

# 'We've still got a lot of inventory to move'

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Traditionally, major year-to-year swings in the hazelnut crop weren't unusual, but these days, additional factors also complicate projections, he said.

Growers are planting new varieties that are resistant to Eastern filber blight but don't have a long track record in terms of yields, Rodakowski said.

"With these new varieties, we don't have that history. They haven't been in the ground long enough," he said.

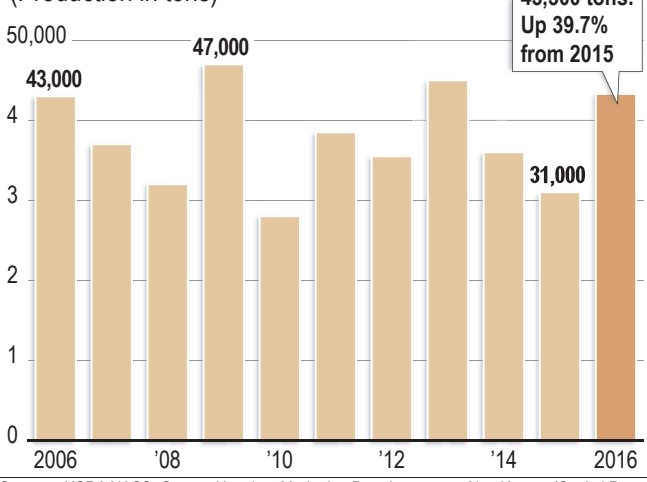
With the larger 2016 crop, packers are also left with more hazelnuts to sell in the new year.

Packers sold about 27,000 tons of the 2016 crop by the end of that year, which is about 2,700 more tons than at the end of 2015.

However, because total production in 2016 was larger, 16,000 tons were left over

## Oregon hazelnut production

(Production in tons)



at the beginning of 2017 — more than twice as much as a year earlier.

"We've still got a lot of inventory to move," said Jeff Fox, CEO of Hazelnut Growers of Oregon, a division of the Wilco cooperative.

"We've got a lot of work to do."

Growers were paid \$1.38 per pound for the 2015 crop, up from the initial prices of \$1.22 quoted by packers early in the harvest season.

The initial price for the

2016 crop is set at \$1.18, but Fox said it's unlikely to rise as dramatically in light of the leftover inventory.

Early hazelnut sales are sold in-shell to the Chinese market, but more of the remaining inventory is headed for the kernel market, where sales aren't as brisk, he said.

Even so, the USDA's estimate for 2016 was expected to be conservative and the industry negotiated the \$1.18 price with the expectation that the crop could be 10 percent larger, said Terry Ross, executive director of the Hazelnut Growers Bargaining Association. "It wasn't a tremendous shock. I expect a respectable increase" in the final price, Ross said. "I think a lot of packers moved product early into the marketplace."

Predicting Oregon's hazelnut production is tougher for USDA these days because

farmers have increased plantings of new cultivars, said Larry George, president of the George Packing Co.

"They were pretty dang close with the old varieties but the new varieties were unpredictable," George said, noting that yields from the Jefferson cultivar surged in 2016.

Estimating the acreage of young hazelnut trees reaching maturity is an inexact science, he said.

Growers surveyed by George Packing had wildly different estimates for the size of the 2016 crop, George said. "The variation people are seeing in their orchards is huge."

Oregon farmers planted more than 9,000 acres of hazelnuts in 2016, up from about 6,000 acres in 2015 and 4,300 acres in 2014, according to Pacific Agricultural Survey, which tracks the industry.

The company relies on aerial photographs taken in

spring or summer, but some orchards were actually planted the previous autumn, said Mike McDaniel, its principal.

For that reason, some trees are better established than estimated in the survey, he said. "There's a decent chunk of trees reaching the bearing age."

Dwayne Bush, a farmer near Eugene, Ore., has found that the popular Jefferson variety is generating a larger amount of hazelnuts at a young age compared to Barcelona, Oregon's traditional cultivar.

At three to four years of age, Jefferson trees are producing as many nuts as Barcelona trees did in their seventh or eighth year, he said.

Estimating the annual harvest is also trickier due to the ongoing removal of older orchards afflicted with blight, Bush said. "It's not an easy job, predicting."

# Pathologist plans to start sampling at Parma, Kimberly and Aberdeen

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or PCR. The instrument amplifies DNA segments, which carry the disease's genetic code, so it can be identified.

Once the disease is identified, farmers can attack it using sprays or other methods before it even appears in their crops.

Woodhall plans to start sampling at the Parma, Kimberly and Aberdeen research and extension centers and said more real-time PCR testing instruments will have to be purchased as the network grows.

In their initial research, Woodhall and his colleagues will evaluate the timing, density and conditions under which pathogens are confirmed through spore sampling and correlate the data with disease prevalence in nearby fields.

