MCDC
2021

MHPEC Inc. acts as the industry partner in managing the Manitoba Crop Diversification Centre (MCDC).

MCDC's programs are broadly classified as sustainable irrigation practices, applied potato research, climate-resistant agriculture, and crop diversification. This partnership between MHPEC and Manitoba Agriculture provides a unique opportunity for a collaborative site which amplifies the scale and significance of research that can be done.

Keystone Potato Producers Association, McCain Foods Canada, and Simplot Canada II constitute the members of the Manitoba Horticulture Productivity Enhancement Centre (MHPEC Inc.)

OUR GOAL

to provide leadership and vision through cooperation, coordination and strategic collaborations between industry members and the scientific community, resulting in the development of a research program that will ensure the long term sustainability of the potato industry in Manitoba.

FROM THE MANAGER

Thank you for taking the time to read and review our 2021 report and looking forward to the 2022 year.

The Manitoba Crop Diversification Centre (MCDC) was established between the Government of Canada, the Government of Manitoba, and Manitoba Horticulture Productivity Enhancement Centre Inc. (MHPEC). We are located at the north-east corner of the junction of highway number 1 and number 5 at Carberry Manitoba.

The Centre's mission, in brief, is to facilitate the development and adoption of science-based solutions for agricultural crop production. This is accomplished through the design, development, and adaptation of best management practices with a focus on water management, crop diversification and environmental stewardship. Its strategic areas include sustainable irrigation, sustainable potato production, improving the environmental sustainability of intensive crop production, and crop diversification.

Here at the MHPEC site we are fortunate to have the support of our three industry members Keystone Potato Producers Association, Simplot Canada II Ltd., and McCain Foods Canada that allows us to operate and conduct research for the potato industry, as well as other trials on crops. The results of this collected data are then entered and published for distribution to all interested stakeholders in potato production. These reports and the full report are also available online at www.mbpotatoresearch.ca.

Since March 2020, due to Covid-19 restrictions, our offices have been closed to the public and access can be granted by appointment only In response to the rapid spread of Omicron variant and rising COVID case counts, the Manitoba Potato Production Days 2022 had to be cancelled. We hope to host multiple outdoor extension and knowledge transfer activities such as field days and plot tours in 2022.

In closing I would like to thank you for taking the time to read and review this publication. We welcome, any and all, researchers, commodity groups and interested industry parties to bring forward your research projects for discussion. We are always open to the possibility of new research and trials at our site.

Call us at 204-834-2007
Email me at mhpec_manager@outlook.com

Garth Christison

Manager for MHPEC Inc, MCDC Carberry

Conducting Research at MCDC Carberry

BENEFITS OF CONDUCTING RESEARCH AT MCDC CARBERRY

- Soil types that match light and heavy soils used in Manitoba crop production
- Irrigated and dry land available
- Ability for the site to provide other services – tillage, sprays, specialized crop research and precision agricultural equipment
- Low overhead costs
- Soil optix available for nutrient mapping
- Drone imaging available for canopy reflectance measurements
- Decades of historical data, maps, soil horizons, and surveys onsite
- Access to dedicated research staff onsite with experience conducting trials with potatoes, grains, brassica crops, legumes, forages, and specialty crops
- Proximity to Environment Canada and Agriculture and Agri-Food Canada weather stations
- Easy access at the junction of highways #5 and Trans-Canada highway #1
- Proximity to Carberry growers and central placement in Manitoba's processing potato region
- Trained and certified staff members in First Aid and WHIMS

On-site events and extension

- Annual field day
- Extension workshops
- Presence at major provincial extension events including Manitoba Potato Production Days, Manitoba Ag Days, Manitoba Agronomists Conference, Crop Connect Conference etc.
- Demonstrations
- Boardroom, classroom, laboratory space available for producer meetings, education and knowledge transfer events

Potato Program

Zack Frederick, PhD, P. Ag

Applied Research Agronomist

MHPEC Inc.

