

Crop rotation and oat quality

BY NICK OHDE

RECENT USDA reports show farm income will continue to decline in 2016, due to low commodity prices caused by lower global demand and recent bumper crops of corn and soybeans. According to Alejandro Plastina, ag economist at Iowa State University, costs of production are also declining, but at a rate slower than commodity prices and farm income. So how can farmers maintain profitability with \$3 corn?

Many members of Practical Farmers of Iowa have been looking to decrease input costs by adding a third crop to their corn and soybean rotations. About 80 farmers from around the state attended a “short course” in late January hosted by PFI to better understand how to produce profitable small grains.

Matt Liebman, an ISU agronomist, has been conducting long-term research at ISU’s Marsden Research Farm comparing two-, three- and four-year rotations.

“As an agronomist, one thing that’s extremely striking is that data sets from all over the world indicate crops grown in short rotations or monocultures lose much of their yield potential,” he says.

Same result for Iowa

Liebman’s research confirms those findings are true for Iowa, as well. He’s found that adding an additional year of small grains and clover, or multiple years of alfalfa can be profitable, because although corn is grown less often in the rotation, it yields higher and costs less to produce

when it is grown.

The lower costs of production are largely due to the addition of nitrogen-fixing legumes, such as clover or alfalfa, to a rotation, which reduces fertilizer purchases. But the increases in yield come from the additional effects that growing a diversity of different types of crops have on the physical, chemical and biological characteristics of the soil, Liebman says.

In addition to introducing more diverse crops to a rotation, he says the addition of manure also plays a role. In his research, the three- and four-year rotations have composted manure applied, while the two-year rotation only receives commercial fertilizer. He says there are important soil quality and nutrient availability effects that likely derive from manure.

Oats produced for food

Taking advantage of a longer rotation depends at least somewhat on having a market for the small-grain crop. In Iowa, oats are the most likely candidate to add to a corn and soybean rotation. For producers with livestock, many opportunities exist for feeding oats at various stages of maturity and quality. But for purely row-crop farmers looking to sell food-grade oats, quality is equally important to quantity.

Bruce Roskens, director of crop science at Grain Millers, has worked with oat millers and growers for nearly 40 years, first with Quaker Oats and now with Grain Millers.

He says the most important thing to remember when it comes to profitability

Oat quality specification identified by oat millers	
Constituent	Limit
Test weight	≥ 38 lbs./bu.
Groats	≥ 65%
Thins	≤ 12%
Beta glucan concentration	≥ 4.8%
Fat concentration	≤ 8%

Practical Farmers of Iowa surveyed millers to understand the quality characteristics they look for in oats. A few of the most important parameters are listed here.

in selling oats to food processors is that you are producing a food product.

“Farmers raise a crop, and as a grain buyer, we buy an ingredient. “Everything we buy is intended to go into somebody’s mouth,” Roskens says.

Roskens explains that when it comes to oat production, most food- and feed-grade millers want more groat and less hull. The hull is primarily cellulosic material that has lesser food and feed value.

“The average oat variety out there today has somewhere between 68% to 72% groat by weight and about 20% to 25% hull,” Roskens says, “but varieties vary in that. And as a grower, you need to understand this because it can affect your test weight.”

Roskens says one of the most important milling characteristics of oats for Grain Millers is how easy the hull comes off: “When you can’t get the hull off the oat, and you end up breaking that groat up, you can’t make as many flakes. To a miller like General Mills, who’s only interested in making flour for, say, Cheerios, they don’t care if the groat is broken up.”

“But for a Quaker Oats or a Grain Millers or a LaCrosse Milling, where we’re trying to make flakes for cereal

bars and oatmeal, if you break the groat up, it ends up going to flour, and that’s a loss of what we refer to as ‘mill yield.’”

Grain Millers has a list of preferred and acceptable varieties of oats that exhibit good milling qualities for making rolled oats, notes Roskens.

More information online

You can find that information as well as Grain Millers’ oat purchasing specifications in Roskens’ presentation from PFI’s short course on small-grain production in January. All the presentations, including Roskens’ and Matt Liebman’s, are available at Practical Farmers of Iowa’s Small Grains webpage at practicalfarmers.org/small-grains.

PFI and ISU have been evaluating many of these varieties for their performance on many characteristics important for oat millers. See the table above for more information. The most recent update of these oats variety trials is available at practicalfarmers.org/farmer-knowledge/research-reports/2015/oat-variety-and-fungicide-trials.

Ohde is research and media coordinator for Practical Farmers of Iowa.

High test weights require timely harvest, cleaning and storage

DARREN Fehr has been raising organic oats near Mallard in northwest Iowa for over 18 years. He says harvest, cleaning and storage are all crucial elements in producing high-yield, high-test-weight grain. “My situation is I’m growing for Grain Millers. That’s my market, so I’m trying to make sure I meet that spec,” he says.

As identified in the PFI and ISU oats variety trial, test weight is often the most difficult spec to make, so Fehr pays close attention to that. “When I start combining, I’m out there collecting oat samples, weighing them up, trying to

figure out what the test weight is early on in the harvest period, and I make sure I have my fan speeds on the combine set where I want them.” He says he usually errs on the side of higher fan speeds to ensure a higher test weight.

Fehr has harvested by using direct combining, and he’s also harvested by swathing the oats. He says there are advantages and disadvantages to both methods. He currently direct-combines oats: “I think I pick up a little extra yield,” he says, “but I may give up a little test weight so I might have to change my fan speeds a little bit more.”

When it comes to storage, Fehr has a continuous-flow dryer, and he says that makes it easier to dry direct-combined oats (which are typically higher in moisture). He’s shooting for 12.5% to 13% moisture content when he delivers oats to Grain Millers. “Even though the oats are coming directly from the field, I just run a little low heat on them,” he says. “I blow them through an air system, and I have cyclones on top of my bins, so I can actually blow out any little chaff or any bugs and that sort of thing.”

Fehr advises also cleaning the oats on the way out of the bin: “I prefer to vac

them when I pull oats out of the bins and put them in the trucks for two reasons. One, I think you pick up test weight, and the other is you can blow out any live insects.” Both Roskens and Fehr agree the final step is important, as Grain Millers has a zero tolerance for live insects.

Fehr says growing small grains is a constant learning process. Even though he’s been farming for a long time, he still feels like “kind of a newbie.” He adds, “We do some things really well, and some things we don’t do so very well, and we hope to learn from both of those experiences.”