GROWING ORGANIC

Manitoba Organic Alliance

prairie organic grain initiative

MOA NEWSLETTER No. 5– OCTOBER 2018

In This Issue…

After some poor harvest weather across most of the province, hopefully most of you have grain in the bin, and are continuing with other fall field work before the ground freezes. As the growing season wraps up, conference and workshop season is just getting started! There are a lot of educational events planned over the next few months and hopefully you get to attend a few. These events are a great opportunity to learn from producers and researchers, and plan for the next growing season. In the next few issues of Growing Organic we will highlight some research results, producer stories and other agronomic considerations.

Phosphorus in Your Cropping System

Managing soil phosphorus (P) is essential to ensure good soil fertility, successful nitrogen fixation in legume crops, good quality and high yielding crops and, ultimately a profitable cropping system. The amount of P required to sustain your cropping system is dependent on initial soil levels, nutrient cycling processes, and nutrient removal at crop harvest. Phosphorus can be abundant in some soil types, this is not always in plant available form. While it can be released slowly, crop removal is typically higher than the amount released in a given season.

Where can I find the nutrient removal values for my crop?

Chapter 4 of the Organic Field Crop Handbook lists the nutrient removal values of cereal, pulse, oilseed and forage crops

(Organic Field Crop Handbook). Considering the amount of nutrient removal from your crop, is important to know when nutrients need to be replaced in your crop rotation.

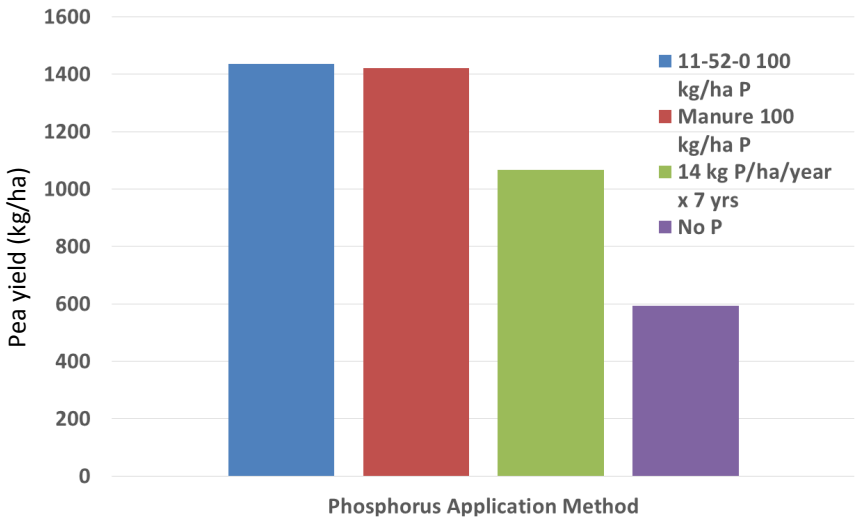
In the previous edition of Growing Organic, John

Heard (MB Ag), shared tips on soil sampling on organic farms. Soil sampling provides a good indication of soil P. Another tool, developed by Joanne Thiessen-Martens involves doing a bioassay of your green manure. Conducting a nutrient analysis on the green manure biomass will indicate nutrient concentrations within that plant material. Lower than normal nutrient concentrations in the plant, are an indicator of low nutrient concentrations in the soil.

Using these tools will help you make informed decisions when using inputs or planning crop rotations.

>0.3%	Available P levels are very high. Do not add additional manure to this field for some time.
0.25-0.3%	No P deficiency in current crop
0.2-0.25%	Adequate P in current crop, but soil P reserves may be getting low (check soil test results). Mycorrhizal crops such as flax, oats, pulses and corn may do better for the next few years. Begin looking for a manure source or other supply of P.
0.15-0.2%	Moderately deficient. Mycorrhizal crops may still grow well. Apply manure, compost or other amendment within the next year or two.
0.1-0.15%	Deficient. Even mycorrhizal crops may not grow well. Apply manure, compost or other amendment as soon as possible.
<0.1%	Extremely deficient. Even mycorrhizal crops will not likely grow well. Apply manure, compost or other amendment as soon as possible.

Table: Critical values for green manure plant tissue nutrient concentration recommendations for soil and crop management (Modified from Joanne Thiessen Martens original table.)



