Maritime Organic Grains Network Newsletter

Issue Five, Winter 2009

Challenges from the European Wireworm

By Joanna MacKenzie

Walking through a recently planted grain field, your eyes fall upon a stretch of yellowed seedlings. Bending over to look more closely, you tug at a plant only to pull it out of the ground, its roots severed. Looking closer still, you see it: It lurks just beneath the surface of the soil, a seemingly innocent although ubiquitous, worm-like creature with a hardened yellow surface. Plucking it out of the soil, the creature lays quietly in your hand, seeming to pose no threat. Yet, in your hand you now hold the insect responsible for countless crop losses across Canada: the wireworm. The two eyespots on its hind end betray its true identity…it is a European wireworm, the most ravenous of the species. They were introduced to Canada in the soil ballast once used to steady empty ships as they returned from the Old to the New World to load up on lumber. Unfortunately, these small creatures have had a profound effect on agricultural systems.

After many destructive years in the soil, the wireworm pupates, emerging the following spring as a click beetle. In contrast to the larval stage, the adult click beetle is short-lived, inconspicuous and docile. Named for their ability to right themselves by flipping into the air with an audible snap, click beetles survive only long enough to mate and lay their eggs that hatch to release wireworms.

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The 2009 ACORN Conference & Trade Show "Organics: Good for You, Good for the Planet" is here!

February 26th – 28th at the Holiday Inn in Truro, NS

Details and registration on ACORN's website:

http://www.acornorganic.org/conference.html

Don't miss out!

The ribbon was cut at the Sussex and Studholm Agricultural Society's feed mill Thursday, January 15, to recognize the Co-op's new organic feed production line. Sussex is the only feed mill in Atlantic Canada manufacturing and distributing locally grown grain.

Inside this Issue:

Cultivar Testing Yield Results from 2008 By Todd Reid

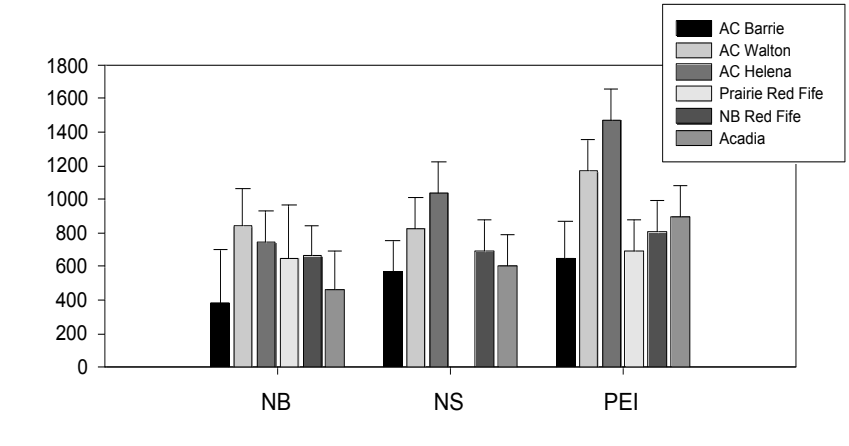
High yield and protein content are a challenge for both organic and conventional producers of spring wheat in the Maritimes. Wheat cultivars respond differently between different sites. A spring wheat cultivar specific to organic agriculture has not yet been developed in Canada and unfortunately, cultivar recommendations specific for organic agriculture do not yet exist in the Maritimes; selections are typically made according to processor preferences. In Canada, our wide geographic area, and many different climate zones, makes cultivar selection a regional decision with recommendations often made by provincial governments. This study was undertaken to investigate the production potential of different spring wheat cultivars in the Maritime Provinces. The results from the full study are still being analyzed; however the preliminary results from 2008, presented here, are interesting.

In 2008, the trial was conducted on three locations, one in each of the three Maritime Provinces. The trial included AC Barrie, and AC Walton (cultivars preferred by Speerville Mill), AC Helena (a common cultivar used in the Maritimes), Acadia (an old cultivar very limited seed availability, and may not be commercially produced) and two sources of Red Fife (one from a prairie source and the other from a New Brunswick source). Due to the variable and long history of Red Fife in Canada, the two seed batches were kept separate and treated as different cultivars. Thus "New Brunswick Red Fife" and "Prairie Red Fife" were grown along with the other cultivars listed. Unfortunately the seed for Prairie Red Fife was not available for planting at the Nova Scotia site.

