



# New Brunswick Soil & Crop Newsletter

August 2021  
Volume 8, Issue 1  
Editor: Zoshia Fraser  
& Alexandra Green

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## Carleton Region Field Day—July 26, 2021

*Author: Alexandra Green*

Attendance was impressive at this field day with farmers from Carleton County coming together to learn about the Winter Wheat and Oat trials along Route 560 in Williamstown. The event was very successful. Farmers asked questions of the presenters and gave helpful feedback on what traits they are looking for in Winter Wheat and Oats.

Ray Carmichael, NBSCIA Coordinator for the Carleton County region, hosted the event, provided supper, and introduced the speakers: David Walker, Michel McElroy and Art McElroy.

Starting at the Winter Wheat trials, David Walker summarized the work that was completed on that particular field and highlighted the strengths and weaknesses of the crop. He is strongly in favour of Winter Wheat as a crop and encouraged all farmers at the event to try it.

Following this introduction, Michel McElroy, a breeder with CÉROM who works closely with cereal farmers in Quebec, presented his notes on his Winter Wheat trial. He explained that the biggest concerns with winter wheat are getting it seeded early enough after finishing regular harvest activities and unpredictable winter survivability; however, there are many different ways solve these problems. For example, broadcast seeding winter wheat over unharvested soybeans to give them time to establish themselves, under seeding clover in winter wheat to cover the ground and build up nitrogen in the soil, and relay seeding.

Once the group moved across the road to the Oat trials, Art McElroy took over and introduced his trials. He spoke on building up resistance to lodging in varieties that will produce lots of straw and asked the producers in attendance what they would be looking for in new varieties.



All together, the field day was a great success!

*Winter Wheat Trials >*

*<Oat Trials*



## Message from the General Manager—Ray Carmichael

The past months with the COVID pandemic and Public Health guidelines ever evolving has made life as we knew it very interesting. Our annual meetings had to be virtual and there was a never-ending string of opportunities to participate in virtual webinars and Zoom meetings and I was amazed at how the skill set of members improved to manage the technology. It did however become obvious that not all rural New Brunswickers have equal access to functional internet capacity. A fact that we need to continually remind politicians and Government Department stakeholders as they push for more on-line services and applications. Although saving valuable time and expense, we still need the “face to face” opportunities. Throughout this time NBSCIA Assistant Manager, Zoshia Fraser, has done an excellent job with our web-site and social media platforms to keep all members and the public aware of your Association and current activities.

NBSCIA received Canada Summer Jobs funding for two positions and I welcome Alexandra Green and Brooklynne King to the team. Alexandra is working out of Fredericton and Brooklynne is working in the Sussex region.



A number of NBSCIA Canadian Agricultural Partnership and third party projects were renewed and are under way for the 2021 season as listed:

- NB Forage Variety Evaluation and Management Trials
- Soil Health Benchmarking Reference
- Demonstrate Biofumigant as Control of Nematode & Verticillium
- NB Crop Production Optimization
- 2020 Industrial Hemp Soil Health & Variety Trial
- Cereal, Oilseed and Forage Cultivar Development
- NB Weather Mapping for Intensive Crop Management
- NB Forage 4R Nutrient Stewardship
- Tantramar Community Pasture to Validate Improved Management
- Apple Growth and Integrated Pest Management Demonstration
- Phytogene/NB Seed Growers Oat Breeding Line Evaluation

There is still an opportunity to participate in some of these projects. Contact myself or your regional coordinator for complete details on these projects.

Last year's COVID 19 safety measures effectively concealed the Provincial Farmer of the Year award. Currently we do not have a confirmed title sponsor for 2021. Zoshia is working on re-establishing the competition combined with an appropriate award ceremony to recognize the participants and sponsor. However, this is complicated by the uncertain state of travel restrictions for guest speakers in January/February 2022 for our Annual General Meeting. Meanwhile please pass any suggestions for topics and speakers for the AGM along.

The current Public Safety guidelines enable NBSCIA to undertake outdoor field days with New Brunswick participants, the first one was held at the Forage site in Kings County, June 3, 2021 and others are planned for July and August.

## Research Summaries

In this section we have included summaries of each of the projects NBSCIA is currently working on, as well as some of the data we have gathered and produced. Each of these summaries has a full version of the report listed on our website (nbscia.ca) that you may read in full at your leisure. Happy reading!

### CI920-0201-Y2 Demonstrate Bio-fumigants as a Control of Nematode and Verticillium in Potatoes and Strawberries

The project team consists of Ray Carmichael, MSc. Ag. and Andrew Sytsma, NBSCIA Club Agrologists. The collaborating farmers are Carpenter Farms Ltd., Charles McIntosh, and Sunset U-Pick.

Root Lesion nematodes have an economic impact on potato production that could be in the range of 10% in Atlantic Canada. Root lesion nematodes and Verticillium sp. are associated with a major cause of potato yield reduction commonly referred to as Early Dying Complex (PED). Root Lesion nematodes and Verticillium sp. singularly and combined have similar negative impacts on a range of crops, including strawberries. The NBSCIA established mustard bio-fumigant cultivars in a

	Nov.26,2019			2020	June 5,2020			Oct 30,2020		
Plot	Root-lesion	Spiral	Pin	Crop	Root-lesion	Spiral	Pin	Root-lesion	Spiral	Pin
Home1-1	3680	260	0	Oat	760	0	0	0	60	0
Home1-2	1680	80	0	Oat	1220	80	0	160	0	0
Home1-3	1400	0	0	Oat	200	20	0	140	0	0
<b>Average</b>	<b>2253</b>				<b>726</b>			<b>100</b>		
Home1-4	500	0	0	Caliente	1060	60	0	60	20	0
Home1-5	1340	120	20	Caliente	240	20	100	240	120	0
Home1-6	440		120	Caliente	520	40		80	0	140
<b>Average</b>	<b>760</b>				<b>607</b>			<b>127</b>		

field in 2019 prior to potatoes in 2020 to observe its potential as a fumigant to reduce nematodes and Verticillium populations. Similar treatments were established at two locations in 2020 preceded-

ing potatoes and strawberries in 2021. The effectiveness of chemical fumigation was observed in a single location in strawberries and random samples were collected in six fields in a potato rotation to establish typical levels of infestation in commercial potato rotations. The objective of this project was to evaluate soil sampling and analytical methodologies for nematodes and Verticillium sp. to demonstrate the management of bio fumigant control in potatoes and strawberries. On average, Root lesion nematode populations increased from spring to fall in 2019 and 2020 in the potato field, and the strawberry field in 2020 under the mustard bio-fumigant. Root lesion nematode populations were significantly reduced from the fall of 2019 to the spring of 2020 at the original location. Root lesion populations were reduced under oats and mustard in the Home 1 field in 2020, however there was little observed difference between the two crop species. Chemical fumigation with Vapam in the Sunset strawberry field clearly reduced Root lesion nematode populations in 2020. V. dahliae increased from an average 6644 cells per gram to 23,721 cells per gram of soil under potatoes at the field site in the summer of 2020. Mustard bio-fumigant was observed to reduce V. dahliae population in the potato and strawberry fields during the summer of 2020. The Caliente mustard crop decreased the average number of cells per gram of soil from 9040 to 6003 over the summer of 2020. Oats as a cover crop did not reduce V. dahliae. Over the summer of 2020 the oats cover crop brought V. dahliae from an average of 7701 to 9866 cells per gram of soil.

