Maritime Organic Grains Network Newsletter
Issue Three, Spring 2008

Organic Grain and Oilseed Forum A Success!

Preceding this year's ACORN Conference was the first Organic Grain and Oilseed Forum, which brought together many growers, processors and researchers to help and increase the amount and quality of organic grain in the Maritimes. The presentations for most of the speakers can be found on the ACORN website at: www.acornorganic.org/grainsnetwork.html.

The forum began on Wednesday night (March 5) with information for farmers going into or through the transition to organic.

ACORN Organic Trade Show March 6-8, 2008

Claude Berthélémé, Organic Production Specialist in NB, presented information regarding the standards and certifying bodies that growers would use. Mark Bernard presented a growers perspective of Barnyard Organics, an organic grain farm and soybean roaster on PEI. The farm is still going through transition to become fully certified and uses a computerized record keeping system, Farm Credit Canada's Field Manager Pro.

To end off the evening session Andy Hammermeister, Manager of the OACC, presented an overview of the Organic Grain Trip to Quebec. Andy noted that a) most of the farmers used fresh manure in the farming systems, b) had a clearly defined rotation, c) were growing at least one or two high value crops and d) were diversifying or innovating by exploring new options. Weed control was a challenge, and ridge-till systems with 30-inch rows were common.

The next day Andy Hammermeister and Roger Henry, PEI Organic Dairy Club, talked about cropping rotations and the importance of certain crops in the rotation. Andy explained that having a healthy rotation will help feed and increase the amount of microbes in the soil which provide nutrients available to the crop being grown. When designing a rotation, be sure to alternate between crops with high nutrient demands and those with low nutrient demands, and be sure to avoid growing crops in consecutive years that might host diseases or pests for the following crops. Adding forages into the rotation is an important way of building the soil fertility and biology. We must realize annual weeds are plants that nature has adapted to quickly cover ground that has been disturbed. In agriculture we are frequently disturbing the soil, providing ideal conditions for weeds (and our annual crops) to grow. Weeds can be managed by varying the kinds of crops you are growing and by changing the timing that they may be planted.

Roger has been setting up some different types of rotations and tillage practices in an effort to increase weed control and yields. He has been mainly working with dairy producers who have forage based systems. Roger provided examples of rotations designed for cash crops and for livestock. Growing cover crops such as oilseed radish and green manure crops such as buckwheat can provide very effective weed control while conserving nutrients and making them more available for following crops.

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Inside this Issue:

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If you know someone who would like a copy of this newsletter, please let us know and we'll send a copy to them.

All newsletters are available at www.acornorganic.org/grainsnetwork.html

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The afternoon session featured Sebastian Angers who advises a group of 25 organic field crop farmers in Quebec. Sebastian gave a presentation covering practices that he believes to be the best for organic production. He advises to lime twice a year rather than one large application, which will allow for better absorption into the soil. The timing of weed control operations is very important for effectively removing weeds. He shared a method for knowing the right time for weeding; place a pane glass window face down on top of the field after planting, which will create a greenhouse effect that encourages weeds to grow faster under the glass. This usually gives the farmer two days notice before the optimum timing for weed control. Sebastian likes crimson clover planted at 4 kg/ha and red clover planted at 3kg/ha for a green manure crop. Grain farmers also must realize that when harvesting grain from a field you are also removing phosphorus, and when harvesting clover you are removing potassium. These nutrients being lost should be accounted for and replaced at some point in the rotation.

The second speaker of the afternoon was Tom Manley of Homestead Organics, an organic feed mill in Ontario. Tom presented on quality issues with organic grains, marketing and shed light on the recent upswing in the grain prices. Tom had made a lot of great points that gave farmers in the room a new look at what they were currently doing. One thing was for farmers to stop asking what to grow and start developing a good rotation of crops for their farm and then sell on the basis of what fits in that rotation, what your technical capacity is (e.g. equipment, planting, harvesting, drying, shipping), and then fine tune to market needs and prices.

The quality of organic grain is not just affected by growing conditions; poor post-harvest handling and storage can cause a good organic crop to become unmarketable. Not having proper drying equipment causing molds, or rodent or bird droppings can cause grains that have high bushel weight and good protein to be not suitable for sale. Tom mentioned that farmers need to take more pride in combining their crops to harvest a clean product for sale. Know how to set and adjust your combine to reduce dockage. Dockage is going to cost the farmer; by minimizing it, the end price of grain will be higher.

As for marketing, Tom advised to be careful when signing contracts; know if the contract is a tonnage or best effort basis, gross price or net price, picked up by buyer or delivered by seller. A very important part of marketing product is to establish relationships and to sell close to home. His last word was to buy double certified crops (Organic and CFIA Certified Seed), doing this supports the development of the organic seed industry and shows crop breeders that there is a need for the certain genetics in the crops being grown.

To round out the afternoon a panel discussion was formed with Tom Manley of Homestead Organics, Monique McTeirrnan of New Brunswick Grains Commission, Tony Grant & Richard Wetmore of Speerville Flour Mill. The panel answered questions from the crowd regarding topics from the price of grains to the quality of the outgoing product.

Overall the 2008 Organic Grain and Oilseed Forum was a great success, with great numbers in attendance. Presentations are available on the ACORN website. There were a number of handouts given out during the course of the forum, of which there are extras, so if someone could not attend Mark Bernard could arrange to send the desired information.