A study conducted by the Natural Systems Agriculture lab at the University of Manitoba demonstrated the important role of P in the yield of a field pea crop. The graph shows pea yield as a result of various phosphorus applications after alfalfa breaking. The pea yield from synthetic P fertilizer and manure were comparable. However there was a reduction in pea yield with lower manure applications and substantial yield reduction with no P added. Phosphorus is important to support nodulation and nitrogen fixation in legumes. Additions of manure in organic systems are an excellent way to maintain and increase soil phosphorus levels.

Composted or Raw Manure?

Livestock manure is composed of a number of nutrients, and organic matter which are essential to building soil organic matter and improving soil fertility. But, often it is asked, when applying manure should it be applied in the raw form or composted? In organic systems, incorporating any form of manure to provide phosphorus is important, but there are a number of critical benefits to composting manure before application.

Benefits of composted manure include; the creation of a stable nutrient source. This means that the valuable nutrients inside that manure are less likely to be lost through processes such as leaching or volatilization. The composting process also requires high temperatures, killing potentially harmful pathogens and weed seeds! This is very critical to reduce the likelihood of importing weeds into a high nutrient environment. Additionally, composting manure makes application easier and more cost effective as it reduces the mass and volume of raw material.

Important note! The amount of nutrients in manure can be variable and depend on the source (livestock feed, type, and bedding). It is important to test your manure, and know the amount of nutrients you are applying. This can help with management decisions around application rates and crop rotation!

Resources: *Organic Field Crop Handbook, Third Edition. 2017*

Intercropping for Diversity and Resiliency

James Frey, P.Ag.

Diversification Specilialist, Manitoba Agriculture

The **Parkland Crop Diversification Foundation (PCDF)**, in partnership with Manitoba Agriculture, is one of four Diversification Centres in the Province that conducts regionally focused, small-plot agricultural research. Located in Roblin, PCDF has a mandate to explore new crops, varieties and methods of agricultural production, and to increase the resiliency of the agricultural system in the Parkland region.

In line with this mandate, PCDF conducted trials in 2018 to explore the possibilities of intercropping. This broad approach to agricultural production involves **growing two (or more) complimentary crops in the same field**. The crops can be grown in the same immediate space (i.e., in the same planting row, or broadcast into an established crop), in alternating rows, or in alternating strips (i.e., different planting passes). Although not all crops are a good fit for intercropping, some can provide positive results.

PCDF conducted the following intercropping trials in 2018:

- Oat-hairy vetch
- Oat-cover crops (including alfalfa, alsike clover, Persian clover, subterranean clover, red clover, white clover, yellow sweetclover, cicer milkvetch, fall rye and Italian ryegrass)
- Quinoa-cover crops (same cover crops as above)
- Quinoa-pea
- Corn-soybean

The oat intercropping trials were successful, but insect pressure in the quinoa intercropping trials virtually wiped out the quinoa (more on this below). Due to seeder error and poor establishment, we abandoned the corn-soybean intercropping trial early in the season.

Oat intercropping trials

We planted the oat intercropping trials on June 12, following tillage. The oats were planted at 45 lbs/ac, and the accompanying crop was planted at the normal, full rate. With only one season of data and experience, oat-hairy vetch appears to be a great intercropping option. Early in the season, the oats grew quickly. The slower-growing vetch competed well against weeds, completely filling in the spaces of the oat canopy.

The oats were straight combined at maturity, when the vetch was still green (see Photo 1). Although the vetch had flowered, it had not produced seed. The green material passed through the combine easily and with some adjustments to reel and driving speed, did not result in wrapping or plugging. Oat yield was on par with non-intercropped oats, suggesting that the vetch neither reduced nor increased oat yield. Additionally, the straw was full of vetch (Photo 2), which may result in positive feed values for livestock. (PCDF will have the straw analysed for feed value.)

The vetch is well established, and in year two, we expect that it will produce a thick stand. Our options for management include disking the crop as a green manure, providing a large amount of nitrogen, or harvesting it for seed at maturity.