Woodhall explained that the spore sampling network is just one piece of a broader vision to upgrade the university's Parma-based plant disease diagnostics laboratory. He's also working to develop new tests using the latest diagnostic tools to more quickly, efficiently and accurately identify crop diseases found in fields. He intends to set up insect traps with the spore samplers to provide a "one-stop shop" for identifying crop threats. Many insects also spread crop diseases.

"The time is right to use this technology," Woodhall said. "We can really provide some solutions to the issues farmers are facing."

## A proactive approach

University of Idaho Extension cereals pathologist Juliet Marshall now has to take a wait-and-see approach to alerting growers about disease threats.

Only when cereal diseases such as Fusarium headblight and stripe rust appear and start to damage crops can Marshall send "pest alerts" to farmers.

But she knows those diseases may incubate for weeks before the first symptoms appear. That's why she's requested funding from Idaho's wheat and barley commissions to collaborate on Woodhall's spore sampling project. Her plan is to correlate wind-blown spore loads captured by spore samplers with the infection rates of dif-

## Possible pathogens detected with spore traps, by commodity

Commodity	Commission/organization	Pathogens tested	Notes
Potato	Idaho Potato Commission	Late blight, Early blight, Gray mold, White mold, Stem canker/white collar	Proposal submitted
Barley	Idaho Barley Commission	Yellow rust, Fusarium head blight, Net blotch	Proposal drafted for this year
Wheat	Idaho Wheat Commission	Yellow rust, Fusarium head blight, Powdery mildew	Proposal drafted for this year
Sugar beet	Snake River Sugar beet Research and Seed Alliance	Cercospora blight, Powdery mildew	Through to full proposal stage
Bean	Idaho Bean Commission	White mold, Alternaria blight	N/A
Onion	Idaho Eastern Oregon Onion Committee	Neck rot, Internal dry scale	A spore sampler has been purchased; block grant is funding some spore trapping
Oilseed	Idaho Oilseed Commission	White mold, Phoma stem canker/Black leg, Alternaria, White leaf spot	Black leg not widely present in Idaho but could spread
Hops	Idaho Hop Commission, Idaho Hop Growers Assn.	Powdery mildew, Downy mildew	N/A
Grapes	Idaho Wine Commission	Powdery mildew, Downy mildew, Trunk diseases	N/A

Source: James Woodhall, University of Idaho Parma Research & Extension Center

Capital Press graphic

ferent barley and wheat varieties.

"We need to validate the data in environmental conditions to develop a predictive model for our growers," Marshall said. "We have to have proof that what we're seeing is the threshold to spray."

Marshall said malting companies have no tolerance for barley with the don toxin, which is produced by headblight, and some varieties of winter wheat are so susceptible to stripe rust that infection can be widespread from the moment it's detected using normal means.

"A lot of it is reactive diagnosis. Somebody has got a problem and we diagnose what it is and help control it," Woodhall added. "My research is trying to stop that and try to do preventative diagnosis."

Jeff Miller, president and CEO of Rupert, Idaho-based Miller Research, also sees the potential for spore samplers to save growers money on fungicide applications for late blight, a destructive fungal pathogen. He explained that growers sometimes spray for the disease when cool and wet conditions surface that favor it, but the pathogen may not even be present.

Miller also said spore samplers could miss late blight

if they're not in the right location. He'd be interested in testing a spore sampler to gauge its usefulness in early detection of late blight.

Miller said older-model spore samplers that capture spores on tape for visual diagnosis have been used to survey for early blight, but that disease proved to be so ubiquitous that spraying at a certain time of year became the best precaution.

The onion industry contributed one of the spore samplers that will be used in a research project funded with \$125,000 from USDA's Specialty Crop Research Initiative. It focuses on Fusarium proliferatum, a fungal pathogen that causes bulb rot. UI plant pathologist Brenda Schroeder, a collaborator in the project, explained the disease first surfaced as a threat to stored Pacific Northwest onions in 2014 and 2015. Bulbs from the 2016 season have not shown rot.

"We couldn't tell the industry anything about it because we didn't know anything about it," Schroeder said.

Schroeder's work will determine how temperature impacts the pathogen. The researchers will also investigate sources of the pathogen. Woodhall will use his spore samplers to test if corn is a host and contributes to the

problem, and to better understand the relationship between airborne spore loads and infection.

## Viticulture's success

Grape growers in Oregon's Willamette Valley typically spray their vines for powdery mildew at one- to two-week intervals, depending on disease pressure in the field.

A few growers in the region, however, significantly reduced their fungicide applications in 2016 without repercussions, thanks to a network of spore samplers deployed by Amy Peetz of Revolution Crop Consultants of Albany, Ore.

"Where this science comes in spectacularly is it takes seven to 10 days for spores to germinate and signs of disease to become visible," Peetz explained. "This gives growers a seven- to 10-day jump on protecting plants against disease."

