NEWSLETTER

SPRING 2023

Welcome to the Atlantic Grains Council's 2023 Newsletter. My thanks to all who took time to develop the content. This Newsletter is only one way that the AGC delivers information of interest to cereal and oilseed growers in the region.

In February the Council partnered with the PEI Soil and Crop Improvement Association and the Department of Agriculture and Land for Cereals and Oilseeds 2023. There were many fine speakers at this event, their presentations have been recorded and are available for viewing at Cereals and Oilseeds 2023 on the AGC website. Thank you to Steven Hamill, Margaret Butcher and Heather Russell for their organizational efforts which made the conference a success.

This was the fourth year for the Yield Enhancement Network (YEN). Details on YEN are included in this Newsletter. Aaron Mills, Agriculture and AgriFood Canada has made a lasting impact with his efforts related to YEN since its inception. YEN helps to inspire us to innovate, more new varieties are being used, more disease management is happening, and overall better crops are being grown. Aaron was assisted with YEN this year by Riley Chappell, PEI, Dave Bell, NB and Catlin Congdon NS, in the collection of data for the 98 entries of oats, barley and both spring and winter wheat.

Looking ahead. AGC is developing proposals for the next 5-year block of Federal/Provincial research funding. YEN is a cornerstone for our approach, not only do we want to continue it, but there are plans to expand into corn and soybeans and to partner with the Ontario/Great Lakes YEN. Alongside YEN, the on-farm agronomy trial work also reported in this Newsletter is only possible through the funding provided by region's cereal and oilseed producers through our check-off partners and the Canadian Agricultural Partnership program.

Grain production in this region is only possible through the efforts of the many individuals who are doing their day-to-day work. Sharon ter Beek, who recently retired from AAFC Charlottetown is one such individual and is recognized in this newsletter. The Atlantic Grains Council certainly appreciates her dedication and contribution to barley and wheat variety development.

Finally as Chairman of AGC I thank the Council's Executive, Catlin Congdon, Neil Campbell, Peter Scott, Robert MacDonald and of course Heather Russell for their contribution to the work of the Council. Wishing everyone a safe, healthy, and prosperous 2023 cropping season.

Roy Culberson, Chairman,
Atlantic Grains Council

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SHARON TER BEEK – 35 YEARS OF CEREAL BREEDING EXCELLENCE

The Atlantic Grains Council and likely anyone who has benefited from cash cropping or feeding barley in Atlantic Canada, would like to thank Sharon ter Beek for over 35 years dedicated to being a cereal breeding technician with Agriculture and Agri-Food Canada.

Back in 1982, a young and energetic NSAC student was hired for a summer student position at what is now known as the Charlottetown Research and Development Centre, part of Agriculture and Agri-Food Canada's network of agricultural research stations. Sharon ter Beek (then Sharon Thompson) was a farm girl from St. Peter's Bay, PEI. After completing her diploma in Plant Science at NSAC and thus her stint as a summer student, Sharon worked as a casual employee at the research centre off and on until successfully winning a job competition for a full time research technician position in 1988. In this position, Sharon worked with wheat breeder Dr. Hans Nass and his trusted new wheat breeding technician, Allan Cummiskey to help them in their work in developing wheat varieties adapted to Atlantic Canadian growing conditions. Clearly evident that Sharon was an extremely hard worker with strong attention to detail, Sharon moved along to work for barley breeder Dr. Alek Choo as his barley breeding technician in 1992. Sharon worked for Dr. Choo for the next 24 years until Alek's retirement in 2016, together creating many popular barley varieties including; Island, Leader, AC Kings, AC Queens, AAC Azimuth and AAC Starbuck to name a few. Alek's successor, Dr. Raja Khanal picked up where Alek left off, working with Sharon to release cultivars AAC Bell, AAC Ling, AAC Madawaska and more. Some of these varieties represented the core barley varieties grown by Atlantic Canadian producers for many years.

Where retirement means slowing down and kicking back for some, this is not true for Sharon ter Beek. Anyone who knows Sharon knows that she lives by the motto; go, go, go! So for now she can be found in the barn completing chores or doing anything needed at Golden Bay Dairy in St. Peters Bay, PEI. This dairy operation is owned and operated by Sharon, her husband Erik ter Beek. Their son Jacob, a Dal AC graduate, is a critical component of the farm operation and their daughter Jennifer has inherited her parents entrepreneurial spirit and operates her own business.

Thank you Sharon for your 35 years of hard work with Agriculture and Agri-Food Canada and for your continued contribution to agriculture. You truly are an inspiration to us all.

Sharon ter Beek and Dr. Raja Khanal

YOUR LEVY DOLLARS AT WORK

Misty Croney, LP Consulting and AGC Agronomy Team

At the Atlantic Grains Council's Grain Symposium, Misty Croney provided an update *Your Levy Dollars at Work* on recent on-farm agronomy work conducted for the Grain Council including Soybean Fungicide Trial, Soybean Rolling Trial, Corn Seeding Rate Trial, Barley Nitrogen Trial, and Winter Wheat Trial. Below is a summary of the presentation. The entire presentation may be viewed under Cereals and Oilseeds 2023 on the AGC website.

Soybean Fungicide Trial

Purpose of the trial is to determine if there is a yield advantage to applying fungicide and what is the best timing.

Over 70 sites across the Maritimes 2015-2022 with fungicide treatments made using the following timing:

- R1 (1st flower),
- R2 (full flower),
- R1 and R2 (double application, added in 2018)
- control (no fungicide)

Since 2019, there were 39 fields with 152 treatments. Nineteen of the 39 fields (49%) were infected with white mold. White mold was present in 59 of 152 treatments (39%).

Across all sites Figure 1, the double application of fungicide provided an economic return when disease pressure was present. Yield difference of 0.1 t/ac (provided an economic advantage $62/ac) between control and R1/R2. However, in fields where no white mold was present applying fungicide does not increase yield.

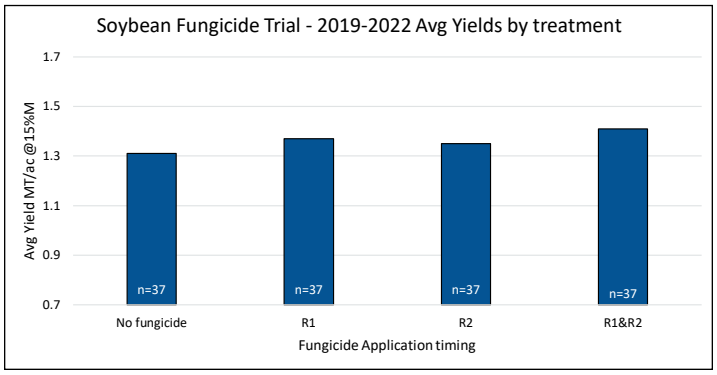


Figure 1.

Does the application of fungicides increase yield in fields with white mold?

Considering only fields with white mold in at least one treatment, there is an increase in yield with a fungicide application when the disease is present Figure 2.

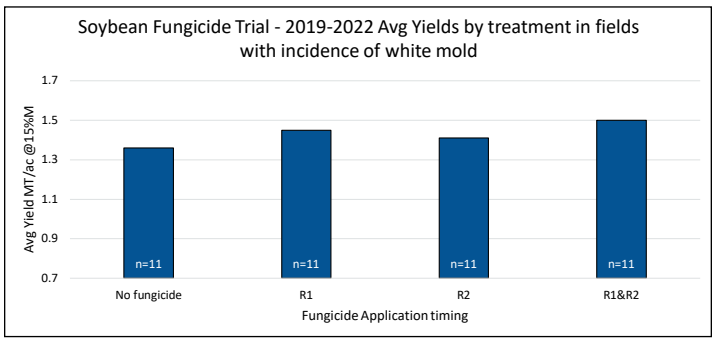


Figure 2.

With price of soybeans at $625/MT, a yield increase of 0.1 MT/ac = $62/acre. Two fungicides, Stratego Pro and Acapela were used in the trial. Costs for use were: Stratego Pro + application = $33/ac, Acapela + application = $47/ac. The price of fungicide affects ROI. Both fungicides had ROI at R1, both had loss at R2. Due to cost only Stratego Pro had ROI with double application, see Figure 3.

	R1	R2	R1/R2
Cost/acre	$33	$33	$66
Increase in Yield	0.09 t/ac	0.05 t/ac	0.14 t/ac
Valueof Yield/ac	$56	$31	$87
ROI (LOI)	**70%**	**(-6%)**	**32%**

Figure 3.

What factors increase the likelihood of white mold?

- Short rotations with soybeans every 2 – 3 years.
- Soybean fields with history of white mold should not be in rotation with potatoes, canola, pulse crops or cole crops.
- Fall tillage incorporates the spores which can survive years.
- Cool, moist conditions at flowering.

There are management options that can reduce the potential for white mold development including:

- Extend rotation with 3 years between soybeans
- Add grass to rotation
- Avoid over seeding (plant 140 - 160,000 seeds/ac)
- Plant resistant varieties
- Watch disease forecasting - fungicides
- Sanitize equipment

Summary

This on-farm trial showed that the two fungicides used can provide control of white mold and are effective to use if the disease is determined to be present. An application at R1 has the highest return on investment, if the field has a history of white mold and disease forecast is high for white mold. There are management options that help provide white mold control.

Soybean Rolling Trial

To determine if rolling will improve yield and reduce impact of rotation on yield.

2021 was the first year, with 19 sites across the Maritimes.

Treatments:

- rolling before planting
- rolling after planting
- rolling before and after planting

There was no affect on the seed to soil contact from rolling resulting in better germination, emergence or yield Figures 4 and 5.

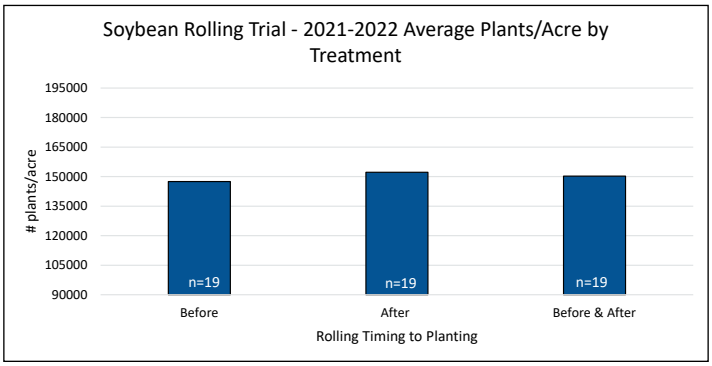


Figure 4.