We would like to take this opportunity to once again thank our sponsors that help bring this event to reality: New Brunswick Agriculture Council, Agriculture and Agri-Food Canada, EcoCert Canada, and Speerville Flour Mill. In addition there were a number of key people that worked very hard to organize this event: Claude Berthélémé, Andy Hammermeister, Joanna Adams, Andrew Kernohan, and Beth McMahon.

Looking for a farm apprentice?

ACORN has partnered with SOIL to promote organic and/or sustainable farm apprenticeship opportunities. This is a program to help teach a future farmer about sustainable/organic farming, while receiving an extra set of hands for the season.

This program helps match apprentices with farms for season-long opportunities (or longer). The cost to apply is $30 and apprentices also pay $30. Listings appear on the SOIL website, as well as on ACORN's. Further outreach is also provided to attract apprentices to the program.

Start-up funding has been provided by Agriculture and Agri-Food Canada, as well as ADAPT Council and Agri-Futures.

For more information see: www.acornorganic.org/apprenticeship.html

Choosing Pedigreed Seed–Why it's Important to Organic Farmers

By Mark Bernard, Coordinator of the Maritime Organic Grains Network

In addition to being the coordinator of the Maritime Organic Grains Network, I also manage an organic grain farm called Barnyard Organics. In the last edition of this newsletter I advertised soybean as Common Seed but also named the varieties that were planted in 2007. At that time I was not aware of the full law surrounding the Canadian Seed Act. For that I apologize and did not intend on infringing on the Canadian Seed Act and Regulations.

From my experience, I would like to educate the readers on the laws surrounding pedigreed seed and the Canadian Seed Act and why it's important to organic growers. There are two different laws that protect seeds that are grown in Canada. First the Canadian Plant Breeders Rights Act. This act provides protection for scientists or plant breeders that develop new varieties to be sold. Secondly, the Canadian Seed Act which governs over the quality and sale of all registered varieties in Canada.

On August 1, 1990, the Canadian Plant Breeder's Rights Act became law. This law is designed to protect new plant varieties that plant breeders develop. Once a variety is approved a "Grant of Rights" will be issued providing that person with full rights over that variety. Within this law it states that the varieties can only be legally protected up to a period of 18 years. At that time the variety is no longer protected. To get to that point of receiving a "Grant of Rights" requires a lot of time in both a greenhouse and the field setting. Many generations are required to grow out different lines of seeds to prove that the seeds are: new, distinct, uniform and stable. A new variety implies that a variety can't be sold before an application for seed protection is submitted. For the variety to be distinct, the characteristics of the variety must be measurably different from all other varieties that are known to exist. To be uniform, the new variety must show no variation or the variation must be predictable and variations must be acceptable commercially. A stable variety will require to be grown out over a number of generations proving that the description of the variety stay true.

When the variety has been approved, it provides rights and restrictions to the holder of the new variety. The protected seed can be sold in Canada to produce more of the propagated seed. It can be further developed to breed another variety that will someday be commercially available. Also the holder may provide a license for someone else to use the rights of the newly developed seed. This license may or may not have conditions attached to it. Restrictions to the holder's rights include allowing other plant breeders to use protected varieties to develop new plant varieties. Farmer's are also allowed to save and use their own seed of protected varieties without infringing on the holders rights.

The Canadian Seed Act was implemented by the Canadian Food Inspection Agency (CFIA). The CFIA inspects fields that are growing grain to prove purity in the seed. Also they inspect the sale of grain to make sure the sold product is to the specific grade.

To have fields inspected you must first become a member of the Canadian Seed Growers Association and follow the requirements to be a recognized seed grower. The Canadian Seed Act provides legislation over use of variety names, seed testing, sampling seed and grading of seed.

From this overview of the legislation behind growing and developing seed I hope you have a better appreciation for the price of pedigreed seed and benefits to you as a farmer. In addition, since we are organic farmers it is even more important to show our support and our numbers to seed breeders and suppliers. Letting them know that we continually require new varieties to be developed that will benefit regional climatic conditions and provide yields that will make our farms successful and sustainable. As you may look toward provincial tests of soybean and corn to help you make cropping decisions, you will notice a decreasing trend of non-GM varieties. The entries for these tests are sent in by the seed companies and if sales are lower in that region they might decide to enter fewer varieties.

As the Organic Standards now state that we require to source organic seed first, we need to start now and promote and develop the seed dealers so that we will have a secure supply of top quality seeds for years to come.

Buyer and Seller Listings

To post a FREE classified ad in the next newsletter (July) contact: Mark Bernard (902) 439-1182 or (902) 887-3188 or email mbernard@nsac.ca.

OACC Research: Pelletized Poultry Manure for Spring Wheat Production

Note: the following OACC research projects were jointly funded by the provinces of NB, PEI, and NS. Special thanks to the OACC crew, Barnyard Organics and Fox Brand for their support.

Background

Pelletized poultry manure has become available in NB at a cost that may warrant its use in organic production. Organic production of spring wheat in the Maritimes is constrained by yield and protein content. Slow release sources of fertility may improve both of these properties. In research conducted in NS, Beavers (2005, MSc Thesis) found application of pelletized poultry manure (Nutriwave 4-1-1) at rates of approximately 4500 kg ha^{-1} (broadcast and incorporated prior to planting), increased yield and protein content of the spring wheat Helena. The nitrogen release from the Nutriwave extended over several months, and was significantly higher than in the control. While organic producers should include legume green manure crops in their rotation to provide N fertility, the pelletized poultry manure can supplement fertility by adding phosphorus and other nutrients, supplementing N to increase protein content, and yield improvement.