Peetz researched spore samplers in hops as a graduate student under Walter Mahaffee, a USDA Agricultural Research Service plant pathologist who is also on the Oregon State University faculty. Mahaffee started studying spore samplers in viticulture and hops in 2002, along with Gary Grove of Washington State University.



Courtesy of Walter Mahaffee

Walter Mahaffee, a plant pathologist with USDA Agricultural Research Service and Oregon State University, and Lindsey Thiessen, a former graduate student who now is an assistant professor at North Carolina State University, conduct spore sampling for powdery mildew at Westmount Vineyard near Monmouth, Ore., in 2015.

"Over the last eight to nine years that we've tested it out in the field, the (grape) growers have saved somewhere between two and four applications per year," Mahaffee said, adding that the Oregon Wine Board estimates spore sampling saves growers \$1 million to \$2 million annually.

He's also helped Coastal Viticulture Consultants in Northern California set up spore trapping for powdery mildew.

Mahaffee believes the technology is just now coming of age on a broader scale, but it won't be effective in every situation.

"It's hard to say where it will and won't be useful," Mahaffee said. "There's a lot that has to go into considering the utility of an approach like this."

Rubella Goswami, a plant pathologist with the National Plant Diagnostic Network, explained spore sampling has been practiced for a long time, especially in epidemiological studies such as tracking how some rust spores migrated from South America to North America. But it's becoming more popular due to advancements in technology, and is increasingly being used to forecast diseases.

She knows of recent U.S. spore sampling projects involving downy mildew in spinach and wheat and soybean rust.

"It's becoming more popular in the sense that it's becoming easier to do, and more accurate," Goswami said.

## Better diagnostics

After the economy took a nosedive in 2008, the University of Idaho considered closing its Parma Research and Extension Center. But the industry helped keep it open, and there's been a dramatic change in outlook for the facility.

Mark McGuire, director of the Idaho Agricultural Experiment Station, said the university is drafting preliminary designs and cost estimates to consolidate a few old buildings in Parma into a single, modern research facility. The structure would house nematology, the fruit program, entomology and plant pathology, including Woodhall's revamped diagnostics lab.

"James is demonstrating to a variety of the plant industries there would be value in setting up this spore sampling," McGuire said.

In addition to spore sampling, Woodhall will focus on improving disease testing methods. For example, he's developing new ways to detect diseases using loop-mediated isothermal amplification — or LAMP.

LAMP is far cheaper, faster and more convenient than the PCR technology.

Woodhall and UI Extension potato pathologist Phillip Wharton will prioritize developing LAMP tests to detect potato diseases, including ring rot, phythium leak and zebra chip. They've already developed a better late blight test and have a test for verticillium wilt and early blight in the pipeline. Furthering the science of LAMP is also a top priority at other Northwest institutions.

At Oregon State University, several new LAMP tests have also been developed recently, said Melodie Putnam, director of the university's Plant Clinic in Corvallis. She said LAMP has been especially useful in testing for an important pathogen of herbaceous ornamentals, as well as for detecting fire blight in fruit trees.

The result of their research, Woodhall believes, will be a cost-effective, easy-to-use early warning system for growers of many types of crops.

# Taylor says she's learning about history of genetically modified bentgrass



Alan Kenaga/Capital Press

New Oregon Department of Agriculture Director Alexis Taylor, left, speaks to the Capital Press Board of Directors and managers Jan. 27 in Salem, Ore., as department communications director Bruce Pokarney looks on.

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The Oregon Department of Agriculture has strived to strengthen the state's trade connections, particularly in Asia, and these ties will be vital for the state's farm industry, she said.

In the next 20 years, about two-thirds of the world's middle class will be in Asia, Taylor said.

Climate change is another concern for Oregon agriculture because of longer fire seasons and changes in the life cycles of pests and diseases, she said.

"It's not just Oregon or the United States. It takes the whole world to figure that out," Taylor said.

As for Oregon-specific issues, Taylor said she's been directed by Gov. Kate Brown to find ways to involve farmers in the "Regional Solutions" economic development effort that focuses on local projects.

Taylor also said she's learning about the history of genetically modified "Roundup Ready" creeping bentgrass, a variety that's resistant to glyphosate herbicides and escaped field trials more than a decade ago.

The ODA's previous director, Katy Coda, argued that the biotech cultivar should continue to be regulated by USDA, but the federal agency nonetheless recently deregulated it.

Taylor said she's still "trying to wrap my arms around" the situation and how ODA will respond to the decision.

As for the controversy over genetic engineering in general, Taylor said she subscribes to her predecessor's philosophy of encouraging coexistence among different types of agriculture.

Fewer people now have a direct connection to farming as the industry's grown more efficient, so it's important to educate consumers about modern agriculture, she said.

"That's part of the job for me, being an advocate for farmers and rural communities," Taylor said.