MCDC Carberry

Cell: 204-841-3632

Zack received his Master of Science in Plant Pathology with a minor in fungal and Oomycete biology from Cornell University in 2013

Zack received his Doctor of Philosophy in Plant Pathology with a minor in fungal and Oomycete biology from Washington State University in 2017. Zack's advisers included Drs. Dennis Johnson, Mark Pavek, Debra Inglis, and Weidong Chen, and his research and extension program focused on disease management strategies for soilborne fungal diseases of potato in Washington State's Columbia Basin with a focus on Verticillium wilt. Zack was awarded the J. de Weerd Fellowship in Potato Research in both 2015 and 2016. Zack was also an ARCS scholar (Achievement Rewards for College Scientists) from 2013 to 2017.

Zack has been the principal investigator of a research and extension program from 2017 to the present day for the Manitoba Horticulture Productivity Enhancement Centre (MHPEC) Inc. Zack's efforts to study Manitoba's potato yield variability have highlighted the importance of Verticillium wilt identification and management, as well as nutrition optimization for regional nitrogen and sulfur programs. Additional research is currently underway to study black dot and powdery scab identification and management, the development of disease-suppressive soils, irrigation decision support tools, seed cutter disinfection, and the implementation of precision agriculture tools into research with UAVs and a remote sensing device called Soil Optix.

Crop Diversification Program

Haider Abbas, M.Sc. P.Ag.
Applied Research Specialist
Manitoba Crop Diversification Centre
Manitoba Agriculture
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Carberry MB R0K 0H0

Cell: 204-247-0768

I was born & brought up on a family farm. I have approximately 12 years of professional experience related to agricultural research and demonstration. I received a M.Sc. in Agricultural & Biosystems Engineering from the University of Manitoba (Soil and Water Engineering focus), and a B.Sc. in Agricultural Engineering (Irrigation & Drainage Engineering focus).

I currently work as the Applied Research Specialist with Manitoba Agriculture, in Carberry at the Manitoba Crop Diversification Centre, where I am supporting MHPEC in executing a small plot research program with expertise in crop agronomy, soil and water engineering, experimental field plot design, and management of field research activities. Moreover, I have sound working experience of precision agriculture technologies such as GPS, Real Time Kinematic (RTK) guidance systems, operation and maintenance of farm scale equipment, and grain cleaning equipment. I am certified in WHMIS and Emergency First Aid/ CPR/ AED Level A from the Canadian Red Cross.

MCDC's goals are to increase profitability, sustainability, and adaptability of local farms; accelerate the adoption and commercialization of research innovation at the farm level; facilitate the adoption of technical innovation or practices from outside of the province or country; and improve the overall growth of the agriculture, agri-food and agri-product sectors. Transfer of knowledge is a priority and project results, technical information and emerging opportunities are accessible through annual reports, field days, tours, extension videos, and display booths at agriculture trade fairs. Financial support is provided through the Canadian Agricultural Partnership (CAP) program, a federal-provincial-territorial government initiative, as well as through the Provincial Agricultural Sustainability Initiative (ASI) grant.

Improvements to Potato Yield Through Sulphur Fertility 2021

Principal investigator: Zack Frederick
Technician: Andrea Hamilton, Faryal Yousaf, Bev Mitchell, Alan Manns, Alex Christison
Summer students: Whitley McDonald, Olivia Gessner, Nicole Buurma

Previous research and results:

- Field Variability Study (FVS): 40-60 lbs of sulphur appeared to be the most beneficial amount of available soil sulphur, and compromised yields were observed outside of this range. Sulphur-associated decreases in total yield and 10-12 oz tubers often occurred in lighter-textured fields and/or areas of fields that had 0-5 lbs of sulphur at row closure.
- MCDC Plot-scale Sulphur Study 2019-2021: All preplant sulphur fertilizers (magnesium sulfate, ammonium sulfate, Tiger Combo) met or exceeded their target amount of soil sulphur at row closure with the exception of Tiger XP. The use of any of the four sulphur fertilizers (independent of rate) tested improved soil sulphur availability at row closure, total yield, and the dollar value of that yield. 2019-2021 results indicate all sulphur fertilizers employed increased 10-12 oz tuber yield and dollar value (by accruing bonuses) when compared to negative controls. Within each fertilizer product, rates targeting 60 lbs/acre exceeded FVS goals and trended towards more 10-12 oz tubers and dollar value.

