

Test results come off farmers’ bottom line

NUMBERS from Page 1

time dealing with the vagaries of low falling number tests that are used by the industry to find sprout damage that robs wheat of its starch.

“How’s it going to affect my bottom line?” is what goes through my head,” he said. “Frustration, especially this year, when you get the test results back and the test weight’s great, the protein’s great. It’s great quality, except for the falling number.”

‘Devastating’

Cloninger is not alone in his frustrations this year. Many wheat farmers were caught off guard by falling number tests when they harvested what appeared to be a bin-busting, high-quality crop.

But 42 percent of the samples tested by the Washington Department of Agriculture had low falling numbers. Low test numbers were also found in about 25 percent of the Northern Idaho wheat crop and a small percentage of the Oregon crop.

Low falling number test results come right off farmers’ bottom lines.

Instead of the market price of more than \$4 a bushel, some farmers received as low as \$2 per bushel, Washington Association of Wheat Growers executive director Michelle Hennings said in September.

Some elevators dock 1 cent for every point below 300, so 299 would be a 1 cent per bushel discount.

Other elevators discount by the quarter, so wheat with a falling number of 299 would be docked 25 cents per bushel, the same as wheat with a falling number of 276, according to the Washington Grain Commission.

The total financial impact of the falling number problem is unclear, said commission CEO Glen Squires. This year’s wheat crop is still being marketed, with 60 percent of the marketing year remaining.

“Beyond that would just be speculation,” Squires said.

Randy Fortenbery, a Washington State University economics professor, said because the discounts vary, assigning a value to the problem is not possible.

The Washington Department of Agriculture grain inspection program does not routinely collect data on falling number tests, so the percentage of the crop impacted in the last 10 to 15 years is not known, spokesman Hector Castro said.

Cloninger was docked 25 cents a bushel on roughly 20 percent of his total wheat crop. He estimates he lost \$35,000 to \$40,000 because of the falling number test results.

Record yields helped put him at or near his cost of production, but that meant yield-based crop insurance wouldn’t provide him with any relief.

“The crappy thing is, last year was a horrible year,” he said. “It was a drought. With the yields, (this year’s crop) would have made up

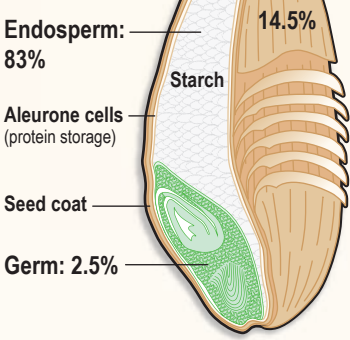
FALLING NUMBER falling prices

A test designed to measure the starch damage created by pre-harvest sprouting of wheat kernels can determine a harvest’s value, affecting the farmer’s bottom line.

The problem

Pre-harvest sprouting occurs when wet conditions delay harvest. Water imbibition in the wheat kernel causes enzyme activity that breaks down starches and proteins, resulting in reduced grain quality and yield. The falling number test measures the effect of the enzymes on wheat quality in flour or meal.

Anatomy of a kernel of wheat



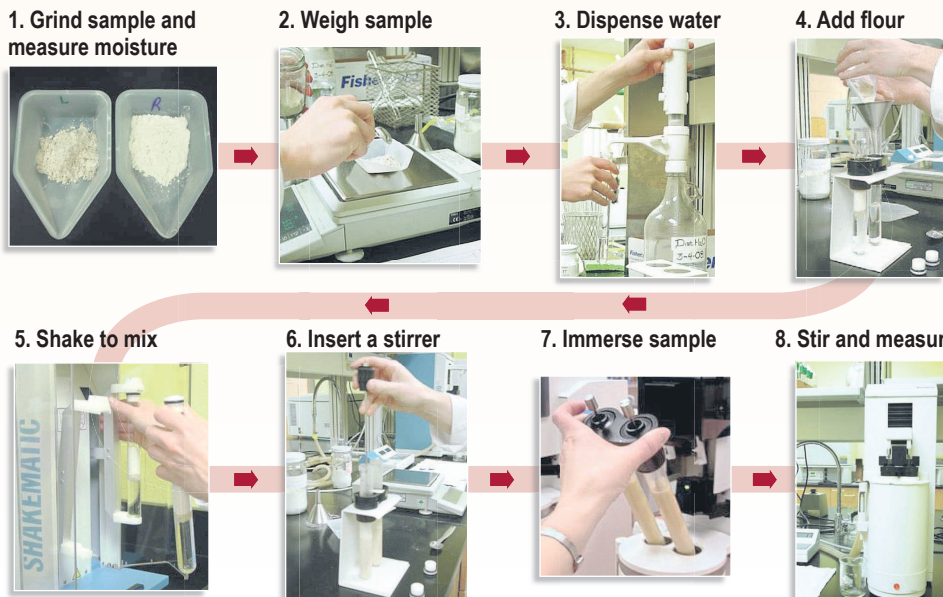
Composition of flour

Starch*	70-75%
Water	13-14%
Proteins	9-14%
Pentosans	<2%
Fat	<1%
Ash	<1%

*Starch is an essential component of flour that determines the quality of baked goods and pastas.