Overall in 2008, yield on all the sites was relatively low, with the highest yield coming from the PEI site. Evidence of cultivar differences was observed, with AC Helena and AC Walton, yielding the highest in all three sites, and AC Barrie yielding the lowest. We also see that some cultivars are more responsive in yield when conditions are good. Similar results were observed in 2007 (see OACC Interim research report E2008-46). Some cultivars performed differently at each site, which is still being analyzed, however the two Red Fife seed lots did not yield differently. Grain protein is also being measured and will be reported in a future newsletter.

When it comes to cultivar selection, the choice is the farmer's. These results may assist with the decision making process, but should not be considered as specific cultivar recommendations. Our findings show that producing high quality milling wheat under organic agriculture is achievable in the Maritimes, even if the cultivar itself is bred for yield over protein. This study was limited to cultivars of special interest to local processors. Many other wheat cultivars are available and may be tested if growers and processors express a need.

Todd Reid *is a Research Associate at the OACC. Please send comments or questions by phone to 902-893-7256 or by email to oacc@nsac.ca.*



Grain yield for six spring wheat cultivars grown on three sites (New Brunswick: NB, Nova Scotia: NS, Prince Edward Island: PEI) in the Maritimes in 2008. Prairie red fife was not available for planting at the Nova Scotia site.

This research was conducted at the OACC by: Andy Hammermeister with the assistance of Don Kerr, Linda Poon, Mark Bernard and Lloyd Rector. Funding for this research was provided by: the Province of Nova Scotia, the Province of PEI, and the Canada/New Brunswick Embracing Innovation in Agriculture and Agri-Food Program. The on-site farmer cooperation of Tom Lask in NB and Barnyard Organics in PEI was greatly appreciated.

Challenges from the European Wireworm by Joanna MacKenzie

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Wireworms are notoriously indiscriminate in their food choices, being attracted to the carbon dioxide emitted by any growing vegetation in the soil. Combine this voracious appetite with a lengthy lifecycle, up to five years, spent dwelling in the soil and you have a very destructive creature. Countless crops are vulnerable to attack. Preferring the warm, damp soil conditions that prevail in the spring and autumn the wireworm migrates to the soil surface, only to retreat to the depths when the soil becomes too dry or cold. This movement renders crops such as grains susceptible to wireworm attack in the early stages of growth, and also puts late harvested root crops at risk in the fall feeding period. It has been suggested that up to a quarter of potato crop losses in North America can be attributed to wireworm feeding, riddling the surface and flesh of the tuber with holes and rendering the crop unmarketable.

Potent and environmentally persistent insecticides were once used to silence the wireworm, but the removal of many organophosphate-based pesticides from the Canadian market has left crops vulnerable to wireworm attack. Alternative strategies have been attempted with varying levels of success, such as altering the timing of planting or harvest in an attempt to avoid peak feeding periods, timing tillage operations to target the eggs and newly hatched larvae that constitute the most susceptible periods in the wireworm life history, instituting biological control measures, and the employment of trap crops.

Many farmers' crops, as well as the Organic Agriculture Centre of Canada (OACC) research plots, have been seriously challenged by wireworm feeding. Therefore, staff rallied to develop alternative cultural management strategies to tame the wireworm and mitigate damage, strategies that can be employed by organic and conventional producers alike.

OACC, in conjunction with Agriculture and Agri-Food Canada, is examining the potential for the incorporation of unattractive or damaging crops in a cash crop rotation to reduce wireworm levels in infested fields. Crops under evaluation include brown mustard that contains compounds harmful to the wireworm, flax that may be nutritionally inadequate to support larvae, alfalfa that may create an inhospitable soil environment with its water wicking root system, and buckwheat with a rapid growth rate that may be amenable to tillage at those times at which wireworms are most susceptible. Research is also targeted at the development of a strategy in which wireworms can be pulled away from a root cash crop through the use of an attractive bait crop, pushed away through the use of compounds that may invoke plant defenses against herbivory or otherwise limit wireworm feeding, or immobilize through the disruption of the wireworm lifecycle.