Crop yield potential is largely determined by moisture and fertility conditions prior to the onset of stem extension. The number of possible tillers is determined by the 3-leaf stage of the crop. The number of tillers that will be stimulated to grow is determined around Zadoks growth stage 30 (the onset of stem extension). At this same time, the plant will set the number of possible kernels in each head. As such, high N fertility early in the season will stimulate high yield potential by encouraging more tillers and kernels per head. Environmental conditions during the middle of the season will determine how many of the activated tillers will survive, and how many kernels will fill. High kernel numbers and moisture content accompanied by limited N fertility later in the season results in low protein content in the grain. Hence timing of nutrient application and nitrogen release can have a significant impact on yield and protein content.

Speerville Mill targets 13.5% protein as a minimum for its wheat. Conventional wheat used for white flour in white bread typically only requires 11.5% to 12% protein, although higher protein is sought after to allow blending with cheap low protein grown. In organic milling, however, most flour is sold as whole grain (including the germ and bran). This dilutes the protein content in the flour, and hence a higher protein content in the grain is needed.

AC Barrie and AC Walton are the preferred cultivars of spring wheat being grown organically in the Maritimes (personal communication, Todd Grant, Speerville Mill). AC Barrie typically exceeds the 13.5% protein requirement but is lower yielding than Walton; while AC Walton typically has lower protein but is higher yielding. The balance between protein content and yield may be improved upon by supplementing with nitrogen. In this study we determined the net economic return resulting from pelletized poultry manure applications to organic wheat as influenced by yield, protein content and bread making quality.

Methods

Pelletized poultry manure (Nutriwave 4-1-2) was applied in small plots (1.25 m x 10 m) before planting, at growth stage 30 (GS30) or as a split application (in NB only). The experiment included all combinations of the following treatments:

i. Rate of Nutriwave: 0, 1000, 2,500, 5,000, 7,500 kg ha^{-1} (where we assumed that 2% available nitrogen)
ii. Timing: broadcast and incorporated prior to planting, topdress at growth stage 30
iii. Cultivar: AC Barrie, Walton

The experiment was conducted at three locations in 2007 (NB, PEI, NS). Nutriwave was applied using a drop spreader and preplant incorporation was performed with a light cultivator. Plots were finger weeded once at each site. The NB plots received the Nutriwave as a 50:50 split application at preplant and GS30. Grain was harvested at maturity using a plot combine, with grain then dried and weighed for yield (adjusted for moisture content).

Results

A trend of increasing yield with increasing Nutriwave application rate was observed in the New Brunswick plots, however, the response was not statistically significant (results are not shown). Fertility levels at this site were quite high, as indicated by the high yields even in the plots receiving no fertilizer. This high fertility also contributed to the subdued

yield response to supplemental fertility provided by the Nutriwave applications. In contrast, soil fertility was lower at the PEI site, resulting in a stronger response to the Nutriwave. The yield response was lower when Nutriwave was applied at GS30, than when applied preplant (Figure 1); however, the GS30 application produced a significant protein response when applied at a rate of 2.5 tonnes/ha (Figure 2). The protein content of Barrie was higher at GS30 than for Walton, but yield was also quite a bit lower (Figure 3).