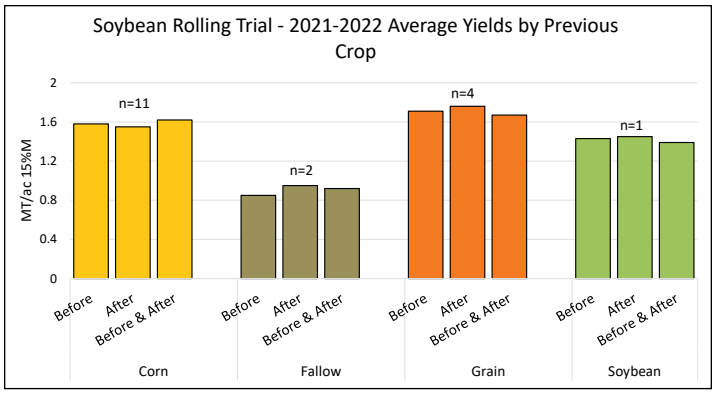


Figure 5.

Without consideration for previous crop, rolling timing did not affect the yield figure 6.

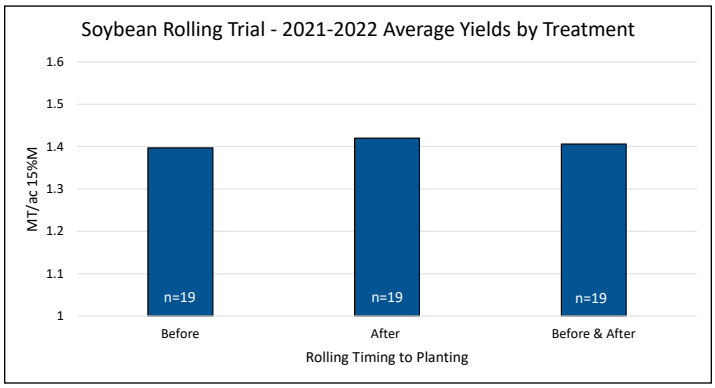


Figure 6.

Summary

Rolling timing does not affect yield. Rolling is great for smoother harvest; timing does not matter.

Corn Seeding Rate Trial

Purpose to determine if the seeding rate affects the yield.

2021 was first year of the trial with 22 grain sites and 8 silage sites. All row widths were thirty inches.

Treatments:

- 36,000 seeds/acre
- 32,000 seeds/acre
- 28,000 seeds/acre

As expected, the there was a significant difference in plants per acre for the different seeding rates.

The plants/acre for 28,000 and 32,000 targets were accurate, but 36,000 target was low.

There was no statistical difference in yield, Figures 7 and 8, but there was an economical difference. Higher seeding rate costs more. Using the cost of seed at $360/bag the cost of seed per acre was:

- 28,000 = $126/ac
- 32,000 = $144/ac (+$18/ac)
- 36,000 = $162/ac (+$36/ac)

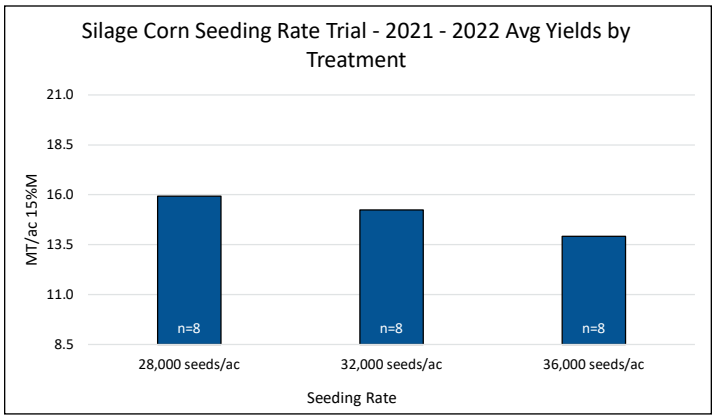


Figure 7.

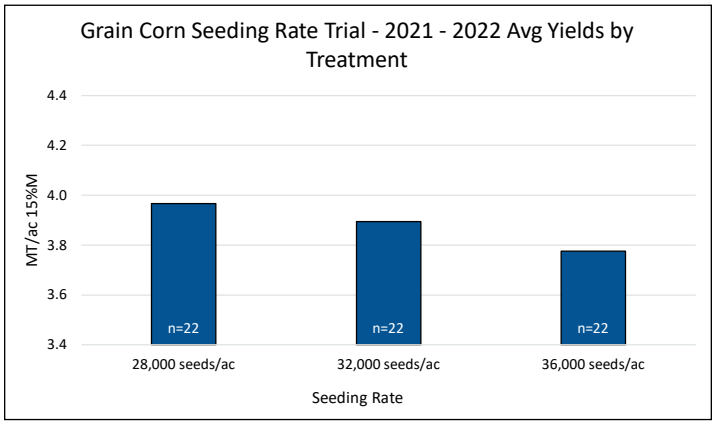


Figure 8.

Considering Grain Yield with a corn price of $425/T and an economic difference in yield of 0.2 t/ac = $85/ac. The higher seeding cost plus reduced yield at 36,000 seeds = loss of $117/acre at the highest seeding rate.

Summary

Increasing seeding rate does not increase yield, regardless of the rotation. A longer rotation has a greater affect on yield than seeding rate.

Barley Nitrogen Source and Timing Trial

Investigating application timing and source of nitrogen.

Twenty-eight sites across the Maritimes from 2019-2022.

All treatments received 80 lb/ac of nitrogen as follows:

- Urea – all at planting
- Urea – 40 lb/ac at planting & 40 lb/ac at stem elongation
- Urea/ESN – Mix 60% urea & 40% ESN all at planting
- Non-leaching Agrotain – coated urea all at planting

The two types of nitrogen fertilizer compared to Urea were: ESN (Environmentally Smart Nitrogen) and Non-leaching Agrotain (DCD).

ESN Controls the release of nitrogen through an advanced polymer coating. It releases nitrogen in response to growing conditions (protects nitrogen from loss). Note: PurYield uses same technology as ESN.

Each product has a premium price. The non-leaching Agrotain and ESN did not increase yield Figure 9. There was no significant difference in protein levels in the harvested grain Figure 10.

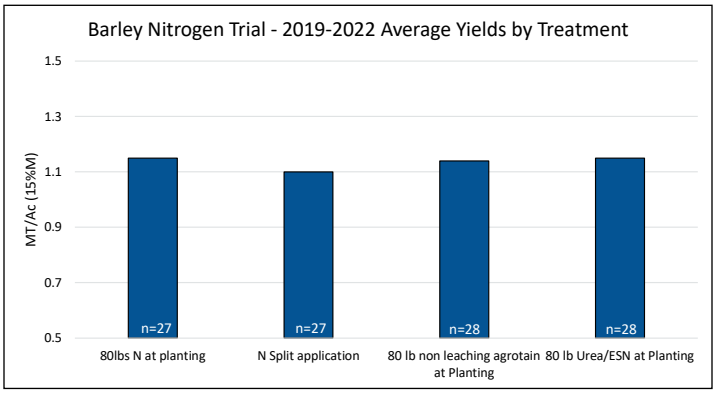


Figure 9.

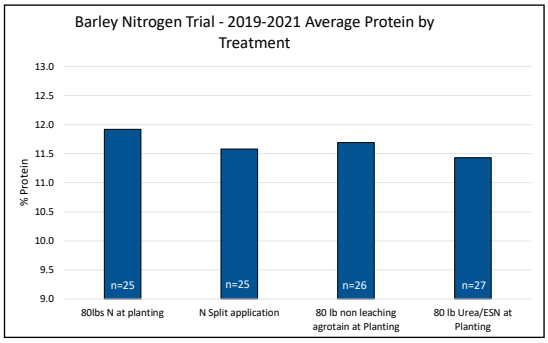


Figure 10.

Plant tissue samples were collected for analysis prior to flowering. The non-leaching Agrotain and ESN/urea had highest nitrogen tissue levels. The products work but are cost prohibitive Figures 11 and 12.

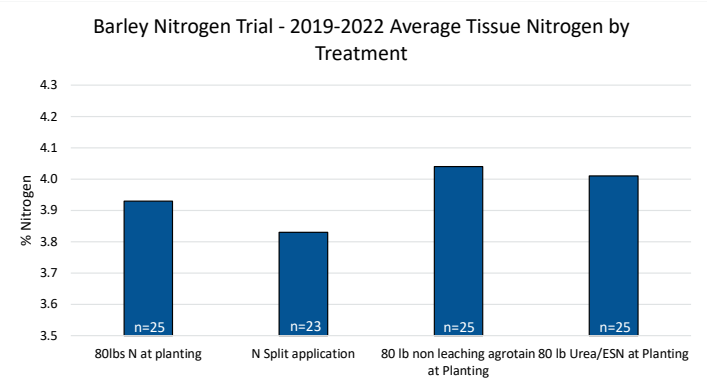


Figure 11.

	Fertilizer Cost/acre	Crop Yield Value	Net Return	Loss on Investment
80lbs N at planting	$126	$403	$277	
N Split application	$148	$385	$237	-14%
80 lb non leaching Agrotain	$172	$399	$227	-18%
80 lb Urea/ESN	$153	$403	$250	-10%

Figure 12. [1]

Why isn't there a yield response? Physical Factors such as:

- Temperature – low soil temperature decreases nitrification,
- pH – low soil pH reduces nitrification,
- Moisture – moisture closes pore space and reduces oxygen, creating anaerobic conditions,
- Oxygen and aeration – repetitive tillage degrades soil structure, reducing soil tilth and aeration,

can influence the response to nitrogen.

Summary

Nitrogen losses are very weather dependant. Products intended to prevent N loss do not always increase yield. Cost of products and use can reduce profits.

Winter Wheat Seeding Date Trial

The trial will determine if an increase in seeding rate will offset the effects of a late seeding date.

There were twenty-four sites in NS and PEI from 2020-2022. An additional eight sites were planted in the fall of 2022.

Treatments:

- Early 1.7 = 1.7m seeds/ac seeding between Sept 10th-25th
- Mid 1.7 = 1.7m seeds/ac seeding between Sept 26th-Oct 9th
- Mid 2.1 = 2.1m seeds/ac seeding between Sept 26th-Oct 9th
- Late 1.7 = 1.7m seeds/ac seeding between Oct 10th-30th
- Late 2.1 = 2.1m seeds/ac seeding between Oct 10th-30th

The early seeding had highest yields. At the mid and late seeding dates, increasing the seeding rate increased yield, but yield was still lower than the early seeding Figure 13.