Table 5b: 2020 Potato Field qPCR Results for <i>Verticillium dahliae</i> , and <i>Verticillium albo-atrum</i>									
		<i>V. dahliae</i>				<i>V. albo-atrum</i>			
Cro p	Client ID	DNA ng/g soil	Standard Error (ng/ g)	cells per gram soil*	Standard Error (ng/ g)	DNA ng/g soil	Standard Error (ng/ g)	cells per gram soil*	Standard Error (cells/g)
26-Nov-2019									
Oat	Home 1-1	0.32	0.03	8776	941	0.00	0.00	0	0
Oat	Home 1-2	0.93	0.18	25494	4871	0.08	0.04	2113	1118
Oat	Home 1-3	0.35	0.04	9636	1004	0.00	0.00	0	0
Mustard	Home 1-4	0.42	0.08	11624	2326	0.06	0.04	1690	1082
Mustard	Home 1-5	0.47	0.10	12937	2802	0.00	0.00	0	0
Mustard	Home 1-6	0.40	0.08	10841	2139	0.00	0.00	0	0

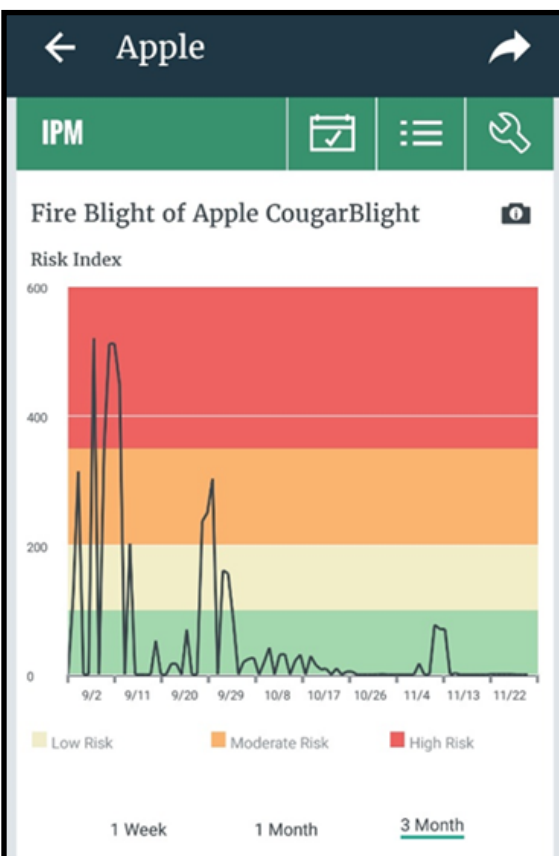
\*Table continued on next page.



5-Jun-2020									
Oat	Home 1-1	0.230	0.048	6293	1320	0.000	0.000	0	0
Oat	Home 1-2	0.242	0.062	6621	1700	0.000	0.000	0	0
Oat	Home 1-3	0.372	0.061	10190	1682	0.001	0.001	40	40
Mus-tard	Home 1-4	0.288	0.060	7890	1639	0.004	0.004	103	103
Mus-tard	Home 1-5	0.294	0.032	8067	878	0.000	0.000	0	0
Mus-tard	Home 1-6	0.408	0.094	11165	2578	0.004	0.004	111	111
28-Oct-2020									
Oat	Home1-1	0.424	0.022	11616	600	0.000	0.000	0	0
Oat	Home1-2	0.283	0.037	7746	1004	0.000	0.000	0	0
Oat	Home1-3	0.374	0.027	10237	727	0.000	0.000	0	0
Mus-tard	Home1-4	0.214	0.066	5868	1821	0.000	0.000	0	0
Mus-tard	Home1-5	0.257	0.041	7029	1113	0.000	0.000	0	0
Mus-tard	Home1-6	0.187	0.043	5112	1170	0.000	0.000	0	0

\*Table started on previous page.

stations in Bear Island and Memramcook were upgraded with a leaf wetness sensor and soil temperature and moisture probes. The weather station located at the orchard site in Kiersteadville was unable to be upgraded with the mentioned sensors this year due to late arrival of the sensors and logistical difficulties. Because of the late arrival of the new weather station and sensors, weather monitoring and insect/disease pest modelling through the Davis Mobilize app over the complete 2020 growing season was only achieved at the Memramcook site. Despite this, accurate insect pest and disease pest modelling using the integrated pest management (IPM) capabilities of Davis Mobilize was accomplished. The insect and disease pest models and alerts for risk of damage from pests provided by Davis Mobilize were relevant and accurate to New Brunswick.



## C2021-0283 Apple Growth & IPM

NBSCIA Coordinators, Central, Kings and Moncton, Amy McFadgen, Crop Development Officer, NBDAAF, Leigha Beckwith, Crop Development Officer, NBDAAF, and Garth Nickerson, Tree Fruit Specialist, NBDAAF

The implementation and use of Davis weather monitoring technology for orchard management in New Brunswick was carried out in orchards in Bear Island, Keswick Ridge and Memramcook in 2020. A new Davis Vantage Pro2 weather station, leaf wetness sensor and soil temperature and moisture probes were installed in Keswick Ridge. The existing weather



profitability of New Brunswick apple producers. However, the full 2021 growing season should be monitored with the technology before final recommendations on its effectiveness and usefulness should be made.



## C1819-0977-Y3 NB Weather Mapping for Intensive Crop Management

Ray Carmichael, MSc. Ag., NBSCIA Club Agrologist managed project activities and reporting, with support from other NBSCIA regional coordinators. The NBDAAF collaborator is David Wattie, Integrated Pest Management Specialist, Wicklow Regional Office. Bill Jones, exp, Halifax, provides contracted GIS support.

NBSCIA has completed a series of projects: EMP15-003-3: NBSCIA Agricultural Geomatics Service, C1819-0557: Climate Mapping for Intensive Crop Production, C1819-0977 NB Agricultural Weather Network and C1819-0977-Y2 NB Agricultural Weather Network for Intensive Crop Management to expand the number of Davis weather stations throughout the Province and enable export of the PAT data from the NB Potato Crop, Weather and Pest Information portal (<http://agri.gnb.ca/010-001/WebServiceData.aspx>) in a GIS compatible format. The objective of this project activity