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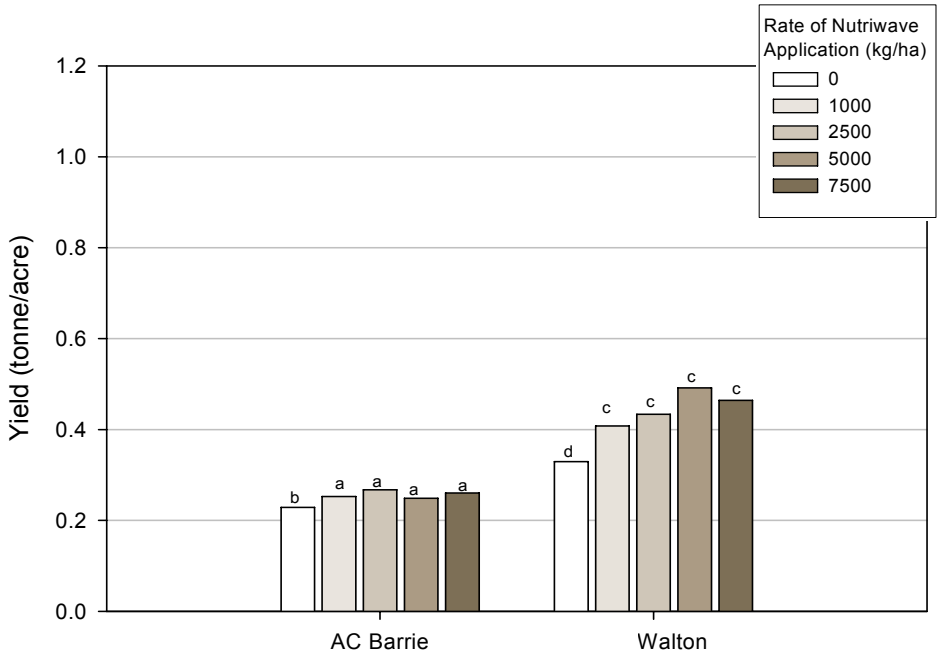
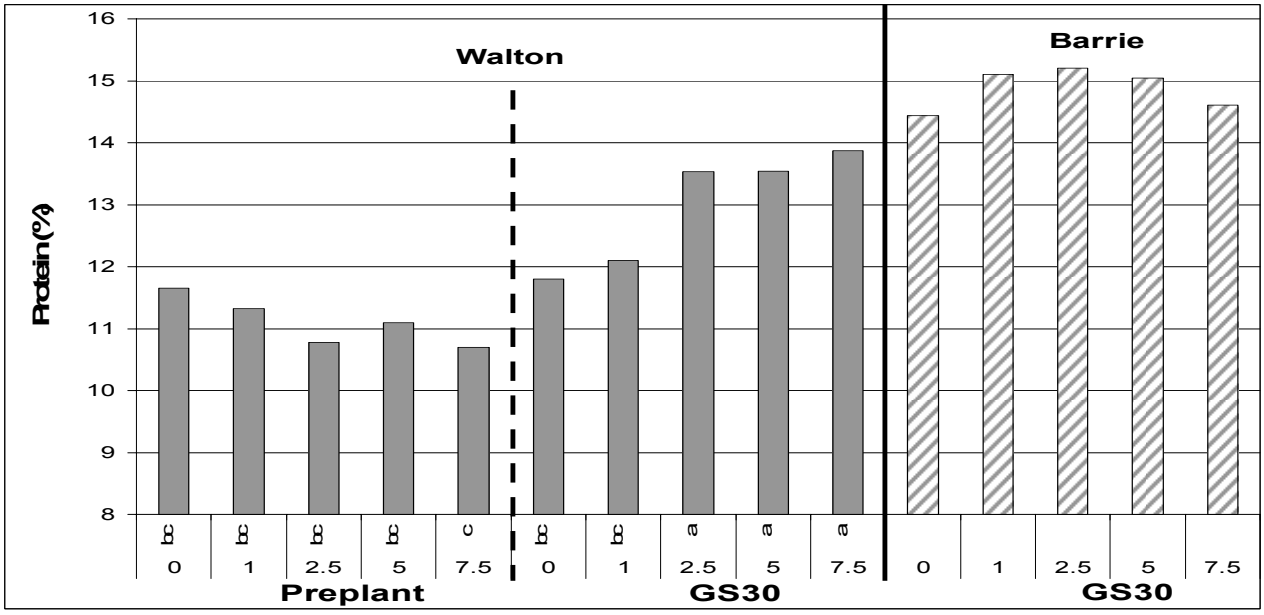


Figure 1 (top) – Yield response of Walton wheat Nutriwave applied at preplant or at GS30 b) Yield response of AC Barrie and Walton to Nutriwave applied at GS30. Columns with the same letter are not significantly different.

Figure 2 (below) – Protein responses to Nutriwave applied to Walton wheat preplant or at GS30 and to AC Barrie at GS30 in PEI. Columns with the same letter are not significantly different.



OACC Research: Protein Yield of Oats, Barley, Peas and Mixes

Background

Growing mixtures of peas and cereals has the potential to improve yield and protein content. Peas typically have a protein content in the range of 20-25%, while oats and barley have less than 15% protein. Most feed rations target protein contents in the range of 16-18%. Still, many farmers have a tendency to simplify their production by growing straight cereals.

Objectives

To further assess the potential benefits of including peas in mixes with cereals as a feed crop.

Methods

Baton hulless oats and CDC Sterling barley were grown either as monocrops or in mixtures with peas (CDC Mozart) at one site in each of NB, NS, and PEI. A randomized block design was used with 3 replicates of all treatments except peas and barley which had 6 replicates (2 reps in each block). The target stand density of oats and barley was 402 plants/m2 in monocrops, 300 plants/m2 in 2-way mixes with peas, and 150 plants/m2 in a 3-way mix. Peas were seeded at a rate targeting 69 plants/m2 when grown in the mixes (approximately 19% of the total seeded density). Individual plots were 1.25 m wide by either 8.5m or 10 m long depending on site. Harvested grain was weighed for yield determination (accounting for moisture), ground and tested for total N content by combustion using a Leco analyzer. Protein was calculated as %N x 6.25.

Results

Results are shown in the table below. Cool wet spring conditions reduced yield overall in NS, especially with the peas. In NB and PEI, including peas in the crop mix increased yields by approximately 75% over hulless oats or barley grown alone. The three-way mix of oats-peas-barley performed well, as did the oats-peas mix. Of the mixes the pea-barley mix was least productive except on the NS site under wet conditions. Hulless oats yielded higher than barley in PEI and NB but not in NS. The protein content of hulless oats was 2-3% higher than for barley across all sites. Overall, the protein yield was slightly higher for hulless oats than for barley, but it was still less than half of the average protein yield in the mixed crops.

Mixtures of hulless oats with peas (and possibly barley) can produce a good yield of feed grain with a protein content suitable for feeding.

By Dr. Andy Hammermeister

Crop	Total Yield (kg/ha @13.5% H_2O)	% Peas	Protein (%)	Protein yield (kg/ha)
Peas+Oats	2616	43.6	18.3	479
Peas+Barley	2608	39.9	16.9	442
Peas+Oats+Barley	2714	35.1	16.7	454
Oats	1537	0.0	13.8	213
Barley	1522	0.0	11.6	177

Cover Crop Workshops

In April, ACORN organized three workshops featuring Claude Berthélémé, New Brunswick Organic Production Specialist, in Fredericton, Charlottetown and Truro. Over sixty people attended the full-day program, which included an abundance of photos, detailed crop information for the Maritimes, and two films.