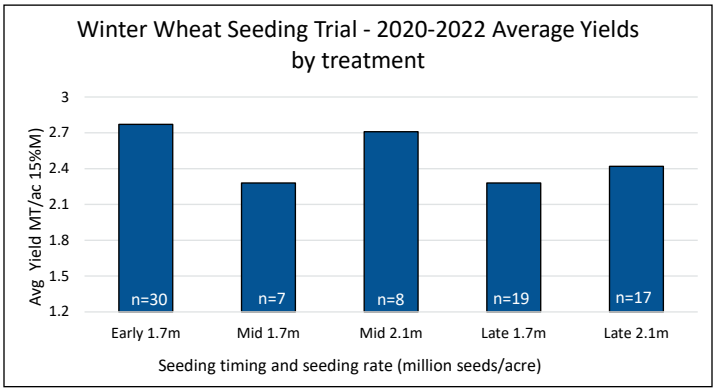


Figure 13.

How much does delayed planting cost Figure 14?

	Early 1.7m	Mid 1.7m	Mid 2.1m	Late 1.7m	Late 2.1m
Seed Cost/ac	$85	$85	$105	$85	$105
Value of Yield/ac	$1,039	$855	$1,016	$855	$908
Net	**$954**	**$770**	**$911**	**$770**	**$803**

Figure 14. [2]

Delaying planting by 1-2 weeks can cost $184/ac at same seeding rate. If delayed planting is necessary, increase seeding rate. Delaying planting by 4 weeks can cost $151/ac, even with higher seeding rate.

Summary

Plant early! Increasing the seeding rate does not compensate for delayed planting. Even if only two weeks delayed, increase seeding rate.

[1] Barley – fall of 2022 = $350/MT, Fertilizer prices 2022. Note: includes cost of extra pass.
[2] Winter Wheat – fall of 2022 = $375/MT

DO ENHANCED-EFFICIENCY NITROGEN FERTILIZERS WORK ON ATLANTIC CANADIAN FARMS?

Yunfei Jiang, Ph.D., Assistant Professor, Plant Science Honours Program Advisor
Department of Plant, Food, and Environmental Sciences, Faculty of Agriculture, Dalhousie University

Enhanced-efficiency N fertilizers (EENFs) have the potential benefits of improving crop yield and enhancing nitrogen use efficiency (NUE) while reducing N loss and protecting the environment. EENFs can enhance synchrony between soil N availability and plant N uptake demand. There are different types of EENFs, with various modes of action, including slow-release, control-release, and stabilized N fertilizers. For example, Environmentally Smart Nitrogen (ESN®) is a controlled-released urea fertilizer with a water-permeable polymer coating that gradually releases N during the growing season (https://smartnitrogen.com); SuperU® (https://kochagronomicservices.com/solutions/nutrient-protection/superu/) is a stabilized urea source with both a urease inhibitor (slow conversion of urea to NH4 – control volatilization) and a nitrification inhibitor (slow conversion of NH4 to NO3 - control leaching and denitrification).

Previous research showed that the impact of EENFs on greenhouse gas (GHG) emissions and grain yield is not consistent. The efficacy of EENFs is dependent on soil type, temperature, humidity, microbial activity, availability of water, and crop species [1]. In Atlantic Canada, a recent on-farm agronomy study for the Atlantic Grains Council, conducted by LP Consulting showed that there was no economic incentive to use the same rate (80 lb N/acre) of a blend of uncoated urea and control release urea compared to uncoated urea in barley [2]. However, the study did not evaluate if a reduced rate of controlled release fertilizer can achieve the same yield goal compared to uncoated fertilizer to offset the higher cost of EENFs. Overall, the efficacy of EENFs in different field crops in Maritime Canada has not been well-documented. Therefore, we are planning to carry out the following research plans related to EENFs in the next few years:

(1) Activity 1 – Assessment of agronomic, environmental, and economic benefits of EENFs in gain corn at multiple locations in Atlantic Canada from 2023 to 2028. The funding application is underway though Atlantic Grains Council (AGC) delivered by the Sustainable Canadian Agricultural Partnership (S-CAP). The objective of our proposed project is to evaluate the effects of different types, rates, and split application timings of EENFs on GHG emissions, NUE, grain yield, seed quality, and economic benefits, to provide recommendations to growers regarding the best type, and the optimum rate and N split application timings of EENFs in grain corn.

(2) Activity 2 (an Undergraduate Honours Project) - An undergraduate student at Dal-AC, Frouke de Backer, is going to evaluate the agronomic (i.e., NUE and tuber yield) and environmental benefits (i.e., N loss) of PurYield® (a controlled-release fertilizer) in potato production compared to uncoated urea in PEI under the supervision of Dr. Jiang. The project is a part of Frouke's summer employment with Agromart in PEI.

(3) Activity 3 – through collaboration with Dr. Aaron Mills (the main PI), Research Scientist at Agriculture and Agri-Food Canada in Charlottetown, PEI, Dr. Jiang (co-PI) will participate in a project to evaluate the influence of GHG mitigation on milling wheat quality in the Maritimes using EENFs. The funding application is also through AGC under the S-CAP program.

EENFs may be eligible for funding to cover the differential fee between standard fertilizers and EENFs under the On-Farm Climate Action Fund (OFCAF) from 2022 to 2024. We are hoping to conduct more research to see if there are both environmental and economic benefits for using EENFs. The expected results will be valuable for growers, industries, and some organizations such as governmental agencies to continue to support programs like OFCAF.

References:

1. Timilsena YP, Adhikari R, Casey P, et al (2015) Enhanced efficiency fertilisers: A review of formulation and nutrient release patterns. J Sci Food Agric 95:1131–1142. https://doi.org/10.1002/jsfa.6812

2. Croney M (2023) Your levy dollar$ at work. In: 2023 Cereal and Oilseeds Conference. Summerside, PEI

DETERMINING THE SUITABILITY OF, KERNZA® AS A GRAIN AND FORAGE IN ATLANTIC CANADA.

Brittany Cole, PhD student at Dalhousie University

Background

In 2009, The Land Institute in Kansas, US registered Kernza®, an intermediate wheatgrass selectively bred to produce a grain and forage while maintaining its perennial nature. Coming back year after year without reseeding offers Kernza® many advantages over annual grains including requiring few inputs, establishing relationships with soil organisms that aid in fertilizer uptake, and developing strong, deep root systems and continuous living groundcover that can withstand drought conditions. All of which can contribute to reducing soil erosion, improving water quality, and storing components of greenhouse gases.

The recently commercialized variety of Kernza® has reached specialized markets in the Midwest, as well as received attention from Patagonia Provisions (the food side of the well-known Patagonia clothing company) and General Mills which has led to the production of multiple food products and a few beers. With close to 4000 acres in active production in 2021, the market interest is exceeding supply.

A 2019 study identified the common concern for growers experimenting with Kernza® on their marginal land was the weed pressure in the seeding year; due to the slow growth of perennials in the first year, land with established weed seedbanks can be visually alarming. However, Kernza® quickly overshadows most weeds following its first winter. Overall, growers valued Kernza® for the dual-purpose grain and forage, as well as the ability to graze. All that remains to make this crop successful is to regionally define the production guidelines, and globally expand production land and markets.

Kernza® seed.

2022 seeded Kernza® plot.

Trial methods

A project at Dalhousie University, funded by Agriculture Climate Solutions New Brunswick (ACS NB) in collaboration with Agriculture and Agri-food Canada, started in spring 2022 and established the first Kernza® research plots in all three Maritime Provinces. Using cultivation practices from other regions, this project is looking into the suitability of Kernza® for our Maritime climate and the best agronomy for local cultivation, including spring vs fall seeding, narrow or wide row spacing, seeding rate, and harvest index associated with spring forage harvest.

First year observations have highlighted the same grower issues from 2019: weed pressure was strong in the summer months, mainly crab grass, mustard, and corn spurry. By the end of the growing season, Kernza® had pushed through the competition and was looking lush with 2-5 tillers and long leaves.

In spring 2023, the 2022 seeded Kernza® will receive the first forage harvest. Forage quality has been shown to have a higher crude protein, dry matter digestibility, and metabolizable energy than annual winter wheat. This summer, plots will also receive the first grain harvest. We are expecting similar yields to other Canadian plots of around 600 kg/ha. While this yield seems low compared to annual crop grain yields, continued research and on-farm trials are identifying the best agronomy to boost economic value, such as incorporating a cash crop in the Kernza® establishment

year and exploring the benefits of harvesting grain and forage from one field.

Weed pressure in 2022 Kernza® seeding year plots between summer (left) and late fall (right).

With some winter wheat fields hit hard by rust in 2022, early signs of the disease on adjacent Kernza® leaves quickly disappeared with summer rains. Few diseases and pests are known to impact Kernza®; based on the first year established in the Maritimes, Kernza® shows some promising resistance. If this trend continues, Kernza® may be a beneficial option to include in crop rotations as expected disease and pest pressures become more variable with climate change.

Impact on local agriculture

A recently established New Brunswick rotation study comparing Kernza® in a 3-year potato rotation to annual grain and common forage rotations will demonstrate the benefits of including perennial grains in annual crop rotations. We expect that Kernza® will not impact potato yield, but will reduce greenhouse gas emissions and improve soil health, which may increase farmer resilience to climate change. This study will also identify the economic value added by Kernza® through grain and forage production. The next step is to move Kernza® trails on-farm to marginal land.

This project provides the introduction of one perennial grain into Maritime agriculture, but there are several other perennial crops being developed globally that may be well suited for our region. Identifying alternative crops is one component of strategic plans to ensure the agriculture industry is sustainable. Continuing to explore valuable options for producers is our goal.

For more information on Kernza®: https://kernza.org/

FINE TUNING YOUR CEREAL DISEASE MANAGEMENT TOOLBOX

Kelly Turkington, Plant Pathologist,
Agriculture and Agri-Food Canada
Lacombe Research and Development Centre

At Cereals and Oilseeds 2023 Kelly Turkington reviewed some ways that Atlantic Canadian cereal producers can use disease management tools to reduce the impact of cereal disease such as: scald, net blotch, spot blotch, stripe rust, septoria and Fusarium head blight (FHB) which often elevates Deoxynivalenol (DON) levels. The entire presentation is available on the AGC website.

