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Interview with Paul Koch (Olympic Fruit Company) and Mike Wilcox (Yakima Fruit)

Defect sorting could reduce costs

Pulling out cull apples right after harvest could save the cost of treating, storing, washing, and waxing the fruit.

GERALDINE WARNER

The Washington apple industry must be one of the few that puts every possible input into the product before throwing it away.

Paul Koch, general manager at Olympic Fruit Company in Yakima, Washington, says that's what motivated him to install an electronic internal and external defect sorter. He hoped that by sorting out the culls during presizing, before the fruit was treated with SmartFresh (1-methylcyclopropene), stored, washed, and waxed, it could reduce costs significantly.

"We looked at the industry, and we thought that if you could presize at harvest you could save a lot of cost," he said. In addition, it would speed up the turnover of bins and allow the fruit to be stored on the basis of internal quality.

After installing the equipment, the company switched its focus to using defect sorting mostly as a labor-saving measure, Koch told members of the Washington State Horticultural Association during their annual meeting last December. First, it took time to gain complete faith in the technology. The other issue is that, depending on the quantity and quality of the overall Washington crop, a company might decide during the marketing season to sell U.S. Extra Fancy grade fruit, which allows some fruit with limb rubs. So, it would not want to have thrown them all out at harvest.

But Koch said the company has now upgraded the system, become more comfortable with it, and is looking with renewed interest at the idea of defect sorting after harvest to avoid the expense of treating and storing unmarketable fruit. Presizing and sorting at harvest also means the marketers know exactly what is available for sale.

Hail

The company doesn't have the capacity to presize and sort all the fruit at harvest, so Koch envisions that fruit from growers who historically have high packouts might be placed directly into storage, while lots with a high percentage of culls—such as hail damage—would be sorted.

The infrared technology on Olympic's Greefa system can sort out internal browning, watercore, and shoulder browning on Gala. It can also sort based on sugar, acid, and pressure.
The optical sorter is very effective for external defects, such as pale limb rubs, insect stings, russeting, and some bruising. It can identify old bruises that have discolored and are corked underneath, but is ineffective on new bruises.

"It does have its limitations," he said. "It cannot sort stem splits unless they're very large and exceed the shoulders, so we still have to do that by hand. A lot of the efficiencies we sought to gain with this defect sorter are lost on lots that have a lot of stem splits."

It can sort for pressure within a 1.5-pound range, although it works best in lots where 80 percent of the fruit has good pressure and only 20 percent are soft, rather than the other way around. "We have great difficulty pulling out the 20 percent firm fruit," he said.

The system cannot identify sunburn on bicolored apples, though it can on Granny Smiths. It also has difficulty pulling out Fuji flecking. On the other hand, it has a tendency to identify specks of leaves as defects, so the company has had to add extra brushes on the line to make sure the fruit is totally clean.

"Our biggest fear was jettisoning good fruit," Koch said.

Advanced knowledge

The fact that every lot of apples is different is a challenge because adjustments to the sorting parameters have to be made. Advanced knowledge of the fruit and what kind of cullage there will be is helpful.

Asked if the equipment can distinguish between grades, such as U.S. No. 1, Washington No. 2, and slicer, Koch said with the right operator, the system can sort limb rub by degree of severity. “A good operator can do that. A bad operator can’t.”

Operating the equipment takes a different skill set from most warehouse jobs, Koch said. “We strongly believe in promoting from within in our company, and we’ve been very successful at doing that,” he said, “But with some of this technology, we’re better off pulling in a computer nerd and teaching him about apples versus someone who’s really good about apples and teaching them to run the computer. There’s an aptitude and a constant focus that’s necessary.”

Another challenge is to create efficiencies while also doing the best job for the grower.

“We can pull out every limb rub in the bin very easily,” he said. “However, that’s not in the best interests of the grower. The software allows us to say ‘We want to put 6 percent of the best limb rubs in the box.’ As you perfect the models, you can dial in what you want fairly easily.”

Mike Wilcox, president of Yakima Fruit and Cold Storage in Wapato, Washington, said his company installed a Greefa system a year ago, mainly to reduce labor. “We are virtually sorterless,” he said. “And it’s also kicked up our production per shift.”

The company usually runs 30 days out of 31 without sorters, he said. People at the tray fill lines are responsible for a last look at the fruit, which is no different from in the past, but there is no sorting done on the front end of the commit-to-pack line.

The company uses the external defect sorter on all the fruit. The biggest challenge is sorting out stem splits on Gala because the equipment can’t differentiate well between a stem and a split.

Dark varieties

And while the equipment is good at sorting out defects on light-skinned varieties, it does not work so well with Red Delicious, particularly with dark-colored defects and dark strains. Another problem the company ran into last year was its inability to detect scale on dark varieties.

Wilcox said the amount of good fruit rejected varies by variety. One employee is responsible for looking through the rejected fruit and putting the good fruit back on the line. It’s not usually a huge amount.

The system is capable of internal defect sorting, which is something the company hopes never to need to turn on, Wilcox said. However, last year it proved very effective for sorting out watercore in Red Delicious. Wilcox said they found that it was easier to pull out the 10 to 15 percent that had watercore than to pull out the good fruit from a lot that was mostly watercored.

“If you have massive amounts of internal defects, it’s probably not going to be effective,” he said.

Wilcox said the system will do an excellent job of sizing and color sorting, but to get the most out of it, a curious, independent, and experienced computer operator is essential.

“These machines are not a set-it-and-forget-it type of operation,” he said. “You’re going to be constantly working with different grower lots, and within the lots, constantly tinkering and spending some time on them to get the most out of them.

“These are very, very complex machines,” he stressed. “You will never put the equipment to its full potential unless you have a very experienced and qualified operator. When you make these kinds of investments, you need to consider who’s going to be operating the machine. That can make or break your investment.”

One big advantage of the system is its consistency, he said. “At the end of the day, the package you’re putting out is consistent in size, grade, and defects that are in the box. We can dial that in. We can put a specific percentage of defects in the box that we want to see. This technology has helped us to do that.”

Koch said that for the first couple of years, the company did a detailed analysis comparing the machine’s sorting capability with its hand sorters, who are extremely good.
“The technology is more accurate, especially at every hour of the day,” he said. “We’ve been very pleased.”