The handbook used for the workshop was *Under Cover: A Guide to Using Cover Crops for the Maritimes* by Janet Wallace and Jennifer Scott. First published in 1995 by NSOGA, the book has just been revised and re-issued by ACORN. All workshop participants were provided with copies of the book. A limited number of copies are available for $10.00. To order, please call ACORN at 1-866-322-2676.

This workshop was the second in the ACORN *Building the Soil* workshop series, funded by Agriculture and Agri-Food Canada and ACAAF. Notes from all the workshops are available at the ACORN website at www.acornorganic.org/workshopnotes.html. The final workshop in the series will be held in Fall 2008. Stay tuned for details!

NOTICE: Currently the Sussex and Studholm Mill is seeking certification with EcoCert Canada. We hope to be producing animal feed by mid-summer.

Coop Atlantic Brokerage is looking for various certified organic grains and looking for product for the fall. If you have some for sale please contact Shonda Babineau at 1 800 561 5556, 506 858 6178 or by email at Shonda.Babineau@coopatlantic.ca.

OACC Research: Testing Wheat Variety Yields and Protein Content

Background

Conventional wheat used for white flour in white bread typically only requires 11.5% to 12% protein. However, a premium is offered for grain over 13.5% protein because it can be used to blend with less expensive grain with lower protein. In organic milling in the Maritimes, however, most flour is sold as whole grain (including the germ and bran). This dilutes the protein content in the flour, and hence a higher protein content in the grain is needed. As a result Speerville Mill targets 13.5% protein for its wheat.

AC Barrie and AC Walton are the preferred cultivars of spring wheat being grown organically in the Maritimes (personal communication, Todd Grant, Speerville Mill). AC Barrie typically exceeds the 13.5% protein requirement but is lower yielding than Walton; while AC Walton typically has lower protein but is higher yielding. The yield and protein content of these and other varieties depends largely on site and supplemental fertility and environmental conditions. AC Helena is a modern milling wheat commonly grown in the Maritimes. Red fife is a heritage variety of wheat with typically lower protein than modern varieties, but having unique breadmaking and flavour qualities preferred by some bakers and consumers. Here we evaluated the yield and protein content of wheat varieties under sites with high and low fertility.

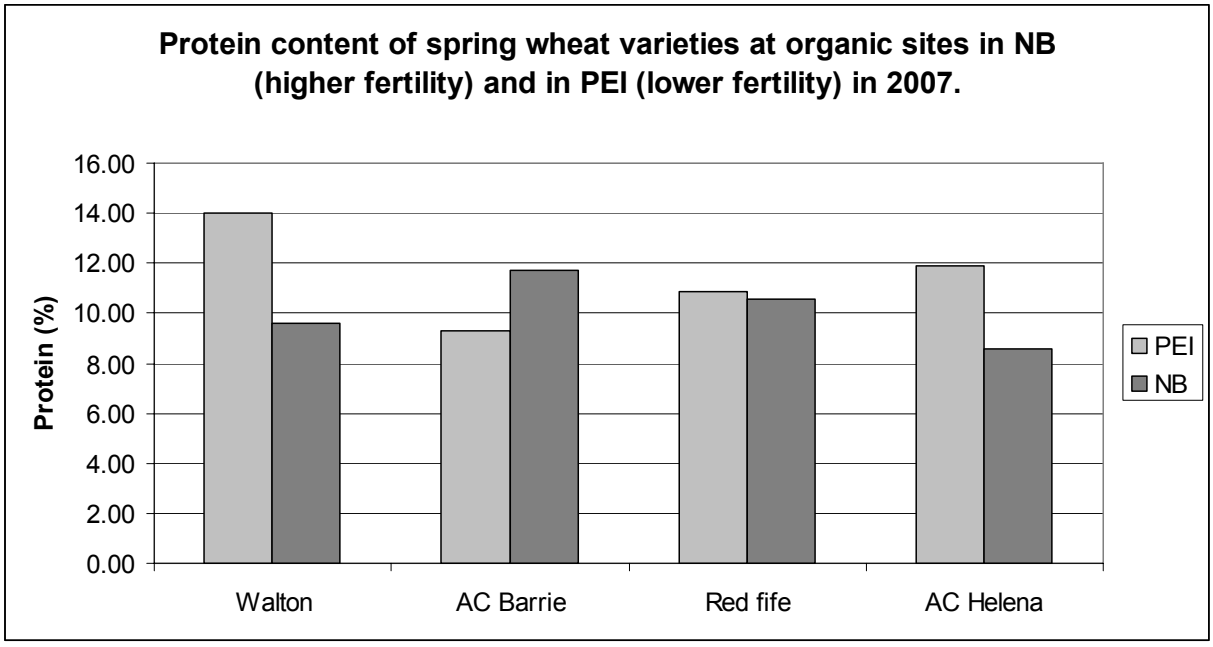
Methods

The experiment was conducted at 2 locations in 2007 (PEI and NB). The NB site was higher in fertility than that in PEI. Small plots were seeded with four wheat varieties, namely Walton, AC Barrie, Red Fife and AC Helena.