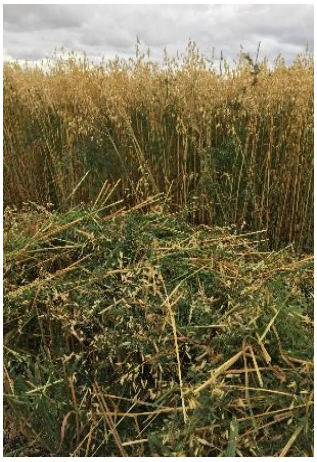


Photo 1: Oat-hairy vetch

Photo 2: Oat-hairy vetch stubble

Among the other oat intercrop treatments examined, the yellow sweet clover established well and did not significantly impact the oat yield. Other clovers did not establish as well, but it is unclear whether this was due to intercropping competition or to very dry conditions at seeding. We will observe overwinter survival for all cover crops, and have plans to repeat this trial in 2019.

Continued on next page...

Research updated continued...

Not surprisingly, fall rye and Italian ryegrass, known for their allelopathic traits, appeared to be poor intercrops with oats. The oat stand was much thinner (see Photos 3 and 4) and yield was reduced by up to 60%, compared to non-intercropped oats. Nevertheless, stands for both fall rye and Italian ryegrass were both excellent, and we expect to see good overwinter survival for those crops.

Photo 3: Oat-fall rye stubble

Photo 4: Oat-Italian ryegrass stubble

Quinoa intercropping trials

Despite the virtual failure of the quinoa crop, the accompanying pea and cover crops performed well. We seeded the pea crop at varying rates, and yields varied accordingly. The cover crops established well, and we will examine them in the spring to determine overwinter survival. Although we did not see the results we hoped for (that is, a quinoa harvest, plus intercrops), the quinoa crop failure demonstrates how intercropping can increase resiliency of the farming system. If we had planted only quinoa, we would have harvested nothing, but with an intercrop, we had a pea harvest (for one trial) and a good cover crop established (for the other trial).

Corn-soybean intercropping trial

We planted the corn and soybeans in alternating passes, resulting in 4 rows of corn (on 30-inch spacing) and 10 rows of soybeans (on 9.5-inch spacing). The purpose of this strip intercropping is to increase edge effect for the corn. Farmer-led experimentation in the United States[1] shows that increasing edge effect for corn can result in higher yields (due to more sunlight captured by plants), and does not reduce soybean yields.

Unfortunately, we had to abandon the trial after poor establishment due to very dry conditions at seeding, as well as seeding error. We plan to conduct this trial again in 2019 to explore the potential of this approach in our region.

[1]https://www.cornandsoybeandigest.com/precision-ag/farming-edge-strip-intercropping-edges-capture-more-light-reward-higher-yields

For more information on our work, feel free to contact me at james.frey@gov.mb.ca. You can also follow PCDF on Twitter @pcdf_roblin. Better yet, make a visit, and plan to join us at our annual Field Day or workshops held throughout the summer.

Equipment Review—The Camera Guided Inter-row Cultivator

In the September edition of Growing Organic we had producer reviews of The CombCut.

This month features two producer reviews of camera-guided inter-row cultivation equipment. There are a number of companies in Manitoba selling different brands of this weeding tool, so more choices out there for growers!

Image: Garford camera-guided inter-row cultivation in 6”dry beans

Christoph Gschossmann, Inglis, MB

- Has a Hatzenbichler camera-guided inter-row cultivator

This was the first year with the camera-guided inter-row cultivation equipment. I used the inter-row cultivator only in Red Spring Wheat this year.

The wheat was in the 3-4 leaf stage, and I was able to cultivate at a speed of 4-5 miles. This year I was only able to do one pass, but should have gone one more time. The wheat turned out really good, but harvest was in the field late.

There were no specific challenges with the equipment, it's plug in and play. The only thing that I had to change was the plug for the power, because the European plug didn't work on my tractor. The rest was just to hook it up and work.

Jason Peters, Poplar Grove Organics, Winkler, MB

Overview

Our Einbock unit is 43' wide on 10" spacing. It's set up to match our John Deere 1895 air seeder. It is used in all solid seeded (10" row spacing) crops, mostly hemp and wheat. Typically all fields are cultivated twice, the first time is when the wehat is at the 3 leaf stage, and the last is about 75% row closure. Hemp is similar, the plants have 2-4 true leaves for the first stage and rows are 50% closed for last pass.