Summary

Control of cereal diseases can take place when a producer influences one or more of the components of the Disease Triangle, Figure 1, by using the available tools including:

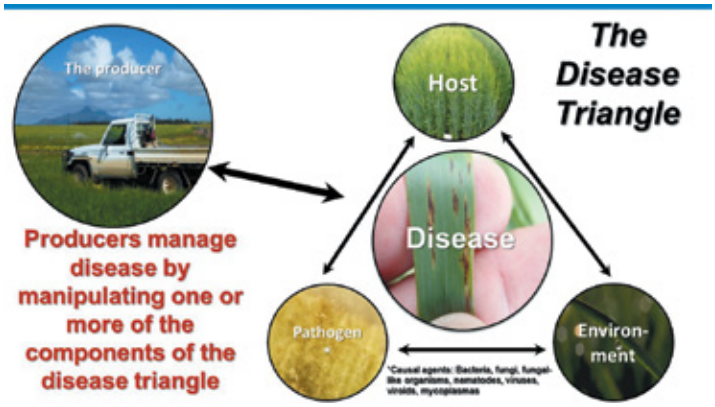


Figure 1. The Disease Triangle

1. Resistance
   - Use the current *Maritime Cereal Cultivars Performance Trial Report* to assess both a cereal varieties disease resistance and yield characteristics. Selecting a variety with enhanced resistance to expected diseases automatically builds in a degree of protection.
2. Seed
   - Use quality seed and seed treatment.
   - Adequate seeding rates, with good germination leads to more uniform head

emergence and can improve FDK, and DON management.

- Monitor grain which may be used for seed.

3. Rotation
   - Know that there is an enhanced risk of disease occurrence with tight crop rotations, especially if crop residue remains on the soil surface.
   - Two years between host crops is a minimum. A single year between host crops is not sufficient for adequate decomposition of infested crop residues.

4. Fungicides
   - Typically need to be applied before extensive disease development - Limited activity on well-established infections.
   - Need to be applied directly to the plant tissues you want to protect - Typically do not move from one leaf to another.
   - Effective for up to 2-3 weeks.
   - Need right timing, right target, right product, right rate.
   - Focus more on the mid-latter part of the FHB label application window, see figure 2.

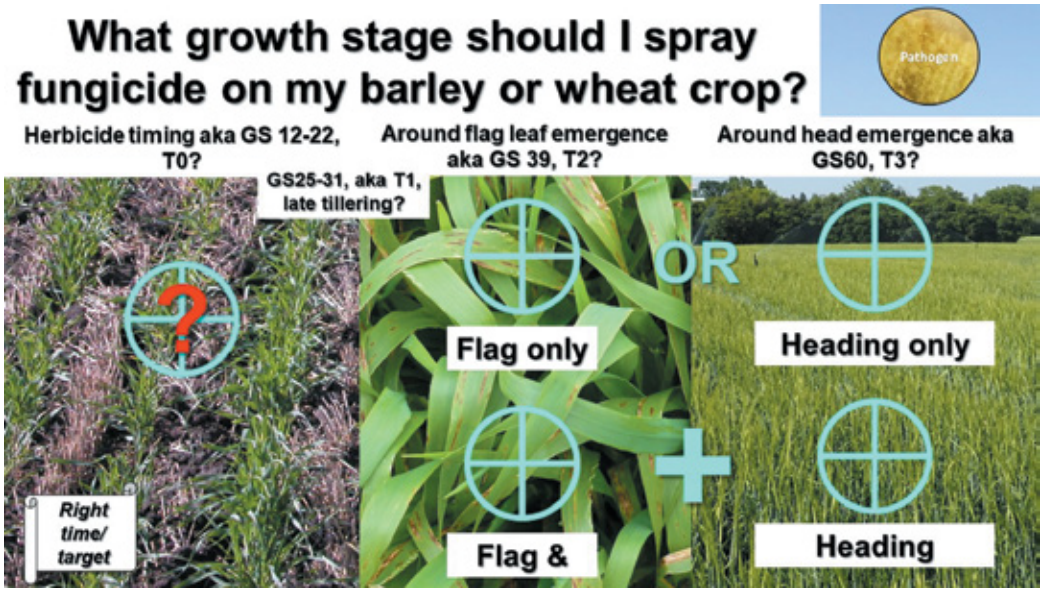


Figure 2. Fungicide timing

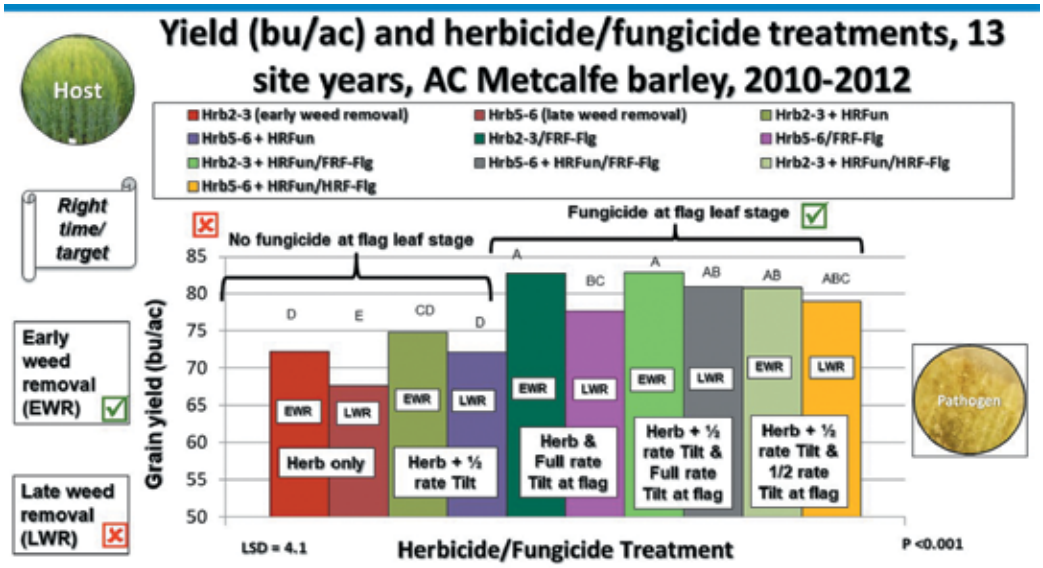


Figure 3. Impact of fungicide treatment

- Scouting for leaf spot and rust diseases from tillering to head emergence can help to identify emerging issues and the proper timing for a fungicide.
- Need to consider pre-harvest intervals and the economics of fungicide use.Addressing both FDK and DON management may require a change in mindset, regulations, and/or chemistries.

Turkington reported that using a fungicide to protect the flag leaf provided effective disease control and enhanced yield see figure 3. Herbicide timings for fungicide did not protect key upper canopy leaves.

CEREAL AND SOYBEAN PROFILE – CANADA AND THE MARITIMES

Estimated Field Crops Area, Production and Value - Canada and Maritimes, 2022[1]

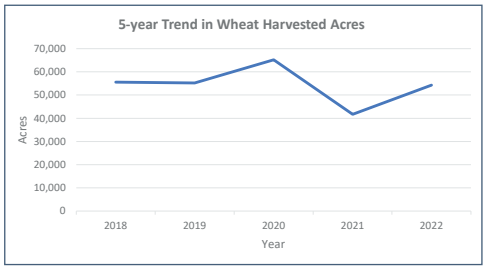
Crop	Acres/Production Value	Canada	New Brunswick[2]	Nova Scotia	Prince Edward Island[3]	Maritimes
Wheat	Area ac	24,912,900	9,000	6,100	39,160	54,260
	Production t	33,823,683	13,428	12,546	74,464	100,438
	$ Value	14,314,816,380	5,639,760	859,200	31,275,300	42,183,960
Oats	Area ac	3,464,500	28,400	1,700	5,431	35,531
	Production t	5,226,465	39,319	1,680	6,179	47,178
	$ Value	1,907,659,725	14,351,435	613,200	2,255,335	17,219,970
Barley	Area ac	6,513,100	13,900	1,700	58,494	74,094
	Production t	9,986,681	19,884	2,148	88,840	110,772
	$ Value	3,994,672,400	7,953,600	859,200	35,536,000	44,348,800
Corn	Area ac (Grain)	3,568,200	11,900	16,200	15,400	43,500
	Area ac (Silage)	688,700	7,300	13,800	10,500	31,600
	Production t[4]	14,538,878	42,857	47,740	52,300	142,897
	$ Value[4]	4,652,440,960	13,714,240	15,276,800	16,736,000	45,727,040
Soybean	Area ac	5,233,500	9,900	13,600	30,500	54,000
	Production t	6,543,158	10,200	17,079	44,819	63,336
	$ Value	4,514,779,020	7,038,000	11,784,510	25,546,830	43,701,840

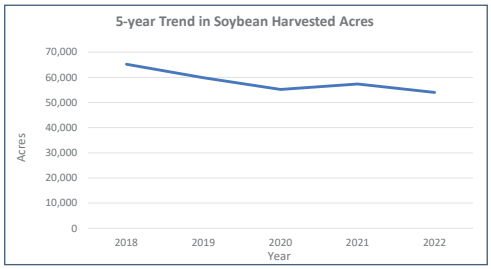
[1] Data derived from Statistics Canada Table 32-10-0359-01, released December 2, 2022, and Agriculture and Agri-Food Canada's *Canada: Outlook for Principal Field Crops* released December 22, 2022.
[2] New Brunswick soybean acres not reported by Statistics Canada in 2022, soybean area and yield estimated based on industry consultations.
[3] PEI harvested corn acres for both silage and grain not reported due to post-tropical storm Fiona, estimated harvested areas based on historical relation of planted to harvested acres. Yields based on ratio of PEI yields for grain and silage to Nova Scotia.
[4] Only tonnage and value is reported for corn harvested as grain.

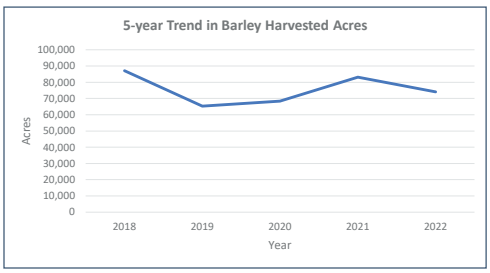
Maritime field crop production is valued at over $190 million for 2022.

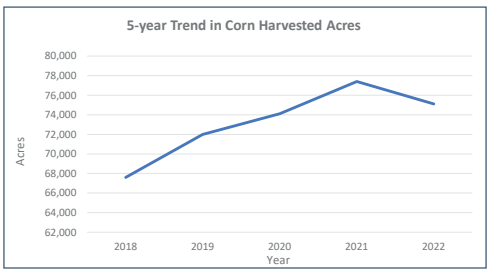
The graphs showing the harvested acres for major field crops over the past five years show a slight decline in acres. In 2018 there were 310,400 harvested acres for wheat, oat, barley, corn, and soybean. Harvested acres declined by almost 27,000 acres in 2019 but have since rebounded to over 295,000 acres in 2022.

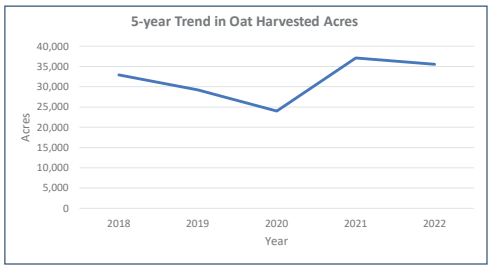
Corn harvested either as grain or silage has exceed 70,000 acres in each of the last 4-years. Wheat area was almost identical in 2022 to 2019, but winter wheat now represents approximately 45% of the harvested area compared to 28% in 2018.