Results

Higher fertility typically results in lower protein content and higher yield, as the plant responds to available nitrogen by increasing the number of tillers and the number of kernels per head. Interestingly, in these trials red fife wheat was shown to maintain protein content across the two sites of this study, despite showing a higher yield at the high fertility New Brunswick site.

Protein content of Walton and AC Helena dropped considerably under the higher fertility condition of the NB site relative to PEI (see image below), as these cultivars responded to fertility with a significant increase in yield. AC Barrie increased in both yield and protein in response to higher fertility. There is a clear difference in the response of wheat cultivars to fertility status. Crop management and cultivar selection should be adjusted according to site conditions.



Cropping System Management Tips

By Andy Hammermeister, Organic Agriculture Centre of Canada

Note: the following is a list of tips and points to consider as you go through the planting period.

1. **Crop Selection**
    a. Select crops that best fit the timing in your rotation:
        i. Heavy vs. light feeder
        ii. Cash crop, feed crop, soil builder
        iii. Previous crop: avoid disease risk
    b. Weed issues
    c. Timing of planting
    d. Risk/reward analysis (cost of production, potential return, risk analysis)
    e. Suitability for underseeding if needed

2. **Cultivar Selection**
    a. Select cultivars that match your:
        i. Fertility level
        ii. Seeding date – late planting → shorter days to maturity
        iii. Crop heat units (CHU) available
            1. Varieties with higher CHU requirements generally yield higher, but may not mature properly, or will be late maturing (risk of damage)
            2. Grow varieties with CHU requirements slightly lower (100 CHUs) than available in the area to help ensure high vigour and good maturity
        iv. Quality requirements
    b. Resistant to:
        i. Insect
        ii. Diseases
        iii. Lodging
        iv. Winterkill
    c. Yield potential
    d. Suitable for underseeding if needed

3. **Seed Quality**
    a. Seed purity: damaged seed, weeds, other materials
    b. Viability, germination, vigour
    c. Thousand kernel weight or test weight
    d. Disease presence
    e. Age
    f. Seed treatments
    g. Chemical treatments can reduce risk of various disease or insect problems
    h. Can promote mycorrhizal colonization of the crop roots
    i. Can promote the soil biology in the rhizosphere
    j. Inoculate legumes with appropriate Rhizobium, can increase yield by 30%

4. **Seedbed preparation**
    a. Seedbed temperature
    b. Straw management
    c. Evenness
    d. Clumpiness
    e. Stones
    f. Moisture content
    g. Firmness
    h. On heavy soils, may need to do preliminary tillage of cover crops in fall

5. **Seeding Date**
    a. Wheat, oats, barley, peas all well-adapted to cool conditions: Early planting generally recommended (as soon as can get on field)
    b. Can lose 10% of yield for every week you delay after field can be worked
    c. Early planting allows better harvest conditions
    d. Late planting can be used to allow preplant field operations for weed control or incorporation of manures, cover crops etc.
    e. Soybean should be planted in warm soils (15^{o}C at midday)
    f. Slow establishment in cool soils will weaken the crop and make it more susceptible to pests and diseases, less tolerant of herbicides, and less competitive with weeds
    g. However, do not further delay plantings it will affect yields
    h. IMPORTANT: Delay planting at least 3 weeks after a ploughdown of sod or cover crops to allow decomposition of organic matter; else phytotoxins may inhibit growth

6. **Seeding rate**
    a. Adjust for thousand kernel weight (tkw)
    b. Increase if expecting high weed pressure
    c. Increase to promote uniform maturity and quality
    d. Increase if:
        i. Expecting establishment losses
        ii. Germination
        iii. Vigour
        iv. Poor seedbed or seeder
        v. Post-emergent mechanical weed control
    e. Target plant populations:
        i. Spring wheat 300 - 400 plants/m^2
        ii. Winter wheat 350 – 450 plants/m^2
        iii. Barley 250 – 350 plants/m^2
        iv. Oats 200-300 plants/m^2
    f. Crop establishment rates can be as low as 60% of viable seeding rate depending on conditions
    g. Crop establishment rate reduced by
        i. Planting too shallow or too deep
        ii. Cool wet soils
        iii. Decomposition of organic matter
        iv. Pests (e.g. wireworm) and diseases
    h. Reduce by 50% if planting as cover crop for forage establishment
    i. Reduce by 25% if underseeding forages as a cover crop
    j. Organic: Increase 25% to compete with weeds and compensate for tine weeding
    k. For hulless oats and barley, increase seeds/m^2 by 25-30% to account for lower establishment rate
    l. Seeding rate (kg/ha) = (g/1000 seeds x seeds/m^2) x 10

Seeds/m^2 = seed rate (kg/ha) / (g/1000 seeds x10)

Seeding Rate Calculation Example:
Desired seeding rate of wheat is 400 seeds/m^2. The 1000 kernel weight of the seed is 34 g/1000 kernels, and the germination rate is 80%. What is the proper seeding rate in kg/ha? How do you calibrate the seed drill?
Seed rate (kg/ha) = g/1000 seeds x seeds/m^2 **x** 10
= (34 g/1000 seeds x 400 seeds/$m^{2)}$ **x** 10
= 136 kg/ha
Now adjust for germination rate:
Adjusted seeding rate = seeding rate (kg/ha) ÷ germination rate (%) **x** 100
= 136 kg/ha / 80% **x** 100
= 170 kg/ha
Note: kg/ha ÷ 1.12 = lbs/ac