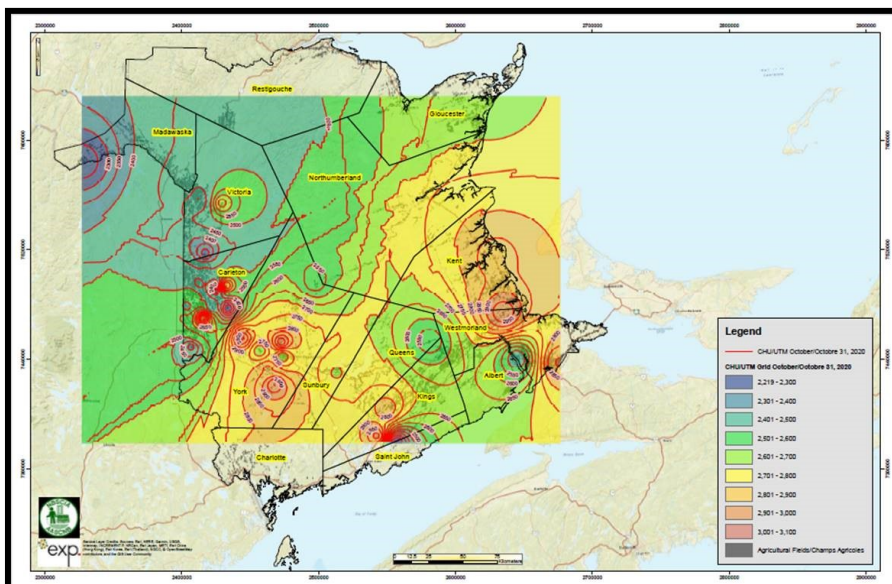


Illustration: CHU October 31, 2020

is to establish a Province wide weather monitoring network to support environmentally sustainable crop production management practices through crop and variety selection and integrated pest management programs. Eight Davis Vantage Pro weather monitoring stations with soil temperature sensor sets were installed during the 2020 crop season, bringing the total number of available network stations to 60. However, due to the COVID-19 pandemic delivery and installation of the stations was delayed until September. NBSCIA members were provided station IDs enabling them to access the Davis Weatherlink app on smart phones and read real time weather conditions at a particular station location. This was a very popular feature, particularly for determining wind speed for spraying decisions. Significant technical issues related to coding for CHU accumulations remain with the PAT data from the NB Potato Crop Weather and Pest Information portal. Significant manual intervention on the part of NBDAAF is required to ensure accuracy. A Microsoft Access routine was developed to reduce the manual intervention by NBSCIA personnel to format the combined data from all NBSCIA managed stations for export to Arc GIS for interpolation and map presentations. Month ending accumulations for CHU, GDD and rainfall for all stations were posted in a map format to the NBSCIA website: <https://www.nbscia.ca/en/nb-weather-maps-2019.html>. Alternative presentation formats were developed and tested for user preference. As a result, the map presentations will be in a raster format for 2021. This enhanced weather station network will provide New Brunswick producers another valuable tool to remain competitive in an increasingly global market demanding environmentally sustainably produced commodities.

## C2021-0033 - New Brunswick Forage 4R Nutrient Stewardship - Interim Report 2020-2021

Jason Wells, Crop Development Specialist – Livestock Feed, New Brunswick Department of Agriculture, Aquaculture and Fisheries and NBSCIA

This project hopes to engage producers to use a 4R nutrient stewardship approach to forage production and determine the cost to grow a tonne of high-quality forage on NB livestock farms. An amendment was made to the project due to the Covid-19 pandemic with the goal of examining the sulfur status of New Brunswick alfalfa stands through tissue testing. Comparisons of forage yields, quality, and cost of production (COP) using the 4R approach are ongoing for the 2021 growing season, followed by an average COP for a tonne of forage production on NB livestock farms. The project is also monitoring alfalfa stands for sulfur status, as well as checking for other nutrient deficiencies. (Continued on next page...)

Sample ID	Local	Soil B (ppm)	Tissue B (ppm)	Was there Boron in Spring 2020 fertilizer	
ATS20AB1	Central	0.3	6.99	no	
ATS20GM1	Moncton	0.4	18.89		
ATS20JS1	North Shore	0.4	20.51		
ATS20MB1	Central	0.4	11.78		
ATS20ML1	North West	0.4	13.92		
ATS20OD1	North West	0.4	26.51		
ATS20RC1	North West	0.4	22.51		
ATS20TC1	Kings	0.4	8.62		
ATS20AJ1	Kings	0.5	22.38	no	
ATS20AWL	Central	0.5	33.45	yes	0.8lbs/ac
ATS20CH1	Moncton	0.5	13.88		
ATS20DW1	Moncton	0.5	12.48		
ATS20JL1	North West	0.5	9.98		
ATS20JR1	North Shore	0.5	19.84		
ATS20KB1	North Shore	0.5	15.21	manure (2000gal/ac)	
ATS20EW1	Kings	0.6	24.29		
ATS20KG1	Carleton	0.6	32.65		
ATS20PL1	Central	0.6	33.34		
ATS20CML	Carleton	0.7	28.05	ash fall 2019	
ATS20GL1	Moncton	0.7	26.39		
ATS20LP1	North West	0.7	36.42		
ATS20CD1	North West	0.8	43.59		
ATS20JW1	Kings	0.8	23.9		
ATS20EC1	Kings	0.9	25.65		
ATS20MR1	Kings	1	22.13		
ATS20WD1	Carleton	1	27.42	yes	0.8lbs/ac
ATS20AP1	Moncton	2.3	24		
Nutrient Sufficiency Ratings (color coding)					
Sufficient					
Low					
Deficient					

The section of the project relating to implementing the 4R nutrient stewardship approach is underway with six cooperating producers. Soil samples have been taken prior to the 2021 growing season when Jason Wells and Pat Toner will make 4R fertilizer recommendations to be applied in the spring of 2021. The alfalfa fertility section of this project includes 26 participants across the province. Although the 2020 growing season was very dry, the tissue samples of alfalfa stands show that sulfur levels in the province were varied but sufficient. Surveys of producers' management of alfalfa are ongoing in the hopes of explaining the results of these tests. Magnesium and boron are low or deficient in the alfalfa tissue samples. Since these results could derive from the drought conditions of the 2020 growing season, the project team suggests that sampling should continue under different climactic conditions.

*Table: Soil and Tissue Boron Data and Survey Results Collected To Date.*

## CI819-0274-Y3 2020 CHTA Industrial Hemp Variety Trial EARI Project

*Jean-Pierre Privé, PhD. & MHI*

The primary objective of the Industrial Hemp Variety Trial project in 2020 was to assemble, establish and evaluate 13 promising industrial hemp varieties for New Brunswick and the Maritimes as part of a larger national hemp variety trial. Quantitative and qualitative characteristics monitored included plant growth and development, seed,

### *Aphids and ladybeetles*



fibre, oil, protein, and non-narcotic

cannabinoids. The results indicate that the drought in the 2020 growing season, consisting of minimal to no rain for long stretches of time and many hot nights, reduced the growth of the trials. Emergence and days to maturity also both took longer than expected. The varieties varied in emergence from 15 plants/m<sup>2</sup> to 75 plants/m<sup>2</sup>. Grain varieties have been bred for an earlier harvest than the Dual Purpose (DP) varieties, hence their earlier harvest date. Grain varieties averaged <1 m in cane height, while DP varieties averaged between 1.3 and 1.8 m in cane height. The DP varieties were bred for fibre production. Petera, Silesia and Anka, which are DP varieties, have all shown reliability in fibre production. Notable pests were goldfinches, mourning doves, starlings, and aphids. Attempts were made to control them with nets, insecticidal soap and natural occurrence of ladybeetles. Grain yields were predictably low overall, though there were differences between the varieties. Correlations between emergence and yield were not found. Results for non-narcotic cannabinoid samples are still pending. These findings, despite the drought, will be useful when added to the last 4 years of data. Producers will use this information and the recommended varieties from these trials to determine which varieties will be most useful.