Contemplating the history and significance of the creature that you still hold in your hand, you decide to take action. With a satisfying squish, one less wireworm will damage your crop. Now to tackle the rest!

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A Study of Organic Seed Treatments By Donald Kerr

From the moment of being sown, seeds must survive and grow in the face of adversity – low temperatures, water-logged soil, biochemicals from nearby plants, hungry insects, and various disease-causing microorganisms can all pose problems. Good management practices and a bit of luck can help mitigate such threats, but fungal and insect pests persist as potential problems to crop survival and yields. To counter them, humans began treating seed in ways that either helped stimulate the seed directly, or helped reduce the likelihood of disease taking hold. There's no question they've had a huge impact on agriculture and the Green Revolution, but what is an organic farmer to do?

Seed treatment is a chemical, biological or physical process designed to influence microorganisms on, in or around the seed, or to stimulate germination and vigour of the resulting seedling. The desired result is to benefit the crop plant by offering it developmental advantages that lead to good establishment, enhanced yield and improved quality. This is accomplished by elimination or reduction of disease-causing organisms, or by promotion of growth-supporting factors such as beneficial microbes. Chemical pesticides are prohibited in organic agriculture, but it turns out there are other options. A growing variety of organic-approved seed treatments is commercially available or otherwise acceptable, and may have merit in facilitating crop growth and establishment. As part of my M.Sc. research at the Nova Scotia Agricultural College, in association with the Organic Agriculture Centre of Canada, I tested some organic-approved seed treatments on two-row common barley.

Seven OMRI-approved, commercial seed treatment products were selected, based on their suitability to climate and crop, and their varying ingredients or modes of action (implied or inferred). The following seed treatments were chosen: ASL™ TP (seaplant extract), Biodynamic Preparation 504 (composted stinging nettle), CB-QGG™ (liquid containing nutrients, stimulants, enzymes, and vitamins), HeadsUp® (powdered plant extract), MycoApply® (powdered seed inoculant containing beneficial bacteria), NanoGro™ (pellets containing trace nutrients), and SuperBio® SoilBuilder (liquid product containing select beneficial microbes). All samples of treated barley seed were compared with untreated seed to evaluate their performance using various indicators.

Preliminary studies involved lab trials, whereby organically-treated seed was subjected to germination and seed vigour tests. "Vigour" differs from germination as it describes the potential level of activity or *performance* a seed possesses, and dictates how effectively a seed is able to germinate and develop into a seedling. Vigour is often considered a more accurate measure of field performance than germination alone, since the optimal conditions of a germination test are seldom experienced in the field. Results were rather inconsistent between experiments, and in the end no seed treatment could be declared as offering a clear advantage over untreated seed.

The same seven treatments were put to the test in field plot trials in 2007, at three different locations (two located in Truro, NS, and one at Barnyard Organics Ltd. farm in Freetown, PEI). At each site, we planted replicates of treated seed in 10 m^2 plots along with untreated seed for comparison. Various performance indicators were measured in each plot (and at each site) over the course of the season including crop establishment, seedling height, seedling mass, harvested yield, thousand kernel weight, and test weight. While sites differed from one another to some extent (as sites often will), crop establishment was the only parameter affected by one of the seed treatments – whereby the MycoApply treatment actually reduced crop establishment relative to the untreated control barley seed. This event did not recur I admit, it was a bit surprising that there was otherwise no difference between

any of the treated seed and the untreated control.

Seed treatment introduces an extra step in the processes leading up to planting, and there's usually a cost in terms of both the application time and the money spent on the treatment itself. Most seed treatments are relatively easy to apply in bulk, often mixed in while seed is passing through an auger from one place to another. Either way, though, there needs to be sufficient payoff in terms of increased yield, harvest quality, soil health, or disease control for seed treatments to be worth it. Treatments that inoculate seed with beneficial microbes have proven valuable among legumes in particular, but such treatments are only effective if the "correct" (crop-specific) microbes are added. Proper storage and handling of biological seed treatments and treated seed is also important, since we must recall that the microbes in that powder or liquid are indeed alive and need to be kept that way if they are to do their job once the seed has been planted.

