Key to delicious tree fruit is keeping it out of the “killing zone”

The fond memories of delicious peaches just plucked from a backyard tree or purchased at a roadside stand can now be relived with fruit picked up at the neighborhood grocery store. The key to great-tasting fruit with a pleasing texture, according to a UC scientist based at the Kearney Research and Extension Center near Parlier, is in the way it is handled after harvest.

As long as anyone can remember, peach, plum and nectarine producers have tried to cool their fruit down as quickly as possible after picking, and keep it cool until it was placed in a grocery store display. But UC postharvest physiologist Carlos Crisosto discovered that the practice was subjecting fruit to what he calls the “killing temperature zone.”

Years of work in the state-of-the-art Gordon F. Mitchell Postharvest Laboratory, established in 1992 at Kearney, has resulted in a completely new protocol for peaches, plums and nectarines as they journey from the farm, to packing sheds, in the backs of trucks to distribution centers and finally to the supermarket produce aisle.

“This has rocked our world,” said Mike Thurlow, the sales manager for Mountain View Fruit in Reedley, whose company used to pick, pack and ship as quickly as possible. “For us to pick our fruit and delay the cooling, fiddle around with humidity, pressure and brix, then ship it two, three or four days later, ready to eat – that is totally opposite to what we had been doing.” (Brix is a measurement used by the food industry to estimate the amount of sugar in fruit.)

Even though it was hard to accept at first, the packing houses have learned that the new protocol – for which Crisosto has coined the term “preconditioned” – results in better tasting fruit, and subsequently, better sales of this Central California summertime staple.

“Preconditioned fruit is like the fruit you remember eating as a kid when you went into your backyard and picked a peach off a tree,” Thurlow said. “We are now able to commercially ship fruit that in years past you could’ve only bought at a farmers’ market.”

Fresh peaches, plums and nectarines represent an important part of the California agricultural industry, with crop production valued at $250 million in 2004. The state supplies fresh fruit to every state in the nation and several countries overseas. California produces more than 90 percent of the nectarines and plums in the United States and provides about 60 percent of the peaches. The earliest California tree fruit are harvested in mid- to late-May, but the bulk comes off trees in June, July and August. A few California fruit are still being picked as late as October.

Peach, plum and nectarine consumption has remained static in the United States the past 20 years, despite repeated recommendations from the federal government and the medical industry to eat more fruit for better health. Surveys by researchers and the tree fruit industry have pinned the lack of sales growth to negative experiences with fresh fruit, such as lack of flavor, off flavor, flesh mealiness, dry fruit and flesh browning.

“After biting into a mealy or off-flavor peach, consumers won’t likely buy any more,” Crisosto said. “We can improve the eating experience by carefully managing the peach’s journey from the farm to the consumer’s palate. That expands and strengthens the market for fresh fruit.”

In the past, UC researchers recommended fruit be cooled immediately after harvest and kept at 32 degrees during transportation and handling.

“The problem with that,” Crisosto said, “is that most of the facilities for transportation, distribution and retail sales cannot hold fruit that low. It just doesn’t work in the real world.”

As a result, fruit would be exposed to a temperature range of 36 to 50 degrees, the range he calls the “killing zone” because it halts ripening and damages the fruit. Crisosto studied previous research, worked closely with the industry and exposed fruit to a wide variety of temperatures in five temperature- and humidity-controlled fruit storage chambers. He found that, in general, if the fruit is held at 68 degrees for about two days following harvest, until it reaches a specific level of ripening measured by fruit firmness, and then cooled down, shelf life can be extended seven to 15 days and, most importantly, the fruit would be more consistently pleasing when it reached consumers’ mouths.

“It initially blew our minds to walk out into our ripening room and smell fruit,” Thurlow said. “We’ve got a lot of money out there ripening.”

But soon packers and grocers realized that preconditioning produced a better product. Grocery companies now offer premiums of $1 to $4 per box of preconditioned fruit, compared to fruit that has been handled the old way.

“It’s made a huge difference in the quality of the fruit we provide to the consumer,” said Herb Kaprielian of Kaprielian Brothers Packing Company in Reedley. “We are able to deliver fruit that is juicier and more consistent in quality.”

A group of fruit packers, including Kaprielian Brothers, have pooled resources and developed a brand for fruit that has been preconditioned called “Ripe ‘N Ready.” According to Steve Kenfield, the manager of Ripe ‘N Ready, some grocery chains will stock only preconditioned fruit.

“Retailers take the heat for fruit not eating well,” Kenfield said. “Retailers are looking to stop those complaints.”

More than 200 varieties of peaches, 200 varieties of plums and 175 varieties of nectarines are sold commercially from California – each with its own harvest time, flavor and color. Crisosto has found that each one also has its own specific needs in terms of postharvest storage temperature and timing.

Identifying each variety’s needs will keep the industry and its research partners at the University busy perfecting fruit handling protocols in order raise consumers’ confidence in the peaches, plums and nectarines they buy at stores.

"You can't shame people to eat more healthy food," Kenfield said. "They have to enjoy it. We are working to fix the eating quality of fruit."

Tips for handling the fruit once you have it at home

After purchasing fresh peaches, plums or nectarines at the grocery store, do not eat them and do not put them in the refrigerator until they are ripe.

The fruit looks nice in a basket or bowl on the countertop or table, or it can be placed inside a paper bag. It is ripe when it smells sweet and fruity and yields slightly to the touch. The fruit can then either be eaten or placed in the refrigerator to be eaten in the next few days.

Putting fruit in the refrigerator before it is ripe exposes it to the "killing zone," temperatures between 36 and 50 degrees, which stops the ripening process and ruins the fruit.

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