WINTER 2009

NEWS

NORTHERN GRAIN GROWERS ASSOCIATION

To Encourage and Support the Production, Processing, and Marketing of Grains in Vermont and the surrounding areas.

Northern Grain Growers Association

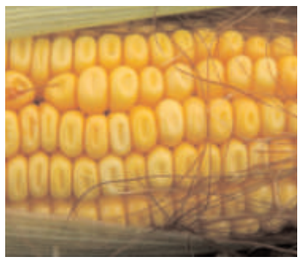
This is the very first edition of the newsletter and it is with great pleasure that the NGGA steering committee is bringing it to you. As most of you know the grain growers in Vermont and surrounding regions have been enjoying gathering together for winter informational meetings as well as farm field days during the cropping season. It has been truly exciting to watch the momentum of this group build over the last few years. This has been a "grass roots" effort in the truest sense of the word. At last winter's conference it was decided by the attendees that the time has come to formalize the group so that even greater networking and outreach can occur. A small steering committee was formed and has been meeting since that time. This group is comprised of grain growers, bakers, researchers, and agronomic specialists. Much of the credit for the existence of this group needs to be given to the combined efforts of the established grain growers and the efforts of Dr. Heather Darby. Heather returned to Vermont after completing her agronomy studies in Oregon and has been truly dedicated to serving the needs of the Vermont farming community. Her willingness to network with the farmers, organize events and conduct relevant research projects has been remarkable.

Early conversations within our group identified the desire to have a regularly published newsletter as an important activity. It is hopeful that contributions will be drawn in from a wide array of individuals. This issue features a report on a recent field trip to a mill in Quebec, an article on corn breeding and research reports from the region. It is our hope that the newsletter will willingly adapt itself to the needs of our group. It is possible that a classified ads section will be a part of the next issue. Please feel free to contact the newsletter editor, Erica Cummings, to add your contributions to this newsletter. You will find contact information for Erica and the steering committee on the last page of this issue. – *Brent Beidler*

Corn Breeding

by Jack Lazor

Public corn breeders are few and far between these days. Margaret Smith of Cornell is probably the last remaining public corn breeder in the Northeast. We were very fortunate that she was able to make two trips to Vermont this past season. Margaret introduced us to the basics of corn breeding last March at our annual grain growers meeting. She focused on the difference between phenotype and genotype. Phenotype refers to the plant's response to its growing environment. A lone plant at the end of a row grown in full sun with plenty of organic fertility might yield a tremendous looking ear, but this characteristic will not necessarily transmit to the next generation. Genotype, on the other hand, refers to the plant's ability to pass genetic traits to subsequent generations. So a healthy, strong stalked plant that yields moderately well and withstands wind, high population, and European corn borer pressure is the ideal candidate for selection. These traits will be passed on to the next generation.



Margaret also emphasized the need to select open pollinated corn seed from as broad and diverse a sampling as possible. She recommended laying a corn field out in quadrants or sub-plots, and hand picking ears from diverse loca-

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tions throughout the entire field. Better yet would be to share and swap seed with other farmers who are growing the same variety. Ears for seed production should be harvested as soon as the corn plant has reached black layer or physiological maturity. Repeated exposure to frost can damage the cell structure of the kernel lowering germ and future vigor.

Margaret made a second trip to Vermont in late September for an "on farm—in the field" workshop on corn breeding. Victor Kucyk, an OP corn breeder and seed producer from Ontario, was also in attendance to offer his perspective. We took our "corn walk" in one of my Early Riser plantings that straddles the border in North Troy. Standability and stalk strength were discussed at length. Victor stated that round stalks were much stronger than elliptical ones. Margaret simply kicked or pushed on the stalk to measure standability. Early Riser has five or six different styles of ears ranging from very orange, hard-textured flint to light yellow dent. Margaret seemed to think it was very important to select all the different types of ears to maintain genetic diversity and avoid inbreeding suppression. Adequate husk coverage and thin ear shanks were also seen as desirable traits.

The 2008 growing season is over. The corn is in the bin and our seed harvest is all cleaned and bagged. We are waiting for the germ test from the seed lab. Having made several forays into wheat and corn breeding, I have come to realize that serious plant breeding and production agriculture are almost mutually exclusive. As a crop farmer, I want to see as much of my harvest as possible make it to the storage bin. I am interested in putting every plant, weak or strong, through the combine. The best thing I can do is to select and hand-pick ears from the most promising plants. In a normally busy harvest season, it can be difficult to pull oneself away from harvesting soybeans or dry beans to walk and select a corn field.

