

Sharing a Passion for Grains

By Amy Halloran

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A NOFA-NY Field Day focuses on critical management challenges in food-grade wheat production.

“They called me a ‘master’ in the [program] description, but I’ve just made way more mistakes than you have,” said Thor Oechsner, introducing himself at a NOFA-NY Field Day at Oechsner Farms in late June. “Mistakes are sometimes better teachers than someone telling you what to do. I’m just scratching the surface of what I know and need to know.”

The day was bright and hot, and 20 people had traveled to Newfield, southwest of Ithaca, to see Thor’s diversified grain operations and learn about value-added grains. Thor farms 600 acres organically, growing wheat, oats, buckwheat, rye, and corn for a variety of markets. His grains travel to New York City’s Breuckelen Distilling and Hot Bread Kitchen, among other places, and stay closer to home for sale as animal feed. Thor is also part owner of two nearby outlets for his grains: Farmer Ground Flour, a mill, and Wide Awake Bakery, a CSA bread operation.

The field day presentation attracted homesteaders and gardeners as well as farmers. One grain farmer said he was trying to get better protein from his wheat. Another came to learn more about the market for wheat. A few vegetable farmers were interested in diversifying by growing grains too. Mei-Ling Horn, a baker with experience using local grains, and her partner, David McClelland, were curious about growing and grinding their own. This summer the couple is trialing quinoa for the Organic Growers’ Research and Information-Sharing Network (OGRIN).

Diversified Production

Standing with the group outside the bay of his farm shop, Thor talked about how land pressure pushed him to diversify from growing grains

solely for animal feed to producing food-grade grains. He rents most of the land he farms. Watching such farmland being sold off for housing, Thor realized that maximizing crop value was essential. He needed to produce a greater return per acre, or else in a few years he wouldn't be able to afford to rent land.

"Ignorance has helped me along because I was too dumb not to try things," Thor said of his blind dive into food markets. For instance, he and farmer Erick Smith, one of his partners in Farmer Ground Flour, thought they could simply put a grain mill in a barn and start grinding. Their stone mill sat idle for years before they found a Cornell graduate who could set up the mill to meet state standards.

Supplying the Wide Awake Bakery has helped the farmers and miller Greg Mol understand what qualities bakers need from flour (and thus, from wheat). The learning also goes in the other direction. Baker Stefan Senders is the mill's tech expert, and when new customers first start using Farmer Ground Flour products, Stefan helps educate those bakers about the details of using flour that doesn't have the consistency they're accustomed to. (Large flour mills can offer a very consistent product through blending.)

"Bakers hate variation," Thor said. "I don't really blame them. We think of our grain more like winemakers think of grapes."

A Topdressing Trial

Thor passed around a small library of samples in plastic bags: Warthog, a type of hard red winter wheat; a Flint hybrid corn, used for polenta; soft white spring wheat; and emmer, spelt, oats, and Danko rye. As attendees examined the seeds, Thor and co-presenter Elizabeth Dyck of OGRIN discussed the advantages of each variety and their fertility and harvest management issues.

Elizabeth described a topdressing trial in progress in a field across the road from the farm shop. The trial compares two types of fertilizer: Chilean nitrate and blood meal. Elizabeth explained that the wheat turned very green after the Chilean nitrate application, but there was no visual effect after applying the blood meal.

Research in conventional wheat production systems has shown that topdressing in the earlier growth stages in stages in the spring may boost yield, and topdressing at later stages may boost protein content.

University of Vermont and University of Maine have researched

topdressing winter wheat, too, and Washington State University has also researched the effect of applying organic forms of nitrogen. A sticky point in this research is that Chilean nitrate may soon not be allowed for organic use; it is scheduled for re-review by the National Organic Standards Board (NOSB) in October. The NOSB has recommended that its use be prohibited because of a concern that dependence on sodium nitrate could lead farmers to put off engaging in soil-building practices, and also because alternatives to Chilean nitrate are now more available than in the past.

Once the wheat is harvested and grain quality assessed, Elizabeth will analyze the data to determine whether topdressing boosted yields or protein and, if so, how the cost of topdressing matches the payout.

Managing the Harvest

Thor and Elizabeth stressed the importance of timely planting and harvesting. Reading the grain's moisture content in the field determines whether the grain is ready for harvest and ready to be stored. Wheat has to be at 13 percent moisture content to store safely.

Aside from hitting the right moment for storage, harvest timing is also important for meeting the needs of bakers and pasta makers, who seek a certain "falling number" to ensure the flour will perform well. Falling number is an indication of sprout damage that occurs in the seed head of a wheat plant if it's wet near harvest. Post-harvest, wheat seed is sent to a lab and ground up and made into a slurry; the speed at which a weight travels through this slurry is the falling number.

"The falling number is a measure of how sprouted the grain is," Thor said. A low falling number, e.g., less than 200 seconds, indicates significant sprouting damage and results in poor-quality grain products such as mushy pasta or bread with poor texture.

Controlling the falling number is a management issue, Thor says, in terms of harvest timing, though luck with weather can also play a role. "As soon as the grain is dry enough to harvest, you harvest it and artificially dry it," said Thor, noting that this year was so dry he probably wouldn't need to do any post-harvest drying. "If it looked like we were going into four days of rain and the grain was too wet to store, I would [still] harvest it. Especially white wheat, which sprouts at the drop of a hat."