Objectives:

1- Demonstrate field scale sulphur remediation by restoring deficient soil to 60 lbs of soil sulphur will impact total yield, 10-12 oz tuber yield, and dollar value.
2- Demonstrate field scale sulphur remediation is cost-effective (benefit to yield offsets cost of fertilizer, labor, fuel).

Future goals:

- Move the most promising results for the most cost-effective sulphur programs from the plots to the field scale and verify small plot trends carry over to the large scale.
- Looking for 3-4 growers with lighter soil textures who would be willing to use Tiger-Sul or ammonium sulfate products on an entire 130-acre field or any partial subset.
- Provide community extension to demonstrate benefit and improve industry practice.

Mustard Biofumigation Study 2021

Principal investigator: Zack Frederick and Haider Abbas
Technician: Andrea Hamilton, Faryal Yousaf, Bev Mitchell, Alan Manns, Alex Christison
Summer students: Nicole Buurma, Olivia Gessner, Whitley McDonald

Previous research and results:

- Agronomics for maximum biomass worked on 2018-2021, 2020 saw first successful year with sufficient biomass for theoretical Verticillium biofumigation.
- Initial MCDC work with Caliente Rojo in 2018.
- Initial fieldwork with Caliente Rojo 2019-2021.
- Initial MCDC work with AAC Brown in 2021.
- qPCR *V. dahilae* quantification protocol developed with PSI labs in Winnipeg. Protocol based on Wei et al. (2015) http://dx.doi.org/10.1094/PHYTO-05-14-0139-R using their primer set based on a highly specific region of intergenic spacer (IGS) of ribosomal DNA.

Objectives:

1- Reduction of *V. dahliae* disease + propagules in field.
2- Determine if treatment is cost-effective.
3- Characterize agronomic practices for mustard cultivars 'Andandte', 'Caliente Rojo', 'Cutlass', and 'AC Volcan' necessary to achieve maximum biomass to theoretically maximize glucosinolate production.

Objectives:

a) Practices to target: planting date (Mid July, Late July, Aug 1, Mid Aug), flea beetle control, minimum inputs (irrigation, N+S fertilization) needed to achieve max biomass, seedbed preparation (stubble type, chaff spreading, best seed-to-soil contact ratio).
b) Deliverables:
   i. Develop list of recommended and experimentally verified practices to successfully use mustard biofumigants as part of program to manage Verticillium wilt in Manitoba.
   ii. Improve recommendations for the inevitable question of "does this process work with other mustards?".
   iii. Develop experimental evidence to make the call for Canada-bred mustards for biofumigation (if existing mustards will not suffice).

Future goals:

- Continue field work with Caliente Rojo to simultaneously encourage industry uptake of the concept of mustard biofumigation and develop a robust dataset to verify *V. dahliae* reduction in soil counts of disease symptoms after treatment.
- Facilitate adoption of new mustards for biofumigation for growing situations that are not suitable for Caliente Rojo.

Potato Nitrogen Study 2019-2021

Principal investigator: Zack Frederick and Haider Abbas
Technician: Andrea Hamilton, Faryal Yousaf, Bev Mitchell, Alan Manns, Alex Christison
Summer students: Nicole Buurma, Olivia Gessner, Whitley McDonald

Previous research and results:

- Field variability study identified that row closure soil nitrogen had significant association with decreased 6-12 oz tuber yield. Possible target was 120-180 lbs soil N by row closure.
- MCDC Plot-scale Nitrogen Study 2018-2020: ESN and Urea at varying rates at plant and/or top dressing at hilling generally did not provide target row closure N (120-180 lbs N). Even if one plot in one year achieved target rate, other replicated plots could not do so. All nitrogen treatments provided superior yield and quality improvements when compared to a negative control (no added nitrogen), however the impact of any nitrogen treatment compared to another on yield was nonsignificant.
- Piezometers were installed to monitor EC of leachate moving deeper into the soil, and the devices indicated the majority of applied nitrogen, regardless of form, was leaching below the potato root zone.

Objectives:

1- Link 120-180 lbs N in soil at row closure with increased 6-10, 10-12 oz tubers.
2- Determine if N treatments are cost-effective.
3- Decrease N leaching + Salinity (measured by EC).
4- Quantify decreased N loss as part of cost-effectiveness of treatment.