The test

Developed in the 1960s, the falling number test is a standardized method approved by the International Association of Cereal Science and Technology and the International Organization for Standardization.



The formula — 5-second stand + 55-second stirring + Time taken to fall in seconds
(The test measures the time it takes for a “paddle” to fall through the slurry made from a test sample. For example, a falling number (FN) of 300 = (5-second stand + 55-second stir + 240-second fall time.)

Why it matters

Flour with a low falling number can produce poor quality bread, pasta and noodles.

In bread ...



... some enzyme activity in flour is beneficial since it enhances yeast fermentation. Too much activity generates higher sugar levels, resulting in sticky dough, dark crumb and crust color, coarser crumb, and sticky texture.

In pasta and noodles ...



... made with low FN flour, the final product is fragile, soft and mushy. More starch is lost to cooking water, making it cloudy. Production issues include uneven extrusion, strand stretching, and drying irregularities.

Source: USDA ARS, Soft Wheat Quality Laboratory

Alan Kenaga/Capital Press

for last year, but with the falling number, it didn’t.”

The impact can be a financial body blow to a farmer.

Andrew Ross, a professor of crop and soil science and food science at Oregon State University, has been working on falling number-related issues since 1984.

“It’s a financially devastating problem when it happens to growers,” Ross said. “I’ve watched grown men weep in the cabs of their trucks.”

What happened?

Researchers are working to identify the cause of the sprout damage and how to avoid it in the future.

Wheat is susceptible to damage during grain maturation, about 26 to 30 days after

shedding pollen. Cool, rainy conditions start pre-harvest sprouting, causing the enzyme alpha amylase to form. Large swings in temperatures can also cause it to form.

This year, rain that fell July 9-12 around the Davenport, Wash., area was probably a big source of the region’s falling number problem, said Arron Carter, Washington State University winter wheat breeder. Not all wheat was impacted because the crops were at different stages of maturity, Carter said.

“There were lots of rain events this year across the state, and lots of temperature fluctuations, so it is hard to point to one event and say this was the cause of everything,” he said. “In the same region,

some were affected by rain, and others by temperatures. This is part of what is making understanding the phenomenon so difficult.”

What is it?

Sprouting produces large amounts of alpha amylase, damaging the starch and destroying the wheat’s baking and pasta quality. About 75 percent of flour is starch.

Noodles, pasta, breads and cakes made from wheat flour with a low falling number will be poor quality. For export customers such as Japan and South Korea, quality is crucial.

To perform the falling number test, a technician makes “gravy” out of a flour sample and uses a falling pad-



Matthew Weaver/Capital Press
Washington State University winter wheat breeder Arron Carter says no variety will necessarily withstand days of rain without sprouting.

dle to test how thick it is, measuring the number of seconds it takes for the paddle to fall through the gelatinized starch.

When the falling number is below 300 seconds, the alpha amylase enzyme is active and has damaged the starch.

Test uncertainty

A single sprouted kernel of wheat can lower the test score for an entire sample, said Ross, the OSU professor. But the variability doesn’t end there. Each seed in a sample could be a little sprouted, Ross said, or a few seeds could be badly sprouted in a sample of mostly good grain, and both samples could have the same falling number test result.

How sprouted grain is distributed in a field, truckload or silo adds more uncertainty, he said.

When farmers say they’re having their grain re-tested, they’re actually having another test run on a different sample of the crop, since the original grain that was tested was destroyed in the process, he said.

“It would be lovely if we had a non-destructive test,” Ross said. “Maybe that’s what needs to happen.”

Ross was on a 1984 team whose goal was to replace the falling number test machine. But even with new instruments and a more precise viscometer with low variability, the amount of uncertainty was reduced by only 1 percent, he said.

“You may not be able to get more precise than that,” he said. “That’s the ugly reality of it.”

Progress made

Cathy Wilson, the director of research collaboration at the Idaho Wheat Commission, believes new tests are needed.

The old test, developed in the 1960s, doesn’t measure the amount of alpha amylase, she said. A small amount of the enzyme is needed in the grain.

Nor does it consider new knowledge about molecular interactions and chemistries within the wheat kernel.

Sending wheat to feed animals because of damaged starch when in fact the starch isn’t damaged loses value for everyone, Wilson said.

The test is too simple for the things the industry is asking it to do, and is being used

in ways it was never intended to be used, she said.

For example, she said, the test was originally designed to confirm sprouting problems after rain during harvest, but in the 2000s overseas customers began using it as a risk management tool.

At least two other tests are needed — to find damaged starch and to find genetic markers to distinguish between the amount of alpha amylase that is beneficial and the amount that is harmful, Wilson said.

She estimates it will be 10 years before new tests are ready.

“We don’t have the science to get a good test,” she said. “But we can get the science.”

But developing a new test is a tall order, some others said.