### *Fibre samples*





## CI920-0035-Y2 NB Crop Production Optimization

Project Leader Ray Carmichael, NBSCIA Agrologist, Karon Cowan, owner of AgTech GIS, yield mapping and summary, Bill Jones, Geomatics Analyst, exp., provides mapping and geospatial modeling support, Zach Harmer, Practical Precision Inc. Tavistock, Ontario, SoilOptix support, Ryan Callahan, McCain Fertilizers Ltd. SoilOptix field operations, and Shawn Paget, Riverview Farms Corporation, owner/operator – potato, soybean and grain yield data.

Maximum yield is necessary for producers to be economically viable in the agricultural sector. One of the technological advancements that lets producers optimize their yield are yield monitors mounted directly on combines and harvesters. In 2015, the NBSCIA implemented ArcGIS and SMS GIS, which allows local management of New Brunswick crop

2019 Crop	Total Area	% of Field Area with Yield Improvement Potential						
			Range 1	Range 2	Range 3	Range 4	Range 5	Range 6
Grain Corn	818		33	24	15	11	7	10
Oat	138		16	9	13	17	24	22
Soybean	339		8	32	36	16	6	2
Corn Silage	215		0	5	36	40	18	1
Forage	408		21	25	22	12	5	15
All Crops:	1918	Average=	16	19	25	19	12	10
		Total Area with Improvement Potential = 80%						
		Area with Limited Improvement Potential = 20%						
2020 Crop	Total Area	% of Field Area with Yield Improvement Potential						
Grain Corn	132		24.0	29.7	24.2	16.3	5.2	0.6
Oat	319		17.3	50.5	52.0	10.8	9.9	1.1
Soybean	349		2.7	29.5	42.0	17.1	3.7	1.5
Corn Silage	143		0.3	7.0	42.5	45.4	4.4	0.3
Forage	144		16.8	16.6	16.6	16.6	16.6	16.8
Potato	155		15.4	14.7	34.5	25.6	6.7	3.1
All Crops:	1242	Average=	12.8	24.7	35.3	22.0	7.8	3.9
		Total Area with Improvement Potential = 95%						
		Area with Limited Improvement Potential = 5%						

data, as opposed to sending the data elsewhere to be analyzed. This database helps improve crop yields as well as guiding producers to more environmentally conscious cropping decisions. Therefore, this project aims to encourage adoption of crop production management technology for NB crops, improve knowledge and understanding for all stakeholders, to quantify potential for yield improvements, identify primary soil chemical and physical characteristics that contribute to in-field variability, and to document cost-benefit of variable rate application of lime and fertilizer over time. In the Kings and Moncton regions, data was collected on soil through hectare grid sampling, SoilOptix® data, and yield JD Operations data through AgTech GIS. The data was compiled into maps for analysis. Through the 4R recommendations and the

in-field variance data, it was established that in 2020, for the test sites of this study, 95% of all field area could be improved upon using these methods and technologies, compared to only 80% in 2019. This study shows that the SoilOptix® method provides a much higher resolution of soil properties than the traditional hectare sampling method. It can also analyze more aspects of the soil. Sample grids can be created by SMS operators for each field which makes coordination of soil samples more accessible. This method amasses huge amounts of data which can be further analyzed and used to make the yields more competitive. In the future, building a solid Provincial GIS database of field status will be essential. Having multiple years of field data will be beneficial for each producer.

## C2021-0034 Tantramar Community pasture to demonstrate benefits of improved pasture management

Zoshia Fraser, New Brunswick Soil and Crop Improvement Association: Project Oversight, Cedric MacLeod, Canadian Forage and Grassland Association: Project Oversight support to NBSCIA, John Duynisveld, AAFC: Contract Technical Advisor and Data Analyst, Tanya Dykens, AAFC: Knowledge and Tech Transfer support, Adam Campbell, Ducks Unlimited Canada: Head Conservation Delivery Atlantic Region, Matt Beal, Tantramar Community Pasture: Manager, Dr. David Burton, Dalhousie University, Brenda McLoon, New Brunswick Cattle Producers: Administration Management, Allison Finnamore & Trudy Kelly Forsythe, Cultivating Communications: Communications Support, Camryn Trenholm, Summer Student

The Tantramar Community pasture project aims to demonstrate the benefits of improved pasture management through rotational grazing on beef pasture land and to validate increases in soil health and carbon sequestration rates. In 2020, cross fences were installed and the pasture was able to complete the avoided conversion of grasslands protocol for carbon credit generation. (Continued on the next page...)



The results of their protocol are found in Table 1 (below). Soil health samples did show differences from 2019-2020 however more data is required before these results can be attributed to grazing pattern changes. Future soil samples will be tracked via GPS to ensure greater accuracy in results.

*Table 1: Potential for carbon credit generations through the avoided conversion of grasslands protocol at the Tantrammar grasslands cooperative Sackville, NB. Low numbers assume a 50% cropland premium, high assume full cropland value.*

Estimated Annual Credit Generation	Year 1-10	Year 11-20	Year 21-30	Average annual credit generation rate
Low	344	199	76	206
High	1,181	898	658	912

## C1819-0242-Y3 NB Field Crop Germplasm Evaluation Interim Report 2019-2020

*Peter K Scott, Crop Specialist – Cereals and Oilseeds, New Brunswick Department of Agriculture, Aquaculture and Fisheries, and NBSCIA*

The New Brunswick Crop Germplasm Evaluation project (C1819-0242-Y3) intends to identify new cultivars that will be viable for New Brunswick and be competitive in Eastern North America. This project provided agronomic data collection on five field crop species during the third year of this five-year project. A total of 962 small plot evaluations were conducted on 14 separate replicated tests that included 264 different varieties. These included two row barley (28), six row barley (12), malt barley (26), milling oats (19), oats (18), spring wheat (21), silage corn (21), grain corn (26) and soybean (77). Corn tests were conducted at two locations, Sussex and Williamstown, on both silage and grain varieties. A winter wheat test was also established in the fall of 2020. Results collected as part of this project are reported in several Maritime reports, cultivar recommendation guides or performance trial reports that are accessible either in print form or on the websites of the New Brunswick Department of Agriculture, Aquaculture and Fisheries or the Atlantic Grains Council.

## Final Report: Development proposals for sugar maple operations in New Brunswick for the purpose of carbon sequestration

Jean-Mars Jean-François, P.Ag., Ing. Forestier, M.Sc.