Future goals:

- Begin plot experiments in 2021 with preplant nitrogen products that are designed to have significantly less leaching, observe if these products improve row closure nitrogen.
- Move the most promising results for the most cost-effective nitrogen programs from the plots to the field scale and verify small plot trends carry over to the large scale.
- Provide community extension to demonstrate benefit and improve industry practice.

Strategies to Mitigate Phytotoxicity Caused by Foliar Applications of Phosphorous Acid

Principal investigator: Zack Frederick and Haider Abbas
Technician: Andrea Hamilton, Faryal Yousaf, Bev Mitchell, Alan Manns, Alex Christison
Summer students: Nicole Buurma, Olivia Gessner, Whitley McDonald

Previous research:

New in 2021

Objectives:

- Apply 10 L phos acid to investigate impacts of rate, time of day, volume on potato yield and tuber quality metrics (if any).
- Determine impact of any particular phos acid use pattern on foliar phytotoxicity.

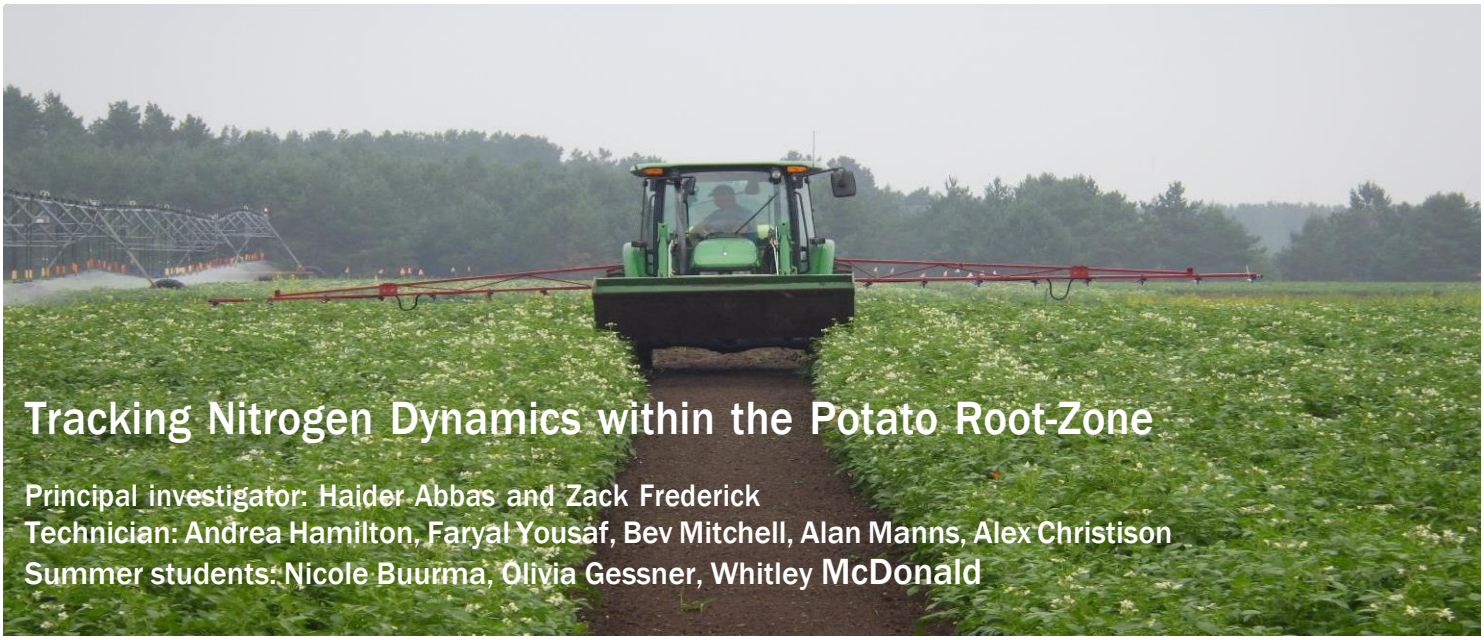
Future goals:

- Replicate the study across multiple years to establish consistent trends between different foliar use programs and impacts on yield, tuber size, quality, and foliar phytotoxicity.
- Model the relationship between environmental parameters such as percent relative humidity, air temperature, solar radiation and any phytotoxicity that is observed.
- Provide community extension to demonstrate benefit and improve industry practice.