I did one little breeding experiment this past season where I tried crossing the later maturing full seasoned Garland Flint with the very short seasoned Calais Flint. This meant leaving two out of six rows of corn unplanted, and then returning a week or ten days later to hand plant the shorter season variety. This would permit the two varieties to tassel and silk at the same time. The plan was to detassel the Calais Flint so that it would be pollinated by the longer seasoned Garland Flint. Needless to say, we never got to the detasseling stage. Significant genetic progress can only be achieved by putting severe pressure on a variety. The pressure may come from increased plant populations, lower fertility inputs, or the European corn borer. This is where it is hard for a crop farmer to watch 80% of a plot be sacrificed for genetic improvement. Plant breeders have the time and the resources to "put the pressure on" and just take the very best. We, the farmers and the end users of seed can profit from the results of a 20% selection rate. Plant breeding needs the serious devotion of a full-time plant breeder. As farmers, we can be "participatory breeders" by growing, testing, and increasing materials that people like Margaret can provide us.

I would be happy to share any of my more in-depth insights and observations about corn growing, breeding, and seed saving. I'm very interested in the experiences of other growers. Stay in touch.

Our Visit to La Meunerie Milanaise

by Jeffrey Hamelman

On November 17, 2008, a group of Vermonters met at Les Moulins de Soulanges in St-Polycarpe, Quebec. For several years mill owner Robert Beauchemin (who also owns an organic mill, La Meunerie Milanaise, east of Montreal) has been committed to raising wheat varieties in eastern Canada that are suitable for the production of artisan-style breads, as well as in integrating bakers and farmers into the mill relationship. During a visit to the King Arthur Bakery in early autumn, Robert expressed his willingness to share his expertise with farmers in Vermont who are trying to accomplish here what he has been successful in accomplishing to our north. And so a visit to his mill was organized, one that would bring together the kinds of people who have an interest and a need for good bread wheats: farmers, bakers, and crop specialists.

The visit began in the lab room, which also serves as the area where daily bake tests are performed. Moulins de Soulanges uses state of the art rheology equipment to measure a variety of aspects of each wheat sample; for instance, dough extensibility and elasticity, tolerance to mixing, absorption capacity, and amylase activity. Once these tests are performed, a professional baker on staff mixes various doughs with the flour samples to ascertain their potential baking quality.

Following the descriptions of the testing apparatus, Robert and staff agronomist Elisabeth Vachon spoke at length about various agricultural aspects pertaining to the growing of chemical-free bread wheats in our challenging part of the world. They discussed the importance, and inter-relatedness, of soil fertility, cultivar selection, planting density, disease management, and crop rotation. They also stressed the importance of planting as early as possible in the spring in order to minimize weeds. (Elisabeth expounded on frost sowing, where seed is planted during maple sugaring season. Planting occurs through the night, while the ground is frozen. The multiple freeze/thaw cycles at this time of year ensure that there is good soil contact with the wheat seeds.) Density of planting was also identified as an important way to minimize weeds, with 175# of wheat seed per acre being the recommended rate. In a no-till system, Elisabeth advised planting of both red and white clover about two weeks after wheat sowing; the clover grows well once the wheat is harvested and serves as a cover crop so that no fertilizers will be required the following season. By contrast, when fields are harrowed after harvest, more light and air is brought to the soil, allowing more weed germination. Correct harvest timing is of considerable importance both to the farmer (so he doesn't risk losing the crop to sprout damage) and to the baker (who requires wheat that does not have an excess of amylase activity). Late harvesting can have a devastating affect on grain quality.

Robert Beauchemin

The past growing season was used as an example: due to persistent rains in July and August, many Quebec farmers did not harvest their wheat early enough, and the majority of their harvest was not of adequate quality for bread production due to an excess of sprout damage. The farmers who Robert works with, however, enjoyed reasonable harvests of good quality wheat, simply because they did not delay the harvest.

Following these discussions, Robert led us on a tour of the mill itself. We had the opportunity to observe the entire procedure, from the initial tempering process the wheat undergoes prior to milling, right through to pallets of flour bags being mechanically wrapped in plastic wrap.

It's typical of many French mills to have a direct business relationship with both farmers and bakers. Robert follows that model in his connections with Canadian farmers and bakers. Clearly he is doing something right: in 2005 just 600 acres of wheat were farmed specifically for Moulins de Soulanges. This year that number was up to 14,500 acres, and next year Robert expects 25,000 acres to be under contract to his mill. There is success on the baking side as well. Première Moisson is one of the foremost (and largest) bakeries in Montreal, and presently almost 100% of the flour they use comes from Ontario, Quebec, and Gaspé.