YIELD ENHANCEMENT NETWORK REVIEW

Dr. A. Mills, Agriculture and Agri-Food Canada, Atlantic Grains Council Agronomy Team

In 2019 the Atlantic Grains Council (AGC), Agriculture and Agri-Food Canada (AAFC) in collaboration with ADAS developed an Atlantic Canada Yield Enhancement Network (YEN).

More than an interesting way to spark a friendly competition, YEN is addressing improved yields, building crop management expertise, and providing farmer leadership concerning crop research and management.

YEN builds on the age-old concepts of producer competitions, keeping an eye on your neighbour, and being able to learn from what each other is doing.

Another element of YEN, and what makes it unique, is the crop model that drives the information. This model calculates the solar energy available and water availability of each field and provides an estimate of the theoretical potential yield. In other words, this is the measure of how well a farmer does with the cards they are dealt by nature on a field-by-field basis.

Information, measuring and reporting through YEN, provides the producer with a tremendous amount of data about their crop: plants per acre, number of tillers per plant number of heads per sq. ft., the number of kernels per head and the kernel weight along with the components that go into calculating the potential yield of each individual field. Each YEN producer receives a detailed report summarizing their crop performance and providing comparisons about their crop to others in the competition.

Since 2019 YEN has grown from the 34 entries in two crops to 98 entries in four crops (spring and winter wheat, barley, and oats) in 2022.

After four-years of YEN, the collective data is now providing insights into cereal production across the Maritimes. Figure 1, shows a trend that YEN participants appear to be increasing yield, especially true for spring and winter wheat which have four years of measurement.

The yield increase seen in winter wheat over spring wheat is likely due to the proportion of certified winter

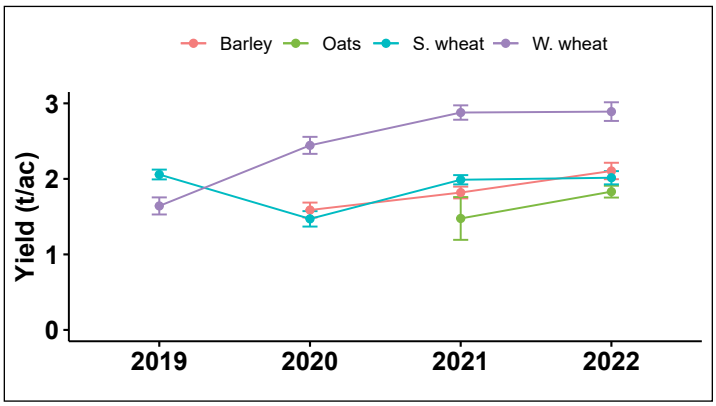


Figure 1.

wheat seed used over spring wheat, where almost half of the seed planted was non-certified. Additionally, winter wheat growers seem to be more open to using newer varieties fresh out of the pipeline.

The trends show that the use of certified, compared to non-certified seed (figures 2 and 3) show a clear yield advantage to using certified seed.

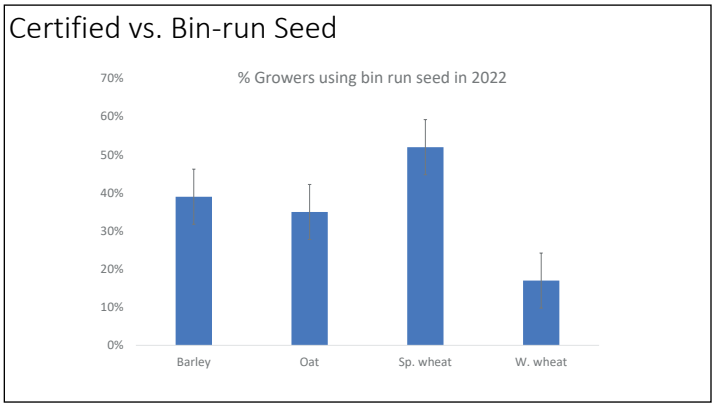


Figure 2.

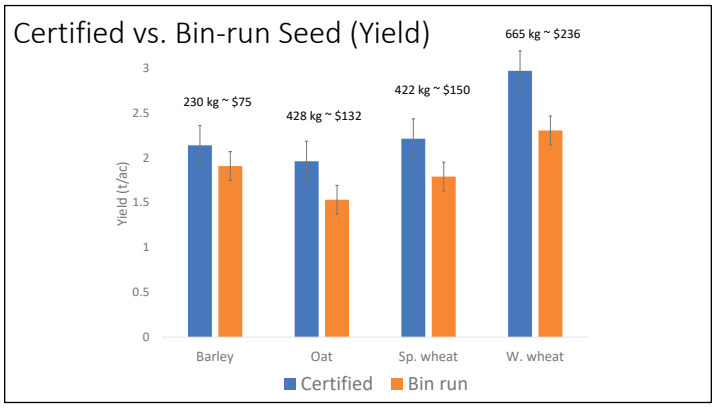


Figure 3.

The ADAS model used to calculate potential yield assumes a 60 cm rooting depth for available soil

moisture. Soil surveys form the 1980's in PEI indicated that root depth was a maximum of 60-80 cm. Data collected through YEN is indicating that current rooting depth for cereals is lower, approximately 43 cm. This suggests that at least 1/3 of the soil that was there in the 80's is now gone forever. Lower than expected soil root depth has significant implications on cereal yield, Figures 4 and 5. This information, combined with the success of YEN entrants who practice no-till, reinforce the importance of limiting tillage and incorporating cover crops into your crop production system.

Figure 4. *Root depth measurement*

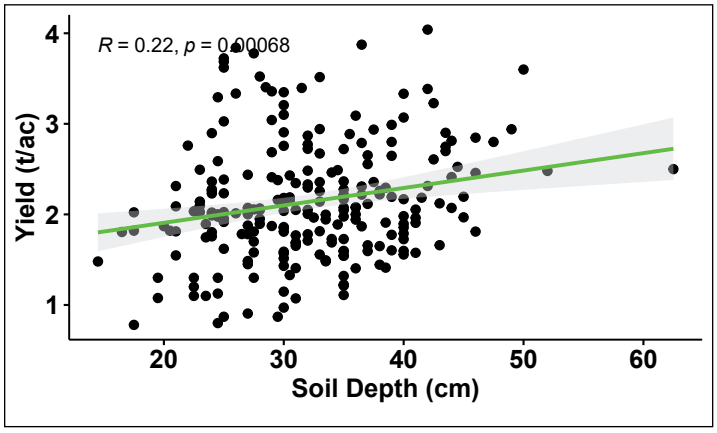


Figure 5. *YEN measured root depth*

YEN is already influencing cereal management, Figure 6 indicates that early-planted winter wheat yields best with a plant population of 1.5 to 1.8 million plants per acre. Although yield can be saved by increasing seeding rate as the planting date gets later, early planting is a major driver of winter wheat yield. Earlier planting gives the plant a chance to form tillers in the fall rather than the spring.

With spring wheat, the rate needs to be higher (Figure 7) as tillering tends to take away from yield and a higher seeding rate is required to limit tillering and increase the number of true heads per square foot.

Similar trends are coming out of the barley and oat data, but more data points are needed.

[1] ADAS established 75 years ago, is a UK based advisory service delivering on national and international projects in a wide array of industries.

The collection of data on real farm situations through YEN will ensure a sound base for decision making and build resiliency for crop production in the region. YEN allows participation in a network that can rapidly transfers production knowledge between participants allowing producers to understand how expensive inputs can be best utilized.

The use of specific inputs such as nitrogen for crop production is under pressure for environmental reasons. The YEN data are showing producers how important the 4Rs are for nitrogen use efficiency (NUE). This year participants were awarded for the greatest nitrogen use efficiency for each of the four crops in the competition. Interestingly enough, the highest NUE for winter wheat actually happened to be the highest overall yield in the competition. This suggests that both high yields and nitrogen use efficiency can be achieved simultaneously.

For information regarding participation in the 2023 Yield Enhancement Network please contact: Heather Russell, Atlantic Grains Council heather@atlanticgrainscouncil.ca 506-380 -9663 or Aaron Mills, Agriculture and Agri-Food Canada aaron.mills@canada.ca 902-314-7949.

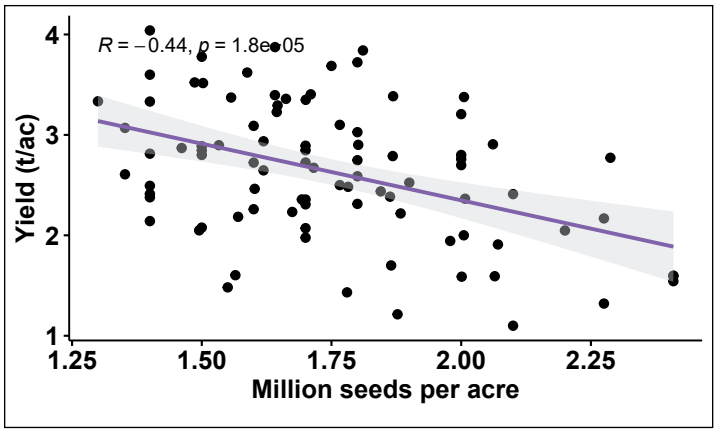


Figure 6. *Seeds per acre winter wheat*

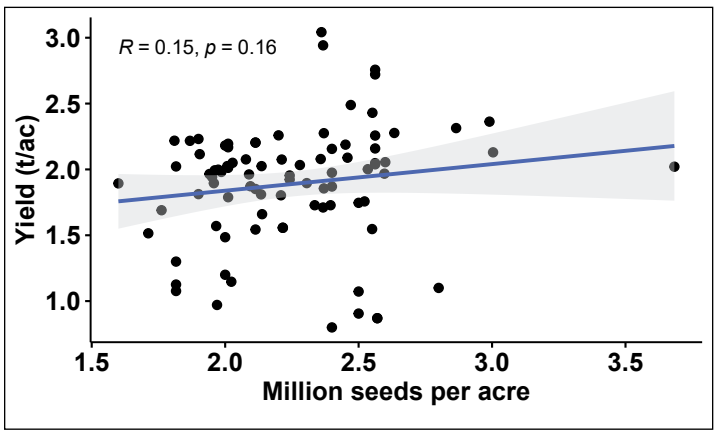


Figure 7. *Seeds per acre spring wheat*

YIELD ENHANCEMENT NETWORK (YEN) AWARDS

AGC Agronomy Team

Highest total yield – Barley, L to R, Eric Theriault, Gold, Kyle Jewell, Silver, Mark Nabuurs, Bronze.