*Table: Carbon sequestration by tree and by site.*

This is the first report on this project. Due to the concerns for the sugar maple industry posed by clear cutting, this study aims to determine the volume of wood produced by sugar maple trees with the intention of increasing carbon sequestration. Six sugar maple producers agreed to participate in this study, and four one-acre sections were chosen on each of their farms for data collection. Soil

Site	Volume m3	Ton of wood /tree	Ton of CO2 /tree
1	4.14	2.73	7.36
2	4	2.64	7.19
3	25.38	3.56	9.54
4	5.32	3.83	10.35
5	2.89	1.82	4.92
6	2.37	1.55	4.19
<b>Average</b>	<b>7.35</b>	<b>2.69</b>	<b>7.26</b>

samples were taken to determine the pH levels in the soil. Measurements for diameter at chest height and the height of the trees (Continued on next page...)

were taken using an altimeter. Regrowth density was also observed. The data indicates that sugar maples sequester an average of 7.26 tonnes of CO<sub>2</sub> per tree. All of the sites had maple populations that were roughly the same age, and the pH levels were between 3.1 and 4.3. This project should run over the course of 4 additional years to determine the tonnes of CO<sub>2</sub> that are sequestered every year by sugar maples in New Brunswick.

## CI920-0036 Soil Health Bench Marking-Reference Project

NBSCIA Club Agrologists; Project Lead Ray Carmichael; Cedric MacLeod, MacLeod Agro-nomics; NBDAAF Project Leads (Pat Toner, Khalil Al-Mughrabi); Dr. David Burton, Uni-versity of Dalhousie, Truro

This report details the progress made on this project from April 1, 2019, to March 12, 2020. The goal of the project is to undertake an initial survey of the range of soil health values or parameters across a range of soil types and/or management practices com-mon to New Brunswick farm systems. Typical soil sample probes were used to collect the soil samples due to New Brunswick’s typically rocky soil. Another obstacle was New Brunswick’s inadequate overnight shipping system that could impact the results from the sample in biological testing.



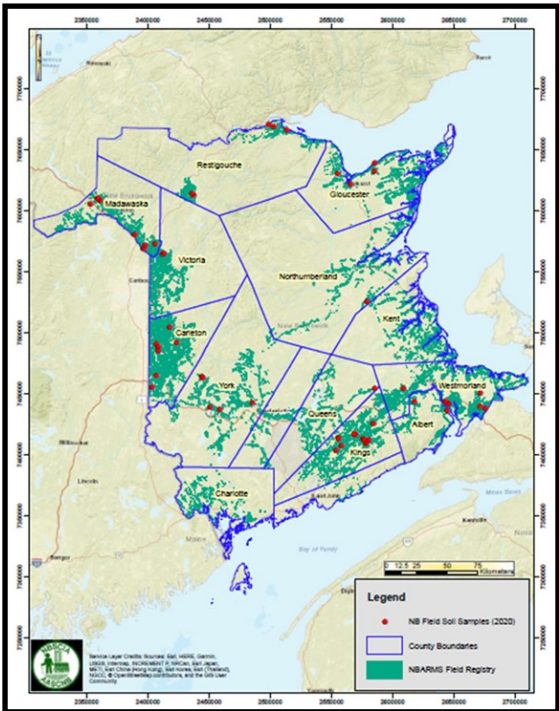
TABLE 1: Selected Soil Parameter Values for NBSCIA Regions

FIELD_ID	O. M.	pH	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Ca	Mg	B	Cu	CEC
Carleton AVG:	5.5	6.1	245	199	1160	127	0.5	4.1	13
STDEV:	1.8	0.6	143	99	575	52	0.3	2.7	3
CV	0.3	0.1	0.6	0.5	0.5	0.4	0.6	0.7	0.2
Northwest AVG:	7.0	5.9	281	126	1274	105	0.5	3.2	15
STDEV:	2.6	0.7	243	82	948	64	0.3	2.1	4
CV	0.4	0.1	0.9	0.7	0.7	0.6	0.7	0.6	0.2
Moncton AVG:	4.0	6.1	116	107	1445	167	0.4	2.5	14
STDEV:	1.0	0.5	94	59	514	115	0.2	5.3	3
CV	0.3	0.1	0.8	0.6	0.4	0.7	0.4	2.1	0.2
Central AVG:	7.6	6.0	237	92	1205	132	0.4	3.6	17
STDEV:	2.1	0.5	180	37	491	110	0.3	2.1	2
CV	0.3	0.1	0.8	0.4	0.4	0.8	0.7	0.6	0.1
Northshore AVG:	6.5	5.1	107	78	976	66	0.2	0.8	19
STDEV:	4.3	1.1	76	62	1327	53	0.2	0.8	4
CV	0.7	0.2	0.7	0.8	1.4	0.8	0.7	1.0	0.2
Kings AVG:	4.9	6.0	109	107	1198	114	0.2	1.1	12
STDEV:	1.6	0.5	56	58	469	53	0.2	0.8	3
CV	0.3	0.1	0.5	0.5	0.4	0.5	0.8	0.8	0.2

The Outbound Styrofoam cooler was used to mail up to 20 samples at a time for analysis. Soil fertility values, pH, and organic matter values are reported, finding a fairly constant coefficient of variability for all regions barring North Shore. The DalAC Atlantic Soil Health Lab had not complet-ed soil analysis as of the writing of this report. Single point soil texture classification was calculated from the percent-age of sand, clay and silt values using the USDA Natural Re-sources Conservation Service Online Soil Texture Calcula-tor. All soils were classified as a loam with varying degrees of sand or silt. Only one sample from Carleton County was identified with a percentage of clay. Going forward PEI Ana-lytical Laboratories (PEIAL) will undertake the following standard soil sample analysis: pH, OM, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, Ca, Mg, Cu, Zn, Fe, Mn, S, B, Na, Al, Lime Index, CEC, % Base Satura-tion, in addition to Soil Respiration, Aggregate Stability, Active Carbon, Biological Nitrogen Availability, and Soil Texture. NBSCIA will collaborate with Bradford Rooney, Soil Health Research Coordinator, PEI Department of

tion to Soil Respiration, Aggregate Stability, Active Carbon, Biological Nitrogen Availability, and Soil Texture. NBSCIA will collaborate with Bradford Rooney, Soil Health Research Coordinator, PEI Department of

In 2020 this project continued the initial survey of soil health values or parameters across a range of soil types and/or management practices common to New Brunswick farm systems, and is reporting for April 1, 2020 to Feb 13, 2021. 95 field samples were identified by NBSCIA members, and collected by NBSCIA Agrologists following the methodology developed in the last update of this project (Soil Health Bench Marking-Reference Project C1920-0036). All fields and sample sites were geo-referenced in the NBSCIA Geodatabase using the NBARMS field identification system. All analysis and reporting followed procedures from the PEI Analytical Laboratory (PEIAL) in 2020. Though sample numbers were limited, the data shows there are differences between cropped and non-cropped areas, with significant differences between results from these two types of area in the province and the potato rotation sites in Carleton County. *(Continued on next page...)*



Soil Health Sample Locations

In-field variability and differences within a provincial area were observed. This should be considered when making recommendations for improving soil health in these areas. To the extent possible, sample locations will be coordinated with consultants and other project operators with on-going trials throughout New Brunswick so that additional information (e.g., yield response, disease pressure) can be brought into the interpretation of the soil health results. In Appendix B, this report details results for each local region for the following soil health indicators: % SAND, % SILT, % CLAY, TEXTURE, OM, ACTIVE CARBON, RESPIRATION, Aggregate Stability, BNA, pH, P\_INDEX, C:N and % C. A summary of this information can be found in the table below. More soil samples and testing will need to be completed to create a database for comparisons of soil health in New Brunswick.