The performance of a seed treatment that is approved for a particular crop may vary from year to year depending on planting time, seedbed conditions, the presence or absence of insects or disease-causing microorganisms in the soil, even the genetics of the cultivar selected. While no significant treatment effects were observed in the barley experiments described here, there is evidence seed treatments have worked on certain crops grown under certain conditions. Further research is warranted to establish the scope and value of organic seed treatments. Agricultural researchers are only beginning to learn the details and complexities of what many organic farmers intuitively know already: that the biology of the soil is extremely important. A wide variety of beneficial and harmful microorganisms co-exist in the soil, and restoring balance to their populations – through crop rotations, tillage or harvesting practices, and perhaps even organic seed treatments – could build more resilience into our cropping systems.

Don Kerr *is a Research Associate at the Organic Agriculture Centre of Canada. Please send comments or questions by phone to 902-893-7256 or by email to oacc@nsac.ca.*

Gary Zimmer Rescheduled for March 10 & 11

Due to winter weather, well known organic farmer and soil activist Gary Zimmer was forced to reschedule his December PEI workshop until March.

Zimmer, of MidWestern Bio-ag, works with more than 3,500 farms and 75 trained consultants in Blue Mounds, Wisconsin, with satellite facilities in Iowa, Minnesota, and Michigan. His company also operates a research farm and learning center in Wisconsin (www.midwesternbioag.com).

Zimmer will present a workshop to the Island Organic Dairy Club on March 10th in Prince County. Gary Zimmer's main workshop will take place at the Farm Centre on March 11th. Please register at the door. Cost is $20 for COPC and ACORN members, and $30 for non-members. Please bring your own lunch, but refreshments will be provided. For more information, contact 902-893-9999.

Canadian Organic Standard Up-dated

The new Canadian organic standards are now available on the CGSB website. This comes after more than a year of industry review and voting on the changes.

Unfortunately, copies of the standards are not free and must be purchased. The standard (32.310) is $93.50 + GST and the Permitted Substance List (32.311) is $81.00 + GST. www.tpsgc-pwgsc.gc.ca/cgsb/on_the_net/organic/index- e.html

COG is holding workshops for producers on the new standard in Truro (Feb. 1), Charlottetown (March 12), St. John's (March 14), and Fredericton (March 24). Details and registration at www.cog.ca

Classifieds

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We are still buying 2008 crop soybeans for food, soybeans for feed, barley, oats, and peas. We are looking for deliveries in the spring and summer 2009. By February, we will start offering contracts for the 2009 crop. Thank you.

For Sale 12-15 tons of certified organic Barley AC Sterling 2 row variety tested low for toxins could be sold for seed call Ernest Culberson Five Tier Farms Woodstock NB. 506 328 3815 or 506 328 7534 or email ernestc@nb.sympatico.ca

Wanted: Feed grade soybeans. Contact Mark Bernard at Barnyard Organics Ltd.
Email: info@barnyardorganics.ca Phone: 902 887 3188

Wanted: Red Fife wheat seed suppliers. Contact Stacy at Hidden Meadow Farm. Email: stacycory@hotmail.com

Co-op Atlantic: Looking to purchase feed grade oats, wheat, barley and corn. Also now available at your local Co-op Country Store are a variety of organic feeds produced locally. Coming soon organic cereal seeds and a selection of grass and cover crop organic seeds. Not sure what to grow this coming season? Ask us what our needs are. Please contact qualityorganics@co-opsonline.com or 506 858 6178.

To up-date your contact information or be removed from the mailing list, please contact ACORN at 1-866-322-2676 or email admin@acornorganic.org.

Place a free classified by sending it to admin@acornorganic.org

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 in PDF at www.acornorganic.org/grainsnetwork.html

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Prince Edward Island AD APT Council

Agri-Futures

Nova Scotia's ACAAF Council
Advancing Canadian Agriculture and Agri-Food

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Le réseau du savoir biologique
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Linking Organic Knowledge
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