Lily Vallières

Growing good bread wheats in Vermont is an idea that is gaining more and more attention. Clearly, an endeavor of this magnitude can only be successful if the needs of both farmers and bakers are understood and met. It's also clear that being successful in Vermont would not simply be a matter of copying and pasting the methods employed by the farmers under contract to Moulins de Soulange. However, many of the subtle aspects of growing good wheats have been worked out by Robert and these farmers, and their expertise could certainly be of benefit to the Vermont undertaking. Although we are not nearly as far along in developing a viable wheat culture in Vermont as are our northern neighbors, it was clear from the visit to Robert's mill that there are enthusiastic people with skill and interest, farmers, bakers, and crop specialists who are willing to work to make this possibility a reality.

University of Vermont Extension - Grain Trials

Dr. Heather Darby, Karen Hills, and Erica Cummings

In 2006 & 2007, winter wheat variety trials were conducted to evaluate yield and winter survival. Canada released varieties were generally the highest yielding and exhibited the best over wintering qualities that we need in Vermont. Washington varieties were not tolerant of our winter climate. However, even with 50% yield loss they still had acceptable yields. Surprisingly, the New York variety had low winter survival rates compared to the Canadian varieties.

Winter Barley did not over winter well in 2007. Triticale and Spelt had some difficulties making it through the winter months as well. This was different than the 2006 winter where spelt and triticale survived 100%.

A spring wheat seeding rate study was conducted in 2008. There are varying seeding rate recommendations available from Washington, New York, and Quebec. The recommended seeding rates range from 90 lbs up to 175 lbs/acre. Four seeding rates (90, 125, 150, 175 lbs/acre) were evaluated to determine what rate would produce

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the highest yields. The 90lb/acre was significantly lower in yield than the 125, 150, and 175 lbs/acre seeding rates. Interestingly, there was no difference in yield between the higher seeding rates.

2008 Soybean Performance Trial Results

Dr. Heather Darby, Karen Hills, and Erica Cummings

In 2008, the University of Vermont Extension conducted a food grade soybean evaluation program at two locations, High Mowing Seeds in Hardwick and Borderview Farm in Alburgh. The purpose of the program was to provide yield comparisons of food-grade soybean varieties suitable for the Vermont climate. Performance trials were established as replicated research trials at these two sites in northern Vermont.

Variety	Moisture %	Yield lbs/acre	Population per acre	Height in.	Pods per plant	Pods inches from soil
06F8	13.3c	1,969	165,833a	36	30	4.2a
Lotus	13.2c	2,153	151,667a	32	26	3.5ab
Ohgata	13.5bc	1,831	106,667b	32	28	2.9b
Venus	14.2ab	1.673	100,000b	32	32	2.9b
10FS	14.3a	1,694	132,500ab	33	31	4.3a

TABLE 1: *Hardwick soybean site yield and plant characteristics*

Yields from the Hardwick site ranged from 1673 to 2153 lbs. to the acre. Lotus was the highest yielding variety and Venus was lowest yielding at this site. The data suggests that varieties with a lower relative maturity rating yielded better at the Hardwick site. However, there was no statistical significance in yield differences among the Hardwick varieties.

Yields at the Alburgh site ranged from 2114 to 3088 lbs to the acre and the differences between varieties were statistically significant. 10F8, Venus, and MN1607 were the highest yielding varieties and 1F16 was the lowest yielding variety. Pod distance from the ground showed differences that were statistically significant as well. The 10F8 and 1F44 had pods that were the furthest from the ground.

The higher the pods are from the ground the less likely it is that soil will be picked up during combining. Dirty beans require time and expense to clean properly for commercial sale. In addition, soil can discolor the beans and render them unfit for sale.

Variety	Moisture %	Yield lbs/acre	Population per acre	Height in.	Pods per plant	Pods inches from soil
Ohgata	15.3	2,579b	136,000ab	40cd	40bc	3.4de
Vinton81	15.4	2,513b	143,000ab	44qb	54a	4.5ab
MN1607	15.6	2,737ab	126,000bc	42bc	46ab	4.4abc
1F44	15.5	2,667b	133,000ab	46a	46ab	4.9a
Venus	15.5	2,785ab	119,000bc	39d	42abc	3.7cde
1F61	15.3	2,114c	98,000c	33e	46ab	2.2f
10F8	15.5	3,088a	162,000a	45a	43abc	5.0a
Nova	15.4	2,561b	140,000ab	40cd	46ab	3.8bcd
Oria	15.7	2,518b	96,000c	38d	38bc	3.6cde
15F8	15.4	2,447bc	114,000bc	32e	32c	2.9ef

TABLE 2: *Alberg soybean site yield and plant characteristics*

Winter Grain Growers Conference

Plan now to attend the upcoming **NGGA Winter Conference** to be held on **March 19, 2009** at the VTC campus in Randolph Center. More details on this event in the next edition.

Mark Your Calendar!

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