DISTRICT	FIELD_ID	% SAND	% SILT	% CLAY	TEXTURE	OM	ACTIVE CARBON	RESPIRATION	Aggregate Stability	BNA	pH	P_INDEX	C:N	% C
Carleton Avg.		29.0	51.2	19.7		5.0	538.3	0.9	49.1	38.6	5.9	11.5	10.6	2.9
StD.		6.4	5.9	7.6		2.5	231.4	0.5	28.6	32.3	0.5	6.9	2.4	1.4
Central Avg.		41.6	45.9	12.5		5.8	661.5	1.1	73.4	53.8	5.9	6.6	10.5	3.4
StD.		17.2	14.1	3.8		2.7	231.8	0.5	15.6	27.0	0.4	5.1	1.9	1.6
Kings Avg.		48.5	39.7	11.8		5.0	658.3	0.9	50.4	45.3	6.1	9.0	10.4	2.9
StD.		13.0	10.3	3.6		1.5	184.2	0.3	22.9	20.0	0.5	6.4	1.6	0.9
Moncton Avg.		45.3	40.6	14.0		5.6	654.6	1.3	60.2	55.6	5.6	8.0	12.0	3.3
StD.		4.4	5.3	2.6		1.9	189.1	0.8	19.0	25.9	0.8	4.7	1.7	1.1
Chignecto Avg		38.7	43.8	17.4		7.0	719.2	1.2	63.3	60.2	6.0	6.9	10.7	4.0
StD.		19.4	12.5	9.6		5.2	292.4	0.4	24.1	32.0	1.0	5.0	1.1	3.0
Northshore Avg.		31.9	48.7	19.5		7.1	902.4	1.3	67.6	50.8	6.7	12.4	10.8	4.1
StD.		12.6	10.0	4.4		1.9	187.0	0.3	15.2	19.6	0.3	14.3	0.8	1.1
Northwest Avg.		33.7	51.4	14.9		7.3	813.3	1.0	77.0	45.9	6.1	11.2	10.3	4.2
StD.		11.4	8.7	4.5		2.9	249.8	0.5	21.0	21.8	0.7	7.1	0.8	1.7
2020	Average of 95:	37.5	46.8	15.7		5.9	680.4	1.0	61.7	47.7	6.0	9.6	10.6	3.4
2019	Average of 93:	46.2	40.0	13.8		5.7	555.0	na	61.5	na	5.9	na	na	na

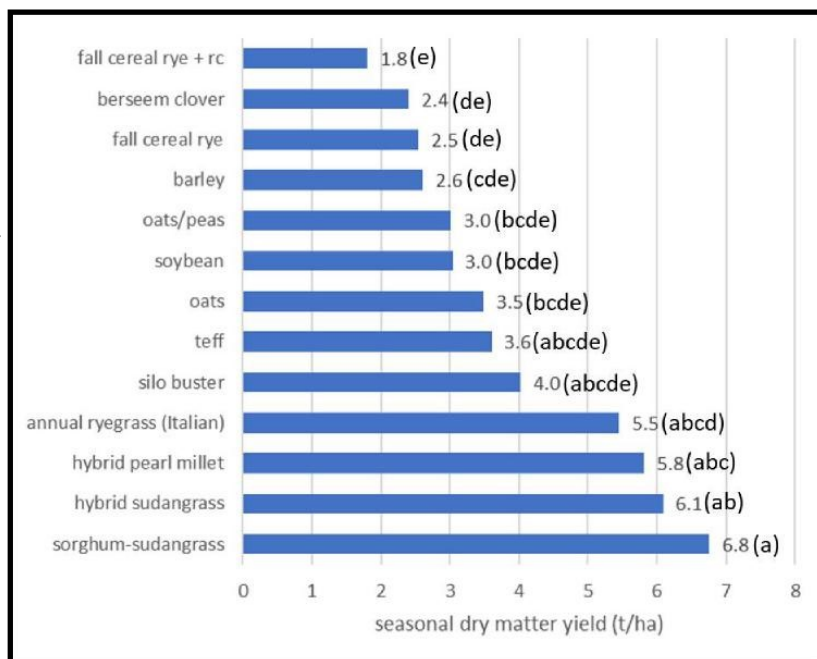
\*The full table is available on [nbscia.ca](http://nbscia.ca) in the full report.

## CI8I9-0246-Y3 NB Forage Variety Evaluation and Management Trials

The project team includes Ray Carmichael, NBSCIA General Manager, Zoshia Fraser, NBSCIA Assistant General Manager, NBSCIA Research Technician; Summer Research Assistant, Agro-Environmental club Agrologists; Pat Toner, Jason Wells and David Dykstra (NBDAAF).

This report is for the third year in this project and summarizes findings from April 1, 2020 to Feb 12, 2021. This report aims to identify nutrient uptake and removal requirements of legume and grass forage stands at the higher forage yields being obtained and at medium fertility and pH levels, evaluate the effect of species interaction of Red Clover and Alfalfa (the legumes) with grass species with the potential for higher quality and yield in both complex and simple forage mixtures over the life of a sward, evaluate the role of annual forage species and cereals (oats, barley, peas, etc.) as a companion or nurse crop, and evaluate numerous plant species for suitability as emergency forage crops on New Brunswick livestock farms.

(Continued on the next page...)







An alfalfa stand was planted in Knightville, NB in the spring of 2020 to test new fertilizer recommendations for higher potassium. Due to COVID-19 the Grasses/Legume mixture evaluation was abandoned. For the nurse/companion forage crop evaluation, alfalfa was seeded alone and in combination with various nurse crop options. Results show that more alfalfa plants grew when there was no nurse crop. The emergency/annual forage crop evaluation looked at options for producers to utilize in the face of global warming and changing weather patterns. Sorghum-sudangrass had the highest T/ha in 1st Cut and Seasonal Dry Matter Yields. All crops were negatively affected by the dry climactic conditions.

## Regional Updates from your NBSCIA Coordinators

### North West Press—Jean-Mars Jean-François

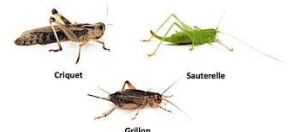
The 2021 season is relatively earlier than that of the previous one. Grains and potatoes were sown about two weeks earlier. However, farmers had to deal with very capricious weather (drought alternated with very rainy episodes). Potato growers have experienced delays in applying pesticides to control fungal diseases due to the last rains. The yield obtained with the first crop of hay must be qualified as average because the rain expected in May has not been there. At the same time, we visited a 31-acre field of hay completely ravaged by grasshoppers. The picture exposed the reality on the same farm just before the first cut. The incidents are so serious that the farmer has decided to abandon this field. He is worried that the insects will spread to nearby fields. In 2021, the northwest Club will set up a project aimed at providing an adequate response to this problem.