YEN is a joint effort of Agriculture and AgriFood Canada, the Atlantic Grain Council and the participating farmers, which highlights the importance of sharing information to improve both on-farm and regional cereal productivity. On February 7, 2023, the Atlantic Grain Council hosted the fourth YEN Award meeting. The awards recognized those cereal producers from across New Brunswick, Nova Scotia and Prince Edward who did an outstanding job in managing their wheat, barley and oat crops. The Awards were based on data collected from the 98 fields entered in the competition by the 45 participating farms.

The Awards are broken down into three categories for each of the four crop kinds: spring wheat, winter wheat, barley and oats. The first category is for the highest recorded total yield in metric tonnes per acre (t/ac). The second category is for highest potential yield, calculated by comparing the actual crop yield to the calculated potential yield based on the amount of rain and sunlight and is reported as a percentage. The third category, which new for 2022 looks at how efficiently applied nitrogen was converted to harvested crop and is reported as kilograms of grain per kilogram of applied nitrogen (kg grain/kg of N).

Winter wheat total yield, L to R Kyle Jewell – Bronze, Niels Langelaan – Silver, Joey Van de Riet – Gold.

This year's winners were:

Highest total yield – Spring wheat

- Gold: Leonard McIsaac (PE) – 3.04 t/ac
- Silver: Kevin Floyd (NB) – 2.94 t/ac
- Bronze: Spencer Ellis (PE) – 2.36 t/ac

Highest percentage of potential yield – Spring wheat

- Gold: Leonard McIsaac (PE) – 61%
- Silver: Kevin Floyd (NB) – 55%
- Bronze: Anthony Nabuurs (PE) – 47%

Best nitrogen efficiency – Spring wheat

- Gold: Eric Thériault (NB) – 65 kg grain/kg N
- Silver: Craig Wallace (PE) – 53 kg grain/kg N
- Bronze: Kevin Floyd (NB) – 44 kg grain/kg N

Highest total yield – Winter wheat

- Gold: Joey Van de Riet (NS) – 3.84 t/ac
- Silver: Niels Langelaan (NS) – 3.72 t/ac
- Bronze: Kyle Jewell (PE) – 3.69 t/ac

Highest percentage of potential yield – Winter wheat

- Gold: Chris Vissers (NS) – 77%
- Silver: Joey Van de Riet (NS) – 76%
- Bronze: Niels Langelaan (NS) – 73%

Best nitrogen efficiency – Winter wheat

- Gold: Joey Van de Riet (NS) – 68 kg grain/kg N
- Silver: Ben Visser (PE) – 64 kg grain/kg N
- Bronze: Leonard McIsaac (PE) – 58 kg grain/kg N

Highest total yield – Barley

- Gold: Eric Thériault (NB) – 2.99 t/ac
- Silver: Kyle Jewell (PE) – 2.69 t/ac
- Bronze: Anthony Nabuurs (PE) – 2.65 t/ac

Highest percentage of potential yield – Barley

- Gold: Doug Stone (NS) – 58%
- Silver: Anthony Nabuurs (PE) – 56%
- Bronze: Kyle Jewell (PE) – 55%

Best nitrogen efficiency – Barley

- Gold: Eric Thériault (NB) – 95 kg grain/kg N
- Silver: Eric Thériault (NB) – 81 kg grain/kg N
- Bronze: Jean Lynds (NS) – 75 kg grain/kg N

Highest total yield – Oats

- Gold: Greg Carpenter (NB) – 2.35 t/ac
- Silver: Andrew Cummings (NB) – 2.30 t/ac
- Bronze: Eric Thériault (NB) – 2.22 t/ac

Highest percentage of potential yield – Oats

- Gold: Greg Carpenter (NB) – 43%
- Silver: Andrew Cummings (NB) – 42%
- Bronze: Robert Culberson (NB) – 40%

Best nitrogen efficiency – Oats

- Gold: Keir Miller (NB) – 158 kg grain/kg N
- Silver: Eric Thériault (NB) – 92 kg grain/kg N
- Bronze: Kevin Floyd (NB) – 85 kg grain/kg N

Background information, details and video concerning the Yield Enhancement Network is available to view on the AGC website including the YEN presentation and discussion at the Grain Symposium.

For information regarding participation in the 2023 Yield Enhancement Network please contact: Heather Russell, Atlantic Grains Council heather@atlanticgrainscouncil.ca 506-380-9663 or Aaron Mills, Agriculture and Agri-Food Canada aaron.mills@canada.ca 902-314-7949.

Highest potential yield winter wheat L to R, Niels Langelaan – Bronze, Joey Van de Riet – Silver, Chris Vissers – Gold.

A SNAPSHOT OF THE AGC SECTOR OUTLOOK PROJECT

With the growth and development in the grain and oilseed sector over the past ten years, the Atlantic Grains Council(AGC) wanted to take a look into the future. What would the grain and oilseed sector look like in the next five years – would it be smaller, larger, more focused or more diversified.

The intent of the project is to provide a framework of how the sector is expected to change based on both research and input from people across the sector. Based on this information we would describe the sector's potential in the region. This would help to better understand how growing grain and oilseeds in the region contributes to:

- the economy
- the livestock sector
- the seed sector
- the export sector and
- value adding.

The following is a short summary of some of the trends we see impacting our sector into the future.

Alan Miller and Rod Nicholson led the project, which commenced in August 2020, shortly after Covid 19 restrictions commenced. It wraps up this spring.

Climate trends for the Maritimes

There is a large information base building around climate trends. The UPEI Climate Lab was a major contributor to our analysis.

Based on the evidence, the temperature has been and will continue to rise. To dig a little deeper, the rate of the temperature rise is increasing – it rose 0.5°C in the last 100 years and is expected to rise 1.5°C in the next 30 years. This will result in more growing degree days for the Maritimes as well as more "hot" days in the summer. We also expect our winters to be milder in general with less "cold" days. For moisture, the yearly total will remain similar, however, the distribution of this precipitation will be challenging with fewer larger rainfall events. Changing climate will result

in longer growing seasons, unpredictable moisture in the summer and more extreme events such as Dorian and Fiona. The climate trends are "clear" and overall – looks positive for grain and oilseeds in the Maritimes – our challenge will be the fluctuations each year - this will not be a straight line transition.

Crop Production and Feed Demand in the Maritimes:

We have completed an in-depth review of the production base in the Maritimes and compared it to the feed demand in the region. The following Table shows a summary of both production and feed demand estimates in metric tonnes for the Maritimes for 2021.

Crop production and Feed Demand - Maritimes

Crop	Production (MT)	Feed Demand (MT)
Corn	131,500	190,600
Soybean	72,600	70,100
Wheat	68,700	26,600
Barley	119,000	112,600
Oats	48,700	41,600
Total	440,500	441,500

These estimates do not account for exports and imports into the region, however, at a high level, the total production mirrors the feed demand. For individual crops there is a deficit of corn grown in the region and a surplus of wheat and to a lesser extent oats.

Since starting the project in 2020 the world has changed very much which has impacted the directions of the report. It has become much more unpredictable and extreme. Dorian, which was cited as a once in a hundred-year event was soon followed by Fiona – with even more severe damage to buildings and land. While the food supply system more or less stayed intact during Covid, vulnerability of supply chains and our food system were exposed.

Russia's Invasion of Ukraine:

We are now in the midst of the largest war since World War II. This war is galvanizing alliances, regionalizing the world and weaponizing energy, food and agricultural inputs as well as targeting citizens. The cost, complexity, and resource drain of rebuilding all of the damage caused by the war is not on the agenda yet.

Further impacts from this war include:

- Fracturing of global relations
- Inflation and rising interest rates
- Transportation fragility
- Slipping of global climate targets
- Rising cost / price of agricultural inputs and commodities

All of this is raising the profile and importance of food security.

Summary

Over the next several years we will see a general retreat from globalization. This will happen geographically and financially and will regionalize trade. Individual citizens are needing to retrench – as money becomes tighter – consumers will look to the basics and will have to make tougher choices on what they can and cannot afford anymore.

The climate for business has changed dramatically and will remain volatile. While securing and shipping global orders was routine up until 2020, it is no longer the case. The further you ship the higher the risk and cost. The local and domestic market is looking attractive and is stable compared to far away markets. Local is seen as a strong platform to consider exporting from. Finally, demand for most products is exceeding supply, including inputs, energy, labour and commodities. This is not expected to change significantly in the near term. In the longer term when supply may exceed demand – this will not happen smoothly.

As we consider the recommendations for this project, it is clear that we need to reflect how we:

- take advantage of our potential climate advantage
- better align our local production to our new climate and to nearby markets
- make our local production more attractive to local and near local buyers
- adapt to the new world order of exporting.

ATLANTIC GRAINS COUNCIL MEMBER UPDATE

Michael J Delaney

I am pleased to continue to represent the Atlantic Grains Council as your Board of Director delegate on the *Grain Growers of Canada, Soy Canada, and Cereals Canada.*

Grain Growers of Canada http://www.ggc-pgc.ca/
Governments as seen by the programs they have authorized and implemented are now prioritizing climate change and related environmental, soil health, biodiversity & sustainability issues in terms of importance. Global food insecurity has also been added to the agenda. This trend has accelerated through 2022 and into 2023 particularly with nitrous oxide emissions and carbon sequestration emerging as issues of interest.

AGC acknowledges GGC efforts on behalf of Canadian farmers, supply, and value chain members to advocate for minimized or reduced carbon tax impacts. Grain drying and barn heating fuel are highlighted as policy examples of positive legislation influence.

GGC has been focused; along with other entities such as the Roundtable on Sustainable Crops on forming a coalition of members and experts to ensure that Canadian farmers; including ***us here in the Atlantic region*** are seen as global leaders in terms of being recognized as producers/exporters of sustainable crops and a source of best management feed and food crop production practices leading to reduction and net-zero emissions by 2050.

As well, GGC members contribute the crop volumes making Canada the 5th largest global crop exporter with further potential to grow. While the bulk of our Atlantic production is for regional domestic and livestock consumption, global food insecurity and export markets are also an issue for us!

GGC also continues to monitor safety net policy, trade, and transportation issues.

- *Business Risk Management programming* (BRM) is based on a 60/40 federal provincial funding ratio. GGC recommends that you join them on following federal / provincial reform of BRM programming and provide advice as in the past and appropriate; that maximizes effectiveness and avoids cross compliance with climate related issues.
- I chair the GGC trade and marketing committee. *National trade growth and market access assurance* ensures that domestic supplies of crops are utilized for export where possible which keeps our localized production in stronger demand.
- *Atlantic transportation issues* are unique. AGC advocates to GGC and others that further acknowledgement and support for our region is required.

