PHOTO BY ROCCO LAURIENZO

ROD FARROW: "Predictive models that help growers identify the best fruit for storage can mean tens of thousands of dollars per acre to the New York apple industry."

Predicting Honeycrisp's storage crunch with tools

BY **KARA LYNN DUNN**

ROD Farrow has been able to quickly market his Honeycrisp apples after harvest. But this Waterport, N.Y., grower sees the day coming when the highly popular variety will require improved ability to store well. "We haven't yet had to hold Honeycrisp beyond the Christmas season. But about two years ago, the industry began producing more than the market immediately demands," notes Farrow. "So the need to know how to store these apples well becomes more and more important."

Farrow grows nearly 500 acres of apples wholesaled from Lamont Fruit Farm's packing and controlled-atmosphere storage facilities.

"Honeycrisp represents the best op-

Key Points

- Honeycrisp storage research proves critical to apple industry.
- Predictive models help stem losses of as much as $14,000 an acre.
- Consumer demand supports longer-term storage evaluation.

portunity for profitability. It has a potential farm-gate value of $25 to $30 per bushel compared to $8 to $10 a bushel for other varieties," he says.

"But that value can be completely lost in storage," he adds. "It's the most difficult apple to manage in storage." The culprits: soft scald and bitter pit.

That's why Farrow is participating in a New York Farm Viability Institute-funded project with Cornell University horticulturists Chris Watkins and Yosef Al Shoffe

and Research Support Specialist Jackie Nock. They're developing predictive models for Honeycrisp's soft scald and bitter pit storage disorders.

And the remedies are …

The predictive models aim to help growers change orchard practices and storage management to allow conditioning of Honeycrisp and to reduce risk of both, explains Watkins, director of Cornell Cooperative Extension. Because development of both disorders in storage apples is erratic, "the industry may be selling fruit earlier than necessary in order to avoid storage losses," he adds.

Soft scald causes patches of skin to die and is sometimes associated with the browning of interior flesh. It usually starts developing in unconditioned fruit

after two months in storage. Conditioning apples to cooler temperatures at 50 degrees F for seven days before storing at 38 degrees helps prevent soft scald but increases bitter pit risk.

Bitter pit, related in part to low calcium content in the fruit out in the orchard, usually develops and levels off within the first month of storage. It appears as small spots or pitting on the apple skin. A 50% loss to bitter pit from 1 acre producing 800 bushels of Honeycrisps can cost as much as $14,000 per year.

"Soft scald can make the fruit totally unmarketable," remarks Farrow. "Preconditioning helps us manage that, but then we face the risk of bitter pit."

To complicate management, those risks change from orchard block to orchard block and year to year, adds the fruit grower. "Apples that stored well last year may not store well this year. Proven predictive models will make a huge difference in reliably knowing which fruit has the best opportunity to store well."

Early warning

This fall, Watkins and colleagues are testing a preliminary model for identifying apples at higher susceptibility for bitter pit. "Results from a mineral-based test would allow growers to adjust crop loads and apply calcium to the next year's crop to reduce that risk," he explains.

Results of an in-development soft scald predictive model are based on ethanol accumulation that appears to increase in stored Honeycrisps before injury occurs. It would alert growers to sell fruit before scald injury develops. "Our ultimate goal is to help growers reduce crop losses in storage and to develop the means for them to also reduce the need to condition apples," Watkins adds.

So far, highly variable results have been recorded in 10 storage facilities participating in the project. That strongly suggests that management decisions must be based on individual unique conditions.

For more details on the predictive models, Watkins can be reached at 607-255-8546 or *chris.watkins@cornell.edu*.

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