“People have been working on it for a long time,” Ross said. “If it were an easy problem to solve, then it would have been solved.”

The USDA Agricultural Research Service needs to “elevate this issue to the highest research priority they can give it, so funds can be made available to address this problem the way it needs to be addressed,” Dana Herron, a member of the Washington Grain Commission, said.

Washington’s wheat grower association and the state grain commission will meet with USDA ARS representatives this month, he said.

The best thing wheat commissions can do for growers right now is provide a tool to help elevators quickly segregate wheat with low falling number from the good wheat to minimize losses, Herron said.

“(They) need a tool that in five minutes or less they can determine whether there’s a falling number problem or not,” he said. “Then they can put the good wheat in the good bin, the bad wheat in the bad bin.”

Private sector research companies tell Herron that such a solution is not far off. He’s been told the technology will be available in 24 months, he said.

Outlook for 2017

Carter, the WSU winter wheat breeder, said it’s hard to offer farmers advice on varieties because falling number problems are caused in part by environmental conditions.

“I can give you a variety that appears to be resilient and tolerant, but if it rains at harvest for three days, I don’t know that it mattered for any variety you have growing in the field,” he said.

Farmer Jake Cloninger said falling number susceptibility is now roughly 30 percent of his decision when it comes to choosing which wheat varieties to plant. This fall he planted a mixture of varieties, hoping to reduce his chances for problems.

After two bad years in a row, 2017’s crop needs to produce above-average yields with prices above \$5 per bushel, Cloninger said.

What happens if he has another bad year?

“I don’t know,” Cloninger said. “It’s kind of unknown.”

EPA will have 30 days to preview plans

GRANT from Page 1

Dennis McLerran, stated in a letter in May to a lawmaker that the agency couldn’t control the grant-funded campaign. The EPA did, however, sever ties with What’s Upstream when confronted on the national level by angry federal lawmakers.

Moving forward, the EPA will have 30 days to preview plans by individual tribes and also require projects to be peer reviewed, according to the agency’s agreement with the fisheries commission. The stipulations were not in the \$18 million grant agreement the EPA signed with the fisheries commission in late 2010.

The EPA has always intended for its grants to foster cooperation between tribes and other groups, an agency spokesman said. The new agreement is more explicit, he said.

The preview of projects addresses “internal and congressional concerns and provide more clarity on the collaborative nature of the

program and the ability to proactively intervene,” the EPA spokesman said in an email.

The EPA and fisheries commission signed the agreement Sept. 30. It was made available last week at the request of the Capital Press.

The EPA’s new award comes as the agency’s Office of Inspector General is still auditing whether the fisheries commission and Swinomish tribe misappropriated the 2010 grant to lobby lawmakers. The audit is in progress, an EPA official said Wednesday.

The Swinomish tribe used approximately \$655,000 on What’s Upstream, which involved several environmental groups and Seattle lobbying and PR firm Strategies 360.

The tribe’s environmental policy director Larry Wasserman rebuffed requests by the EPA that he let the state Department of Ecology review claims posted on the group’s website about agriculture’s contribution to water pollution.

The new cooperative agreement will require tribes to submit technical reports for review before releasing them.

The 30-day preview by the EPA of tribal plans will “ensure consistency with the collaborative intent of the National Estuary Program,” according to the cooperative agreement.

Congress established the non-regulatory National Estuary Program in 1987 to encourage state and federal agencies, tribes and other groups to work together to improve water quality in 28 estuaries across the country.

The fisheries commission will solicit project proposals and distribute the money equally among tribes, according to its application for the grant.

An inspector general’s report in 2014 said EPA should tighten oversight over Puget Sound restoration grants because federal funds were at risk of being wasted. Regional administrators disagreed with that finding.

‘It is a very tough rule for small business people to understand’

PAY from Page 1

Obama could seek an expedited appeal or leave the issue for Trump. Congressional Republicans also could overturn the rule.

“It’s a big victory for small business owners,” Fazio said of Mazant’s Nov. 22 ruling.

Fazio said government-mandated wage and hour laws are not needed in the 21st Century, make it impossible for people to innovate and drain resources from employers that could be used for productive purposes.

“In some cases agricultural employers don’t pay time-and-a-half for overtime, but the regulation still would have applied. It would have made it harder to run a company, period,” he said.

Small business representatives said it gives small businesses breathing room and that the rule would increase labor costs and force employers to demote managers to

hourly employees, hurting morale.

Work advocates said the rule would help ensure administrative employers are fairly paid for extra hours.

In recent months, thousands of businesses have changed staffing. Some raised salaries to the new threshold to avoid overtime costs. Others prepared to change salaried employees to hourly workers, in some cases cutting base pay to offset overtime pay.

Fazio advised his membership who have increased managerial salaries or who have reclassified employees to hourly status to leave those decisions in place. He said it’s hard to take something away from someone once it’s granted.

“It is a very tough rule for small business people to understand,” Fazio said. “In Washington and Oregon, the federal rule is on top of the recent minimum wage rules, which increases complexity.”