Soy Canada https://soycanada.ca/
Soy Canada is a supply chain structured national organization: Farmers, handlers, buyers, sellers and processors are all members. Our membership fee is nominal compared to the information and, value they provide us with. AGC is an alliance based member without a "formal" Soy Canada Board seat. Soy Canada keeps us informed regarding national issues of interest. For example, the soybean sector wants to do more internal processing as opposed to raw crop exports. As a clean bio-fuel source, soy market demand is increasing. Soy Canada, Executive Director Brian Innes consults with our Executive Director Heather Russell and AGC Vice-President Neil Campbell frequently. Brian is easily accessible and knowledgeable!

Soybeans are an important regional crop, having strong local prices and positive Atlantic regional demand as a livestock feed additive. Concerning exports Soy Canada is supportive of an audit that articulates sustainable soybean production and handling practices. For example, Atlantic producers that want to export food grade soybeans to Quebec, need to be aware of; and comply with these requirements.

Soy Canada also keeps track of and documents on-line, Canadian soybean production data by province. They represent sector policy issues with the Federal & Provincial Governments as required. They are also working with provinces as in Western Canada to encourage quality and volume increases. Lastly, they provide regional access to soybean quality sampling and evaluation as required.

Cereals Canada https://cerealscanada.ca/
AGC is a participant with the value chain organization

Cereals Canada. Ontario and Quebec Board members represent our Atlantic interests as appropriate. They participate with the Western provinces and related sectors. The Canadian Millers Association recently joined.

- Cereals Canada in collaboration with the Canada Grains Council has been working closely with corn, soybean, pulse, barley, and oat organizations with respect to crop protection, product evaluation and export market maximum residue level (MRL) certification.

- Their policy assistance also helped Eastern Canada negotiate enhancements to the Canada Grain Commission regulations concerning varietal certification for export in accordance with the CUSMA trade agreement. which Eastern Canada has since resolved.

- Cereals Canada has done an excellent job with the Canadian International Grains Institute in promoting Canadian wheat to export markets. In February 2023 "Combine to Consumer plate" information session will held. AGC members can participate and an expense share for our member attendance is available.

- AGC participated in a Cereals Canada led a national coalition to identify wheat research priorities including *yield enhancement, plant breeding technology(s) approval, food safety, sustainability options and consumer end use options.*

- Coming soon is a member dialogue on wheat sustainability practices.

In addition, AGC also builds alliances with other organizations such as Grain Farmers of Ontario and Quebec. As an example, AGC is pleased to have supported Atlantic farmers, the Grain Farmers of Ontario and Quebec, in advocating that the federal government *must* refund the illogical tariff placed by Canada, on imported fertilizer from Russia. The tariff had a minimum impact on Russia as a supplier but negatively impacted the competitiveness of Canadian farmers through fertilizer cost increases. Exploring other alternative fertilizer import sources other than Russia is also being encouraged!

CHOOSING COVER CROPS IN ATLANTIC CANADA

Andrew McKenzie-Gopsill, PhD, Weed Scientist,
Agriculture and Agri-Food Canada, Charlottetown PE

Cover crops are becoming important components of many producers' rotations. Traditionally, cover crops have been thought of as tools to combat erosion and improve soil heath. Cover crops can also be used to provide a variety of agroecosystem services, such as scavenging excess nutrients, and disease and weed suppression. The choice of which species to grow or if to sow a mixture depends on the desired outcomes and the logistics of how and when a cover crop will be incorporated into a production system.

Cover crop biomass production is highly correlated to the provision of agroecosystem services. Over the past five years, researchers with Agriculture and Agri-Food Canada in Charlottetown have been evaluating a large panel of cover crop species and mixtures grown for a full season to assess their productivity and suitability in Atlantic Canadian cropping systems. We selected a range of species including those producers would be familiar with, such as oat, red clover, and buckwheat, as well as those they may not be as familiar with such as teff, galega, and phacelia (Table 1). Seeding rates of species were halved in mixture with the exception of buckwheat which was divided by three. Cover crops were sown in late June of each year, flail mowed in the fall, with residue left on the soil surface over winter. All cover crops were sown with a grain drill in 6" rows. To evaluate and isolate the carry-over effects of cover crops, we direct seeded soybean into cover crop stubble the following growing season with no additional management. We evaluated cover crop biomass production and weed suppression in the cover crop year and spring soil cover, weed suppression, cover crop volunteering, and soybean yield in the soybean year.

We found that cover crop species varied widely in their biomass productivity and ability to suppress weeds. Cover crops that were consistently productive included: oat, pearl millet, sorghum-sudangrass, buckwheat, phacelia, tillage radish, and oilseed radish (Figure 1). These cover crop species produced on average between 400 and 600 g m-2 of dry biomass which resulted in a 75-99% reduction in weed biomass (Figure 2).

Table 1: List of cover crops, abbreviations, and seeding rates used in the study. Note, seeding rates were adjusted for germination percentage, those listed represent unadjusted seeding rates.

Cover crop	Abbreviation	Seeding rate (lbs/acre)
Alfalfa	MEDSA	18
Crimson clover	TRFIN	13
Galega	GAGOF	9
Fababean	VICFX	36
Field pea	PIBSX	160
Hairy vetch	VICVI	18
Red clover	TRFPR	9
White clover	TRFRE	9
Annual ryegrass	LOLMU	18
Oat	AVESA	90
Pearl millet	PESGL	22
Sorghum-sudangrass	SORSU	36
Teff	ERATF	9
Timothy	PHLPR	9
Brown mustard	BRSJU	5
Oilseed radish	RAPSO	9
Tillage radish	RAPSR	7
Buckwheat	FAGES	44
Phacelia	PHCTA	9
Sunflower	HELAN	3.5

Regardless of the number of species in a mixture, however, weed suppression was highly correlated to cover crop biomass productivity. Fast-growing cover crops which rapidly develop full canopies such as buckwheat are particularly effective at suppressing weeds. Further, increasing the number of species in a cover crop mixture did not improve cover crop biomass productivity but did improve year-over-year stability in biomass accumulation. Mixtures were not on average more weed suppressive than the most weed suppressive monocultures such as buckwheat, sorghum-sudangrass, or pearl millet. Our results suggest that if weed suppression is the ultimate goal, a highly productive fast growing cover crop monoculture may be the best option. Yet, including highly productive species in mixture can be a bet-hedging strategy to ensure consistent year-over-year biomass production and weed suppression.

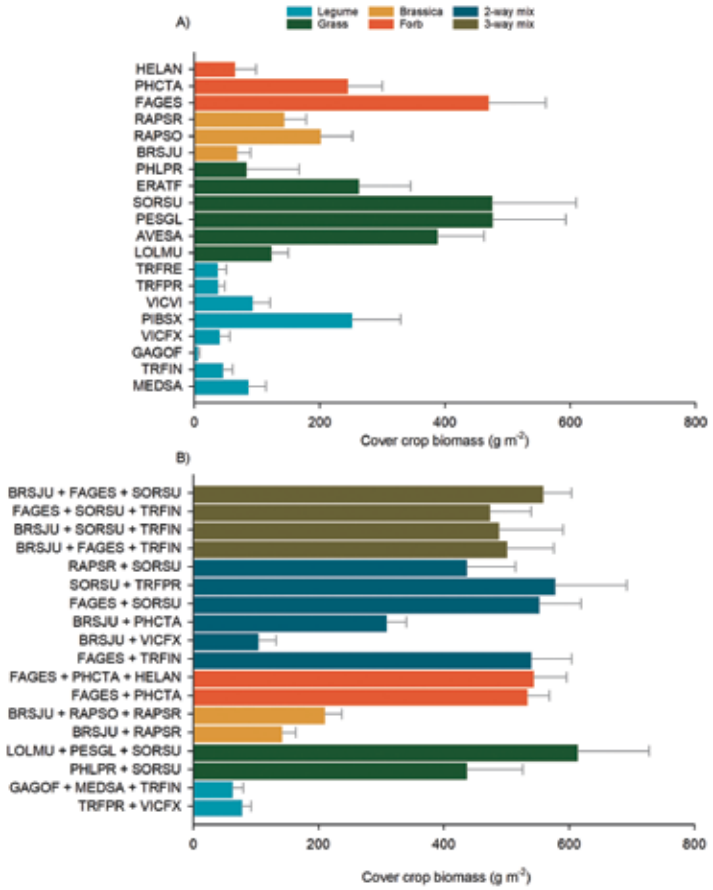


Figure 1. *Biomass production by cover crop (a) monocultures and (b) mixtures. Values are averages ± standard error.*

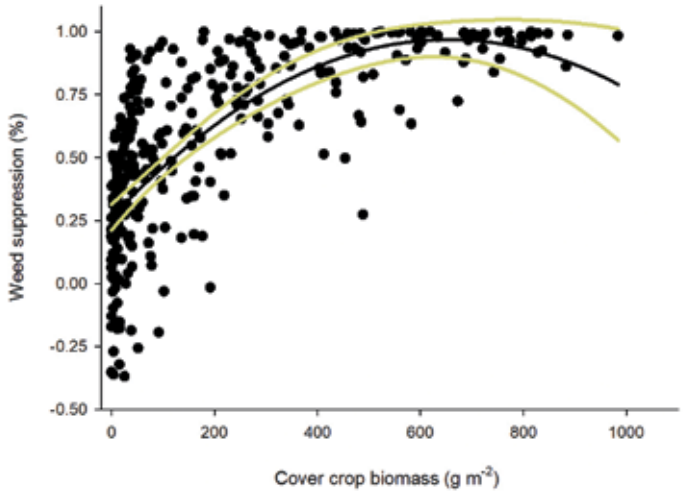


Figure 2. *The relationship between weed suppression and cover crop biomass production.*

In addition to in-season effects of cover crops, we observed several carry-over effects on the subsequent soybean crop. In the absence of herbicides, soybean biomass production and weed suppression were increased following high biomass cover crops (Figure 3a). In addition, increased cover crop biomass in the previous year was correlated to increased biomass in the subsequent spring which provided soil cover and reduced soil erosion potential over the winter

(Figure 3b). Despite improved soybean biomass and weed suppression following high biomass cover crops, we did not observe an improvement in soybean yield (data not shown).