Pros

- Crop can be at multiple stages and still be used, compared to a tine harrow which as a small window of opportunity to be effective.
- Camera and software are easy to set up and use.

Cons

- Camera guidance cannot track properly if rows are too thin
- Can plug in higher trash situations. Trash free fields are most ef-

Tips

-The smaller the crop, the slower you'll go. Running the unit in the early growth stages is possible, it just means slower operation to avoid burying. Waiting for larger crop size will allow you to run faster and do less damage to the crop.

- Operating speed is everything. The correct speed will allow you to move dirt and cover weeds but not burying the crop.

Thoughts

- This is the most effective weed control tool we have on our farm. Although it doesn't remove weeds in the row, used in combination with other tools it can be very effective.

If I had to invest in one piece of organic weeding equipment, this would be the one.

What you missed in the Coffee Shop!

Dr. Carolyn Marshall from Dalhousie University in Nova Scotia, joined the call in October presenting on "No-till Green Manures and Soil Health."

Highlights:

- No-till green manures are planting in the spring, grown for the season and then rolled down with a "roller-crimper" which then creates a mulch layer to be planted into the following spring.

- Having biomass of 6 tonnes/ha is important for the mulch to be weed competitive. Hairy/vetch barley seems to be able to provide this more consistently than other crops.

- No till termination can reduce tillage, reducing costs and providing soil benefits.

- There was no difference in Total Organic Carbon between fall tillage, spring tillage and no-till systems. However, there was more particulate organic carbon (quicker to respond to management) in the 0-5cm zone for the no-till system.

- Earthworms were measured over the 3 years. There were more earthworms in the first 2 years in the no-till plots. But by the third year there was a full recovery for earthworms.

- Systems with regular green manures create a "well-fed soil" which can buffer soils against negative effects of tillage.

Coffee shop talks are monthly conference call presentations. Previous talks are available on the natural systems agriculture youtube page. To learn more call or email Katherine Stanley (see below)

Upcoming Events:

- November 1-3: Organic Connections, Saskatoon, Saskatchewan.
- November 7-8: Soil Health Summit. Bismark State College, ND. Contact: lucinda.makedonski@nd.nacdnet.net
- November 14: Getting the most out of every acre: the science and practice of intercropping. Brandon, MB. Email Katherine.stanley@umantioba.ca for more information and to register. **See agenda on next page!**
- November 20-22: Canadian Hemp Trade Association, National Convention. Winnipeg, MB
- November 26-29th: 4-day Nutrition Farming Seminar. Contact Alex Boersch: info@regenagsolutions.ca
- November 27-28: Regenerative Agriculture Workshop https://mfga.net/conference.

Ideas for newsletter topics? More questions? Contact Katherine Stanley :

Katherine.stanley@umanitoba.ca; 204-474-6236

GETTING THE MOST OUT OF EVERY ACRE

the science and practice of intercropping

Keystone Centre, MNP Hall, Brandon, MB – November 14th, 2018

Coffee and Registration	8:00 am
Introductions	8:15 am
Dr. Martin Entz – University of Manitoba	8:30 am
Brooks and Jen White – 2018 Outstanding Young Farmers Manitoba	9:30 am
Coffee Break	10:00 am
Agronomy and Intercropping (Producer Panel) Facilitator: Scott Chalmers (WADO)	10:15 am
Producers: Nick Cowan (MB), Andrew and Patty Harris (MB), Joe Wecker (SK)	
Lunch	
Risks and Economics of Intercropping: Lana Shaw (SERF)	1:00 pm
Coffee Break	2:15 pm
Feasibility of Intercropping for Conventional Agriculture: Charley Sprenger (PAMI)	2:30 pm
Equipment and Marketing (Producer Panel) Facilitator: Charley Sprenger (PAMI)	3:00 pm
Update on intercropping opportunity within Ag Action MB: Matthew Wiens (MB Ag)	3:45 pm
Closing Remarks, Tony Szumigalski (MB Ag)	4:00 pm

$30/person $50/two people from the same farm

CCA Credits Pending

For registration contact Katherine Stanley at: 204-898-4122 or Katherine.stanley@umanitoba.ca

prairie organic grain initiative

MANITOBA Pulse Soybean GROWERS

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