7. **Seeding Depth and Packing**
    a. Planting at 2.5 cm depth ideal, but cereals can tolerate up to 7.5 cm (if larger tkw)
    b. Small seeded crops must be planted shallow (1-1.5 cm)
    c. Deeper planting delays emergence and reduces vigour of seedlings resulting in:
        i. Increased susceptibility to diseases and pests
        ii. Reduced competitiveness with weeds
        iii. Uneven emergence (herbicide application issues) and maturity
        iv. Deep planting bigger problem on cold/wet soils
    d. Good seed soil contact essential for rapid and even establishment
    e. Plant into a firm seedbed and/or pack behind the seeder
    f. Organic: Deeper planting when soil is warm can allow preemergent weed control
    g. If shallow soil is dry, must plant seed deeper into moist soil (unless you know rain is coming)
    h. Do not plant soybean just before a cold rain!
    i. Plant shallow if soil is wet to reduce disturbance and making a mess
    j. Level fields and reduce planting speeds to ensure uniform depth
    k. Cereals seeded too deep will have delayed emergence and suffer yield penalty like when seeded a week later
    l. Winter cereal survival improved if planted at right depth.
    m. Packing before planting:
        i. Stimulates a flush of weeds
        ii. Creates a firm seedbed
        iii. Creates uniform and firm soil for fingerweeding
    n. Packing after planting:
        i. Improves seed-soil contact
        ii. Can stimulate competitive weed growth (use a seeder that packs only in row)

8. Fertility

a. Build soil with a good rotation plan
b. Include legumes in your rotation
c. Follow green manure or forage legumes with heavy feeder
d. Follow grain legumes with medium feeder
e. Follow heavy and medium feeders with light feeder or legume
f. Soil test in spring (or late fall) to assist with fertilizer recommendations
g. Maintain P & K to promote establishment in cold soils
h. N application recommended before planting or as split application
i. Minimize N application at planting for winter crops to avoid losses
j. Do not place excess N (e.g. poultry manure) with the seed, will burn the seed
k. High spring N stimulates high yield potential through more tillers and kernels/head but mid-season N stimulates high protein (in wheat)
l. Heavy straw cover will cause N immobilization (temporarily reduce N availability)
m. Chop straw and spread it evenly if not baling
n. Monitor fertility status by crop scouting

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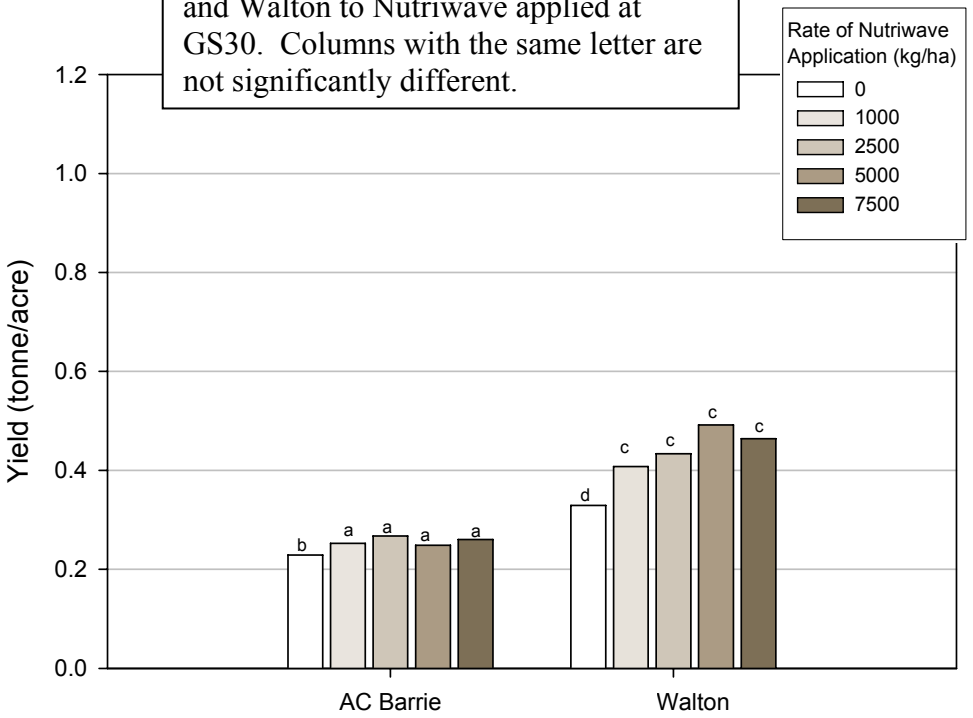

Figure 3 – Yield response of AC Barrie and Walton to Nutriwave applied at GS30. Columns with the same letter are not significantly different.

Pelletized poultry manure can contribute to yield on less fertile sites, but cost-effectiveness will depend on wheat prices and premiums that may be available for high protein grain. The application of Nutriwave before planting serves to stimulate plant growth and increase tiller number, thereby increasing yield. A shortage of nitrogen during the early growth stages tends to limit the allocation of resources to tiller formation, resulting in fewer tillers and lower yields. When Nutriwave was applied after tiller determination (GS30), the result was increased allocation to the seed production in few tillers, resulting in grains with a higher protein content.