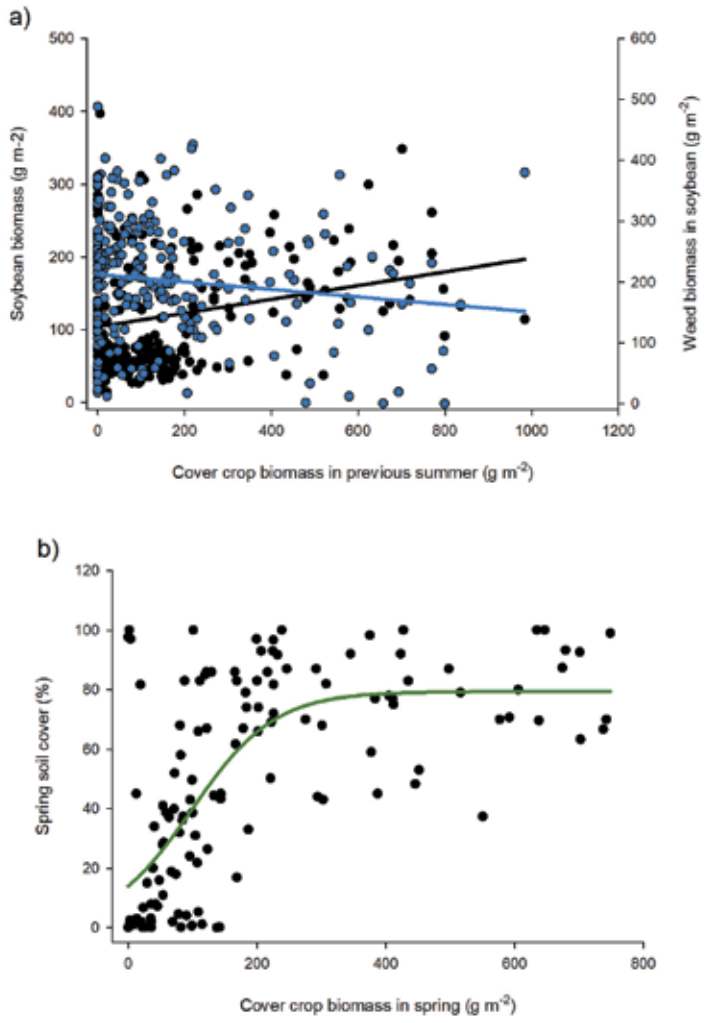


Figure 3. *Carry-over effects of cover crops to the subsequent year. The relationship between cover crop biomass productivity and (a) soybean (black) and weed (blue) biomass in the subsequent year, and (b) spring soil cover.*

Now that we have determined which cover crops and mixtures are most productive in our region the next step will be to learn more about how to integrate cover crops into current production systems. We will continue to elucidate how cover crops can provide agroecosystem services to reduce fertilizer and pesticide inputs and build resiliency in Atlantic Canadian cropping systems.

For more information and help choosing which cover crop to grow please see:

Dr. Andrew McKenzie-Gopsill, (902) 314-3683, Andrew.mckenzie-gopsill@agr.gc.ca

"Choosing annual cover crops for Atlantic Canada" AAFC Factsheet

McKenzie-Gopsill et al. (2022) The importance of species selection in cover crop mixture design. *Weed Science* 70: 436-447.

Wagg et al. (2021) Full-season cover crops and their traits that promote agroecosystem services. *Agriculture* 11: 830.

Aiyer et al. (2022) Choice of cover crop influences soil fungal and bacterial communities in Prince Edward Island, Canada. *Canadian Journal of Microbiology* 68: 465-482.

Figure 4. *Examples of cover crops, clockwise from top left: sorghum-sudangrass monoculture; buckwheat monoculture; buckwheat and phacelia mixture; phacelia and brown mustard mixture.*

MARITIME BARLEY COST GUIDE

AGC Agronomy Team

With the growing season coming up there is a lot to think about and it can sometimes be difficult to decide on what crop to grow. If you are new to growing barley or are interested in production costs below is a short guide that you can use as a starting point.

Option 1:

Varieties: AAC Ling, AAC Bell or Island

Seeding Rate: 170lbs/acre

Seeding Date: Early Spring

Nitrogen Application: 60-70lbs/acre

Herbicide: MCPA or Refine M

Fungicide: Early season (e.g., Bumper)

Option 2:

Varieties: AAC Ling, AAC Bell or Island

Seeding Rate: 170lbs/acre

Seeding Date: Early Spring

Nitrogen Application: 70-80lbs/acre

Herbicide: MCPA or Refine M

Fungicide: Early season (e.g., Bumper) then at heading (e.g., Miravis Ace)

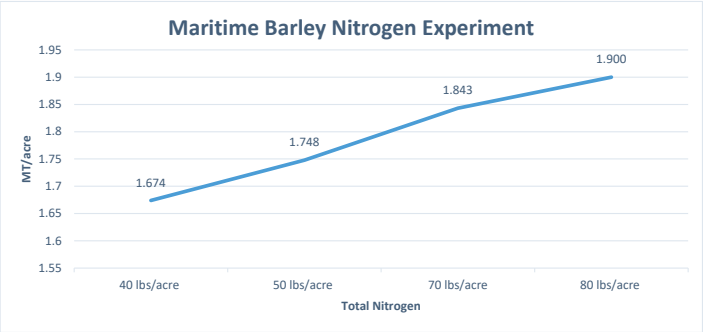
Industry Input Expenses[1]

Option 1	Recommended Value $/acre
Discing	26.70
Harrowing	15.00
Fertilizer Spreading	11.20
Nitrogen (70 Units)	90.78
Treated Seed	57.14
Planting	27.20
Spraying/Pass	12.80
Herbicide	10.01
Fungicide (Early)	10.80
Harvesting with Combine	54.30
Total Expense per Acre	**$315.94**

Option 2	Recommended Value $/acre
Discing	26.70
Harrowing	15.00
Fertilizer Spreading	11.20
Nitrogen (80 Units)	104.00
Treated Seed	57.14
Planting	27.20
Spraying/Pass*2	25.60
Herbicide	10.01
Fungicide (Early & Late)	32.80
Harvesting with Combine	54.30
Total Expense per Acre	**$363.95**

The numbers from this chart are used as a guide for treatment costs in on-farm agronomy. Other macronutrients and micronutrients are required for the success of the crop, with variation from farm to farm. It is recommended that you base your fertility requirements from your soil test results.

The data in this graph is from on-farm agronomy trials conducted over 25 sites across the Maritimes from 2015-2017. Different levels of nitrogen were applied to the crop to identify the impact on yield, quality, and changes in the soil. Most common applications were 30, 50 and 70 lbs/acre.



Industry Input Expenses[1]

Option 1	Return on Investment
Market Price/MT	340.00
Expected Yield/Acre	1.843
Total Revenue	626.62
Less Total Expenses	315.94
Total Profit/Losses	**$310.68**

Option 2	Return on Investment
Market Price/MT	340.00
Expected Yield/Acre	1.900
Total Revenue	646.00
Less Total Expenses	363.95
Total Profit/Losses	**$282.05**

If you would like to use your own numbers there is an interactive Excel spreadsheet https://atlanticgrainscouncil.ca/fact-sheets-archive/ that you can use as a guide.

[1] Please note: Cost and price information is not referenced. Atlantic Grains Council isn't responsible for any changes that may occur. This document is a guide to help you make management decisions for your business.

FORAGE EVALUATION - UPDATE

Atlantic Forage Initiative Group

The Atlantic Grains Council (AGC) partnered with the Atlantic Forage Initiative Group (AFIG) in 2021, to re-establish a forage variety evaluation program in Atlantic Canada.

The Atlantic Forage Initiative Group is an informal organization of Industry, Provincial and Federal Stakeholders representing Nova Scotia, Newfoundland and Labrador, Prince Edward Island and New Brunswick. AFIG feels that from a strategic point-of-view forage variety evaluation trials are the most valuable and impactful investment to support the success of our sectors by providing producers knowledge regarding the performance of forage varieties marketed here. The results of the variety trials will become part of the AGC knowledge and tech transfer initiative that may include field days, workshops and factsheets distributed to forage producers in all four Atlantic Provinces.

18 alfalfa and 15 grass varieties were identified for evaluation and trials were planted in the spring of 2021 at the following locations:

- Agriculture and Agri-food Canada's Research Station in Kentville, NS (project oversight by Perennia),
- Western Agriculture Centre and Research Station in Pynn's Brook, NL,
- Agriculture and Agri-Food Canada's Research Farm in Harrington, PE,
- New Brunswick Soil and Crop Improvement Association's Forage Research Site in Knightville (near Sussex), NB (project oversight by NBDAAF).

The grass trial was originally intended to look specifically at festulolium, but due to only a limited number of varieties being available, the trial was expanded to include meadow and tall fescue.

The team measured dry matter yield and forage quality for three cuts during the first production year of these trials and is in the process of compiling these results. However, since forages are perennial in nature and

often need multiple years of data to fully evaluate varieties, the suspense for information will have to build for awhile yet.

Ok, maybe a sneak peak at the festuloliums….

All festulolium varieties overwintered as well as or better than the check species in the trial; the Italian ryegrass check did not survive at the Knightville site (Fig. 1).

The festuloliums showed excellent spring vigor as compared to the check species (Fig. 1).

Unfortunately, statistically analyzed yield data was not available at the time of this publication but the ranking of dry matter yield at the individual sites, from the first production year only, is shown in Table 1. The festuloliums under test yielded very well in relation to the check species/varieties used. Only the rankings for the festuloliums and checks are shown in the table even though the ranking was done on all 15 varieties under test. Statistical analysis and data from addition production years are required to confirm this trend.

AFIG is in the planning phase to add additional forage species in the future pending successfully securing funding.

Figure 1. *Grass Plots, Knightville (near Sussex), NB in the spring of the first production year*

Many thanks to members of AFIG and the site co-ordinators for their hard work on this initiative and to the Canadian Agricultural Partnership Program for funding these efforts.

Table 1. Ranking of Dry Matter Yield at Individual Sites in the First Production Year

Species	Cross	Dry Matter Yield Rank			
		NS	NL	PE	NB
Festulolium	Meadow Fescue X Italian Ryegrass	1	3	2	1
Festulolium	Meadow Fescue X Italian Ryegrass	3	12	1	5
Festulolium	Meadow Fescue X Perennial Ryegrass	5	6	6	3
Festulolium	Tall Fescue X Italian Ryegrass	4	8	3	6
Festulolium	Tall Fescue X Perennial Ryegrass	11	10	8	10
Meadow Fescue Check	N/A	6	1	15	14
Tall Fescue Check	N/A	9	10	8	8
Italian Ryegrass Check	N/A	2	4	4	*
Perennial Ryegrass Check	N/A	13	2	10	4

* the Italian Ryegrass Check did not survive the winter at the NB site

[1] ***Festulolium*** is a genus in the grass family. The result of crosses between species of two distinct grass genera Festuca (the fescues) and Lolium (the ryegrasses). Festulolium combines the beneficial agronomic characteristics of both parents.

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