Concretely, the north-west Club was very active last year and is still involved in 5 projects. The first one assists the maple producers (members) to evaluate the carbon sequestration on maple syrup lands in the north-west area of New Brunswick. In this project, five sites were taken respectively: 2 in green River, 1 in Saint-Quentin, 1 in Val Lambert, 1 in Val d'Or and 1 in Lac Unique. For the first year, measurements (diameter and height of trees) were taken on 4 plots by site. At the end, we calculate the volume of organic matter produced by tree and by acre. This information will help to determine the quantity of carbon sequestered yearly. This project will allow maple producers to sell carbon on the carbon market. This summer, due to lack of funds, we don't know yet how to pursue the collection of data. The second project focuses on fertilization of Christmas trees with wood-ash at Saint-Quentin. Over 5-6 years, we collected data on height and quality of the trees during the autumn. The third project promoted the BMPs as run-off control, fence installation, and digging a small lake to water the livestock, and gutter installation on farms. The fourth project focuses on Alfalfa tissue samples collected to determine the level of fertilization of the field and to compare around the Province. The last one is about the soil samples on different farms in the north-west area to analyze the potentiality of the soils in macro and micro nutrients.

Regarding the direct services offered to the farmers, the Club continues to accompany the farms to apply for funds in the Canadian Agricultural Partnership. Also, we provide services on environmental farm plans and fertilization plans. Some farmers benefitted from our services based on some agricultural research too. Otherwise, last year, soil samples were analyzed on about 4250 acres of farm land and 5300 acres of maple tree land. Furthermore, water samples were collected for dairy farms. The North-west club expresses its gratitude to NBDAAF for its financial support, to the NBSCIA for its technical and administrative supports in carrying out its mission and the members for their collaboration. Agriculture is our vocation; the environment, our resolution.



### Clean Field



## North Shore Headlines—Nadler Simon

The North Shore NBSCIA is again fully engaged with its members at this new agricultural season. In accordance with its mission, the North Shore area is continuing to assist local forage and small fruits producers towards a profitable and sustainable agriculture. This is a dynamic group, this year 41 members are registered; 24 small fruits and 17 forage producers, thus representing a membership increase of 13.88% with respect to last year. Until now, fields have been toured for scouting and appropriate recommendations have been formulated to farmers accordingly. In wild blueberry fields, weeds, insects and diseases have been controlled, fertilizers applied, pollinators introduced and weather stations installed. In forage fields, sizes have been determined, soil samplings performed and several research and development projects are ongoing (forage 4R nutrient stewardship, alfalfa tissue survey, soil health benchmarking-reference). Soil compaction still remains a big challenge in some forage fields, notably when sampling soil. Moreover, steps have been taken to get EFP and NMP updated for forage producers to meet the dairy production requirements. Although this agricultural season is shaping up to be warm, we should not record similar weather variations nor drought periods like last year. Frost damage risk is over in wild blueberry fields, and in order to boost the production with respect to the stress caused by drought of last year, 75 to 100 pounds of granular fertilizer 26-0-0 was recommended to be applied on several crop year fields. Results are now becoming visible. The forage yield from the first cut in early and mid-June appeared to be quite good. As part of field trials, some random samples of forage are frozen, waiting to be analyzed at a designated laboratory for nutritional quality. Along with that, growers still need to tailor their practices taking into account the Covid-19 regulations. This season, the North Shore will continue to ensure its role in better serving agricultural producers (members) in this area.

### *Main crops production in the north shore area in early June*



*Introduction of pollinators in crop year wild blueberry field at flowering stage.*



*One hundred percent of Alfalfa stand at bud stage before the first cut.*

## Central Review—Andrew Sytsma

The 2021 season of fieldwork kicked off earlier than usual with the fast snow-melt and tractors being seen in the field in the first few weeks of April. The early start to fieldwork meant that a lot of soil sampling was done this spring. All of the Central-region weather stations were reporting temperature and rainfall at the start of the weather mapping season in the beginning of May so we'll have more accurate data and weather maps than last year where we were having some technical issues with some of the stations. Due to issues with the data from the new weather stations installed last year and this year across the province, the corn heat unit, growing degree day and rainfall totals aren't available yet. We're working with the data now and getting close to being able to report the data totals, so stay tuned! *(Continued on the next page...)*





Plenty of research work has been done so far in the Central region, with the Alfalfa Tissue Survey and Apple Integrated Pest Management projects going again for their second year and the Forage 4R project starting this year. The Central club has gained several new members this year. 2021 so far is shaping up to be a much better growing season than last year. Forage yields are way up, grain crops are well on their way and the new growth on apple trees is already more than all of last year's new growth. Here's to a good rest of the summer!

## Kings County Happenings—Joseph Graham

Kings County has been keeping busy with the usual soil sampling and project work. Working with continually changing Covid-19 guidelines has been difficult. However, this spring has gone much more smoothly compared with the beginning of the Covid-19 pandemic in New Brunswick. We hope everyone is well and has successfully weathered this storm. Here's hoping we can finish this year with reduced uncertainty and restrictions.

One major project, the forage trial site, has been extended. The size of the site and number of trials has increased and we hope to show these off with another forage plot tour. Last year Kings County had a very positive plot tour. This year it should be even more interesting with a solid list of trials on display: alfalfa variety, pearl millet, alfalfa nurse crop, alfalfa fertility, fall rye/winter triticale and emergency forage crop trial.



Kings County, with the help of Jason Wells, hosted a small Alfalfa nurse crop plot tour in the evening on June 3<sup>rd</sup>. We hoped to show some of the trial work before the first harvest was taken and sent for results. Overall, Kings County first cut started earlier, but yields look promising. Hopefully rainfall totals for the summer are adequate for a good growing season. Keep an eye on your emails as usually these tours get planned quickly just before we harvest.

The weather stations across Kings County are all reporting. The Knightville station is up and running at the forage trial site. We hope to keep long term location data that we can match with trial results.

This weather station project provides great localized data for our members and NB as a whole. Two new stations were installed in Lameque and Val-Doucet. For anyone that is curious about weather across the province the weather mapping is posted on the NBSCIA website.

### **Other happenings in Kings County**

Despite Covid-19 Kings is still doing our best to plan and host events. This fall we are planning a forage day, August 30th, hosted by Giermindl's. With Covid-19 the process and setup may change. In general, the forage days take place in late summer. It is a great opportunity to see what local dealers have and ask questions about forage and equipment.

We are also working on details for Farm of the Year banquet and the local Farm of the Year dinner. Last year we were unable to host these events. This year's Kings Candidates are Bruce and Nancy Colpitts of McCrea farms. *(Continued on next page...)*





McCrea's have an extremely diverse farm in Shannon, NB. The local soil and crop membership will look forward to once again hosting a Farm of the year dinner to acknowledge the work being done at McCrea's. More details to come later this summer.