A vegetable farmer who grows wheat for his own use commented that he leaves a strip of wheat plants for seed stock in the field a little longer than the seed he harvests for food. "Am I just wasting my time?" he asked.

"Try [sprouting] both and see if the germination rate is different and you'll know," Thor suggested.

Cleaning the Grain

Harvest and post-harvest handling of wheat is critical, and Thor stressed the importance of cleaning the grain. "If you let grain sit with ragweed, you could lose your food," Thor said. "Harvest is a make or break time. You can really lose it at a million different points. So if I can clean the grain every time I move it, why not?"

The field day group viewed the farm's 1910 Sidney air screen cleaner in operation. An auger pulled wheat up from a grain box, and the wheat shook through the screens, rattling. This machine is the last cleaner to handle grain before it leaves the farm.

The combine is the first step in cleaning the grain. During harvest, the seeds are threshed from the heads inside the combine. From the combine, the grain is deposited in a wagon or truck. It is then put through a rotary screen cleaner, also known as a spiral cleaner, and into a bin for storage.

As the crop comes out of the field, Thor and Elizabeth said, you might not see much extraneous material. But once the wheat has passed through the rotary cleaner, you see how much debris it removes, both weed seeds and other non-crop particles.

Another cleaner that might come into play is an indent cleaner, which will remove weed seeds that are the same weight and diameter as a wheat seed, but a different shape. The indent cleaner sorts by shape, whereas the air screen cleaner sorts by size. However, Thor doesn't often run the indent cleaner. Instead, he weeds out vetch and corn cockle in his fields by hand. "It's time consuming [to hand weed]," says Thor, "but running the indent cleaner is *really* time consuming. It's quicker for us to go through and walk the fields." Removing the weeds by hand also prevents them from going to seed and becoming more of a problem in future crops.

Another important problem to guard against in harvested grain is vomitoxin, a toxic contaminant produced by a *Fusarium* fungus. The

USDA allows only one part per million of vomitoxin in the finished product. There are ways to address vomitoxin post-harvest, Elizabeth said, such as using a gravity table—which separates grains according to density, not just size. Millers can blend different crops to reduce the vomitoxin rate overall. A lot of mills, she noted, will not take any grain that has a rate over 1 part per million, however.

Once the grain has been run through the Sidney cleaner, it is put into one of three containers: back into the truck, to be driven to the flour mill; into 1-ton totes, for shipping to various customers; or into 50- or 60-pound bags, for sale to customers.

The tour moved over to the row of grain bins that range in size from 13,000 bushels down to ones that hold just 300 bushels. The seeds for planting next year's wheat crop are stored in separate bins after the initial cleaning in the rotary cleaner.

"These things are my bank accounts," Thor said, standing inside a bin that holds 2,800 bushels. But even in the bin, the grain still needs to be managed properly to prevent problems in terms of moisture and infestation by meal moths. To guard against these pests, after a bin is emptied, Thor brushes down the walls and vacuums thoroughly, then blows a little diatomaceous earth through the bin. This will kill the maggots, but not the mature moths; Thor uses pheromone traps to capture the moths. Fly strips placed nearby catch extra moths.

The next-to-last stop on the field day tour was a visit to a big mistake at a field with a beautiful view. Thor had planted wheat here twice in a row, and he showed how patchy the field was; stem and root rot had killed off areas of plants. He invited people to squeeze the heads to see how they hadn't developed any kernels. Good rotations, he said, are key to avoiding diseases.

The field day ended back where it began: at the shop, with a feast of Wide Awake Bread and local cheeses.

<endline>Writer Amy Halloran lives on half an acre in Troy. After attending Field Day, Amy and her family harvested 1,000 square feet of Warthog wheat with a sickle and scythe.

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Five Wheat-Growing Essentials

The Web site of the Organic Growers' Research and Information-Sharing Network (OGRIN) includes a wealth of helpful information on growing wheat and other grains. The following summary is excerpted from an OGRIN fact sheet about producing high-quality food-grade wheat, written by Elizabeth Dyck and Thor Oechsner. To read the fact sheet in full, go to ogrin.org/essentials_growing_wheat.html.

1. Source and plant high-quality varieties.

Variety matters, not only for yield, but grain quality, Fusarium resistance, and adaptability to our region. Planting seed that is free of disease and uncontaminated by weed seed is also critical.

2. Plant the wheat at an optimal point in the rotation and on suitable ground.

As with any crop that you are intending to market as high-quality, food-grade grain, wheat needs to be grown under optimum conditions. This requires careful planning of when to grow the crop within your rotation and may require that you modify your rotation. Choosing fields with appropriate soil types and background fertility and low weed pressure is also critical.

3. Harvest as soon as possible.

Wheat will not wait! Quality decreases and risk of disease increases the longer wheat stays in the field after physiological maturity.

4. Be prepared to clean, dry, and store the grain.

Food-grade quality must be maintained after harvest through sale of the grain. If moisture content is too high or weed matter is not removed promptly, risk of grain spoilage, increase in vomitoxin content, or development of off-flavors is greatly increased.

5. Research multiple marketing options before planting.

Food-grade wheat and specialty grains vary in value depending on the market. Adding value to the grain through on-farm processing is another option to consider. Also, if weather conditions or other disasters occur to reduce the quality of the grain, be prepared to access other markets. Northeast growers cannot compete with the huge acreages of commodity wheat from the Midwest, Northern Plains, or western Canada. But we can "sell smart," by marketing our wheat as locally grown, value-added grain.