not just a single gene."

Conventional breeding techniques, where plants are cross-pollinated, have been used for centuries. These "controlled crosses" are replanted again and again until a more viable hybrid is discovered. This takes time — sometimes as long as 15 to 20 years.

Earliscartlet is a high-quality, cold-hardy nectarine. The nectarine is "a cross of some nectarine germplasm from the East," said Dr. Ralph Scorza, research horticulturist and lead scientist of the germplasm enhancement unit.

"Some cold-hardy nectarines were crossed with some high-



Dr. Michael Wisniewski examines a peach bud magnified 1,000 times through a scanning electron microscope.

quality nectarines from California," said Scorza.

Produced fruit

The plant has been tested and has produced fruit even when January temperatures have fallen to -6 degrees Fahrenheit, according to tests undertaken in Byron, Georgia. The nectarine was under development by Dr. Harold Fogle, of the Beltsville, Maryland ARS, and was released to fruit growers in 1985.

The scientists study several methods of breeding fruit trees for cold hardness.

"There are several ways you can get around the problem of cold," said Scorza. "Number one, you can have absolute cold hardness — physiological mechanisms that enable those cells to survive very cold temperatures. We can have mechanisms that make them stay dormant even when normally they would like to go out of dormancy."

One of the mechanisms is "late bloom." Another, according to Scorza, is giving the tree a higher bud density, which will produce

more flowers. Even if 80 or 90 percent of the buds are killed by frost, because of the abundance of buds, chances are likely that more fruit will survive until harvest.

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Hardiness difficult

"Cold hardness is difficult, because it's so dependent on a particular year and a particular grower's layout of the land," said Scorza.

In the meantime, the research station is careful about their studies before releasing budwood to growers.

"Once you release it, you want to be pretty sure that you are not going to have a grower put down 5, 10, 20, or 100 acres of it and suddenly it does not do well," said Scorza.

But Scorza emphasized that only a "real test" will tell.

Ultimate test

"That's why I would advise growers that they can get all the information they want about a cultivar, but the ultimate test is putting in the new variety and testing it in your own soil, your microclimate, and your spray practices," he said.

"We work with the orchardists," said Miller. "We try to coordinate our efforts and work through the state experimental station fruit specialist or extension agents. They have the 'first-line' responsibility for the fruit industry. We try to transfer the technology to those people and allow them to transfer it to the orchardists."

Buffalo Bill To Appear At Rodeo

Visitors to this year's Dave Martin rodeo will have a chance to witness a peculiar oddity of nature, a thrilling exhibition of man vs. beast, the nastiest ten year old alive, and a national celebrity all rolled into one!

Ten years ago in Ivanhoe, Tx. a knobby kneed, wobbly legged beefalo calf was taking his first steps. His mother was a rambunctious black brahma crossbred cow sired by a full blooded buffalo bull. The little calf was one of a small herd owned by Jackie Gibbs, a professional bull rider. Jackie was toying with the idea of crossing cattle and the American Bison and raising beefalo calves for rodeo stock. Jackie "christened" this particular calf "Buffalo Bill."

On New Year's Eve when the calf was full grown at an indoor bull riding jackpot in Shawnee, Oklahoma, Lane Frost 1987's reigning World Champion Bull Rider drew Buffalo Bill for the final go round. When the dust settled, the noise from the crowd was deafening. The spectators were cheering so loudly that it was difficult for the judges to hear the eight second whistle signalling the end of the ride. When the judges decision came in the great Beefalo had been ridden. Lane scored ninety points and won the contest. Misfortune befell Lane Frost

later in his career. He was killed by a bull in a rodeo at the Cheyenne Frontier Days in Wyoming. As of the writing of this release in 1990 the late Lane Frost is the only cowboy to have ever conquered Buffalo Bill.

Bill spent a year in South Carolina and toured the Southeast with Ernie Treadway's Rodeo Co. as a nine year old. From there he was purchased by rodeo promoter Dave Martin of Gettysburg, Pa. to tour the Northeastern U.S.

Martin, along with sponsor Manheim Saddle Cinches 4-H Club are offering a \$1,000 bounty to challengers of Bill. They must ride for eight seconds in order to qualify. Would be jockeys can get more information by calling (717) 334-7724, or (717) 398-7486.

"When you come to a rodeo to

watch Bill buck, you don't want to blink because he can usually eject his rider within two or three seconds after the chute opens," Martin explained. "There's no doubt about it, he's THE MEANEST BEAST IN THE EAST."

Buffalo Bill will be featured along with the standard rodeo events; Bareback Bronc Riding, Steer Wrestling, Saddle Bronc Riding, Cowgirl's Barrel Racing, Calf Roping, and Bull Riding at the Rodeo at the Buck Tractor Pull, on Memorial Day, May 28. Performances are at 2 p.m. and 7 p.m.

Tickets are available at Leather Attic, Park City Mall, Maplehofe Farm Dairy, Quarryville, Cape Horn Corner, Red Lion and Deer-skin Leather, Intercourse.

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Dr. Michael Wisniewski, plant physiologist at the ARS Appalachian Fruit Research Station, inserts a peach bud sample into a cryotransfer unit for scanning on the electron microscope.



Different sizes of peach trees are under development at the AFRRS in Kearneysville, West Virginia.