Lastly, I would like to acknowledge the Kings County soil and crop board and membership. This year KCSCIA supported another student who will be continuing their education in agriculture or environmental studies. We believe that in the future they will help advance agriculture and environmental science here in NB. This year we have proof that it works. Kings County presented such an award to Brooklynne King 2 years prior. This spring Brooklynne was able to work and learn more about agriculture through a work placement here at NBSCIA. We thank her for all her hard work. More importantly we are excited to contribute to students learning more about agriculture and its producers. A big congratulations goes to all the 2021 Grads in Kings County.

### Carleton County Roundup—Ray Carmichael

Spring opened early this year with record setting temperatures, combined with a gentle winter. This got perennial crops off to a good start with some very early planting and first cut forage. This preceded a period of "colder" wet weather but overall crops looked good by the end of June.

Environmental Farm Plans, equipment calibrations and fertilizer recommendations for members continued. Dairy farmers are working to meet the environmental requirements of the ProAction program. Potato producers are increasingly interested in crop rotations because of McCain's promotion of regenerative agriculture and the Farm of the Future concept.

Spread pattern tests and calibrations were completed for two members this spring.

The Cerom winter wheat trial was fertilized on April 20 and May 24. The Phytogene oat trial was planted May 10 and broadleaf herbicide applied June 6. These trials looked great as of June 30.

Several 2020 CAP projects of interest to local members were continued this year: NB Weather Mapping for Intensive Crop Management, NB Crop Production Optimization, Soil Health Bench Marking-Reference, Demonstrate Bio fumigant as a Control of Nematode and Virus in Potatoes and Strawberries.

2021 CHU, GDD and Rainfall accumulations to May 31 were posted to the NBSCIA webpage. Nematode and Verticillium soil samples were collected for the Biofumigant trial May 17, and Canadian Forage Pearl Millet (CFPM) and Caliente mustard planted June 3-4.

A considerable amount of time was dedicated to preparation of the Ag Alliance grant application to the Agriculture Climate Solutions program. Going forward there will be an opportunity to participate in a Living Labs project starting in 2022. In late June, Agriculture and AgriFood Canada announced an Agriculture Clean Technology Program and a number of members have expressed interest in making an application.

### Moncton/Chignecto News—Zoshia Fraser

It's been quite a while since our last edition of the Newsletter and we've managed to stay busy in Moncton-Chignecto! Both clubs held their Annual general meetings virtually for the first time. Moncton's AGM was held February 3<sup>rd</sup> with Chignecto following on February 5<sup>th</sup>. Both meetings featured a presentation from Karen Haugen-Kozyra titled "Where we've been and Where we could go— how the Beef/Forage Sector can play a role in meeting sustainability goals." *(Continued on the next page...)*



The take home message from this presentation was that, despite beef's bad reputation, the cattle industry has a key role to play in climate change adaptation and mitigation. Particularly, when we look at the carbon sequestration potential of grassland ecosystems. Both events were relatively well attended and I want to thank all my members for learning with me as we navigated a full year of virtual meetings and presentations!

After the season of drought that was 2020, I'm very happy to report we have had rain in 2021! It has turned into a bumper year for many crops including strawberries and forages. After an easy winter, legumes across the region are looking and performing the best they have in

the three years I've been in the province. With many producers wondering where they will store this year's crop it's a relief to hear the good news! In 2021 the Moncton-Chignecto region will be participating in six research projects, ranging

in topics from apple pest modeling to soil health evaluations and forage fertilizer trials. These projects are continuations of the work we started in the region in 2020 and the highlights of last year's results can be found in the research section of this newsletter. If you're not currently collaborating on a research project with NBSCIA and you'd like to find out more about how to get involved, please give your local coordinator a call.

Looking forward to the rest of the summer, I will continue to deliver the research projects throughout the region and complete member services. I want to take a minute to remind our Dairy producers that starting this fall as part of the environmental model of ProAction you are going to be required to have a valid EFP and recent soil samples. Myself along with the rest of the team at NBSCIA are here to help you prepare for this new model and if you're going to need sampling this fall I encourage you to reach out now so we can start making plans! I'm also eagerly looking for topics for field days for both clubs, so if you've got any ideas on something you would like to see or hear about please reach out and I'll do my best to make it happen!

As always, if there's anything I can do to help you and your farm please reach out,

Zoshia





## Summer Student Introductions

### Alexandra Green—Central/Carleton



Hello everyone! I started working for the NBSCIA on June 21<sup>st</sup> and it has been an adventure up until now. My job as a summer student has me reading reports and creating workbooks as well as collecting samples and working to maintain various plots. I have just finished my Education Degree and I will be teaching a Grade 5 Intensive French class in the fall, and I am really looking forward to that opportunity. This summer, working for NBSCIA is giving me lots of general experience with agriculture, and I am hoping to learn as much as I can about why I am doing the work that I am doing so that I can pass that knowledge and pride on to my students. I have asked many questions of the people I am working with, and I will keep on asking questions. (Hopefully my coworkers don't mind). Who knows? Maybe one of my students will be a future employee of NBSCIA! Happy learning!

### Brooklynne King—Kings County

Hi everyone, my name is Brooklynne King, I am the summer student for the Kings County area. I graduated from Belleisle Regional High School in 2019 and received one of the NBSCIA bursaries which I am very thankful for. I grew up in Midland surrounded by many farms, with most of the traffic on my road being tractors. I have always loved the environment which is why I decided to pursue an education in the environmental field.

I am a recent graduate from the Environmental Technology program at NBCC. My favourite courses during this program were Geology, Soils, Water Quality and Waste Management. For my work practicum with NBCC I knew I wanted to work somewhere where I could learn more about agriculture and get some hands-on experience in the field. NBSCIA was happy to take me on for my work practicum which then led to this job opportunity as their summer student for 12 weeks. Some of the things I've been up to since working here are taking alfalfa tissue samples, taking soil samples, creating maps, identifying different apple pests and working at the forage plots in Knightville. I have learned so much with NBSCIA and my appreciation for agriculture has grown significantly. I am excited to continue learning and I hope to meet many of you over the summer.





# Say Cheese!!



## Member Service Description

### Geomatic packages

- Includes a basic set of farm maps. These maps are georeferenced and illustrate watercourses and other buffers
- Custom mapping packages include Soil Status maps, Target Balance Maps, Variable Rate Application Maps

### GPS work

- Perimeter mapping, area determination, crop yields

### Soil Sampling package

- Includes sampling, sample preparation, completion of soil form and submission of samples, and interpretation of results as well as recommendations (does not include cost of soil analysis)

### Environmental Farm Plan

- Can create field and farm maps, emergency response plans, as part of your environmental farm plan

### Equipment calibration

- Calibrations on sprayers, seeders and manure spreaders

### Emergency Response Plan

- A written emergency response plan for compliance with regulatory bodies

### Nutrient Management Plan

- Whole farm nutrient management plans, including plans compliant with the Livestock Operations Act

### Intensive Crop Management Planning

- Integrated Pest Management
- Scouting fields for insect pests and weeds
- Plant population counts and plant emergence counts

### Canada GAP Pre-Audit Assessment

### Cost of Production Analysis

### Crop Monitoring

### Production Management

## Contact Us

If you are in need of any services, or have any questions, please contact your local Coordinator.

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