The price of Nutriwave is approximately $95 per tonne + shipping. Bulk shipments may be less expensive. Applications rates at 2.5 t/ha would cost approximately $250 + application costs. The yield increase measured under the lower fertility site in PEI was approximately 250 kg/ha which, at $500/tonne for wheat, results in only $125/ha return. While a protein benefit was also observed, not all local organic markets are willing to pay a premium for higher protein content. Based on these preliminary results, the application of Nutriwave, while providing a yield and protein content benefit, is not economical for milling wheat production. This research will be repeated again in 2008 to verify these results.

By Dr. Andy Hammermeister

Touring Homestead Organics and Derks Elevator

By Mark Bernard, Coordinator of the Maritime Organic Grains Network

In April, I arranged to travel to Ontario to visit Homestead Organics and Derks Elevator Inc. The purpose of the trip was for me to see other areas of the country that have been producing organic grain and the technology that is used to process grain for feed or food.

Since the start of Homestead Organics in 1997, the facility has continued to diversify its products and services, increasing in size and yearly production.

It is located in Berwick, between Ottawa and Cornwall, and is much the same as many small towns and villages, with most business slowly closing down as more people travel a little further for everything they need. The exception to this is Homestead Organics, which acts as the regional organic farm supply center.

The actual mill dates from the late 1940's with 17 wooden bins inside the mill that now hold organic food & feed ingredients. Outside the mill steel grain tanks have been added over the years for additional storage. The mill uses one main elevator leg to bring product from transport trailers into a 40 tonne tank which then gravity feeds into the rotary cleaner and goes back through the elevator leg to long term storage. When product is needed inside the mill it is augured into the leg and into one of the 17 wooden bins.

Inside the mill I was impressed by both how clean the entire mill was and how obviously complex of a system that had been set up, but how simple it looked and worked. The mill utilized gravity as much as possible. Feed ingredients from the 17 overhead bins are taken by means of a scaled feed cart dumped into a leg, which can put it through either a hammer mill or double roller mill, then into the mix mill that was part of the original equipment of the mill. Batches are mixed and then elevated either to a bagger or to outside overhead shipping tanks above a 75 foot scale.

There are seven very busy employees at the mill. Three are always on the floor cleaning, mixing and bagging grain, one is responsible for the retail and bookstore, one for operations, and the livestock nutritionist is usually on the road visiting farms. Tom can be found in the office or working on the production floor. Homestead has expanded over the years, offering organic seed, organic soil inputs, organic pest controls, organic livestock supplements, food grade soybeans, and buckwheat. It will soon to become a certified seed conditioner.

The second place I visited was Derks Elevator–the place where Homestead Organics has their organic feed soybeans roasted. When I had arrived Gary Derks had the roaster operating and you could smell the sweet roasted beans in the air.

The Derks Elevator roasts both conventional and organic soybeans. The beans are also steeped, a process in which the beans are held at a constant temperature for a period of time to ensure that the urease and trypsin have been deactivated enough to be digestible for either mono gastric or ruminant animals. After steeping, the beans are put through a flaker that produces an end product that is easier to feed directly to the cattle.

Gary had said that many of his conventional dairy farmers mix flaked beans into the TMR mixer. Most of the equipment that Gary operates was fabricated right on the farm. In particular, the steeper was built and modified many times and there are still other things that he would like to have done to it.

Tom Manley, Homestead Organics, presents at the Organic Grain and Oilseed Forum, March 6th, 2008.

Organic Agriculture Center of Canada 2008 Organic Research

Green Manure Trial –From this trial we will be able to understand the value of a clover plough-down for different types of cereals. The type of cereals in the trial are: Barley – 8 varieties (4 varieties of 6 row, 2 varieties of 2 row, 2 varieties of hulless barley); Oats - 2 varieties (1 hulless oat, 1 covered oat); Corn – 2 varieties (2400 CHU, 2475 CHU).

Wheat Variety Trial – 5 different varieties of milling wheat will be grown.

Wheat Fertility Trial – This is the second year for this trial where two varieties of wheat are grown with multiple combinations of pre and post fertility to achieve high yield and good milling protein.

Hulless Oat Seeding Rate Trial – To determine a recommended seeding rate for farmers.

Corn Weed Control Trial – Four treatments will be planted in row (clover, soybean, lupins and tillage).

Oil Seed Pumpkin – Variety, fertility and planting date trials.

Under seeding Cereal Trial – Monitoring two farms using fingerweeding that will be under seeding clover to cereals to determine whether the placement of the clover (before, mid or after fingerweeding) effects the establishment.

Management Trial - cereal and oat pea mixed crop responses to timing of ploughing of an old forage stand, and cover cropping.

What's Next for the Maritime Organic Grains Network?

There's quite a bit of activity over the next several months planned.

The field trials are in full-swing, and to help everyone see first hand the results we are experiencing, there will be at least one field day in each Maritime Province.

MOGN is planning a workshop on post harvest grain handling, before harvest. The date will be announced in the next newsletter (late July).

In the fall, MOGN will complete another Maritime grain production survey.

MOGN is also planning to launch a seed database for mid winter.

As you can tell it is shaping up to be yet another busy year!

We appreciate input for ideas, locations of field days and any information that you may want to tell the rest of the network.

Please don't hesitate to call Mark Bernard ((902) 439-1182 or (902) 887-3188 or email mbernard@nsac.ca), Andy Hammermeister, OACC (902-893-8037), or Beth McMahon, ACORN (toll-free at 1-866-322-2676).

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