Offsite Harvest Crew

Left to right:

Alan Manns, Bev Mitchell, Olivia Gessner, Nicole Buurma, Andrea Hamilton, Alex Christison, Zack Frederick



Tracking Nitrogen Dynamics within the Potato Root-Zone

Principal investigator: Haider Abbas and Zack Frederick
Technician: Andrea Hamilton, Faryal Yousaf, Bev Mitchell, Alan Manns, Alex Christison
Summer students: Nicole Buurma, Olivia Gessner, Whitley McDonald

Previous research and results:

- The study results from 2020-planting year showed a comparatively higher nitrate content within the 0.2 m depth. It indicates an adequate application of nitrogenous fertilizers within this depth.

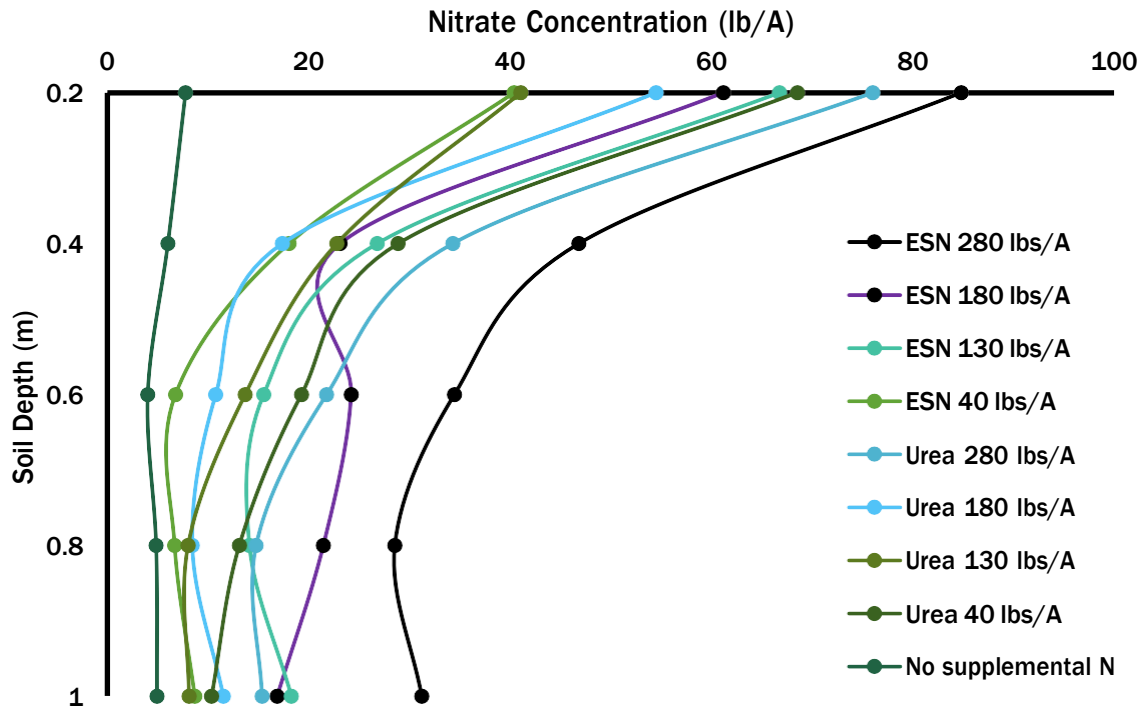


Fig. Nitrogen dynamics within the potato root-zone throughout the growing season

- A trend of nitrate leaching was observed within the potato root-zone with the progression of growth stages. It resulted in higher nitrate contents in the deeper depths compared to shallow depths in some ESN applied treatments.
- The decrease in nitrate content at 0.2 m depth and increase at 1.0 m depth in ESN = 280 lb/A treatment may be attributed to leaching down of unutilized nitrogen with percolation caused by irrigation and rainfall. As nitrates are readily soluble in water, nitrate leaching potential is directly linked to soil water dynamics within the effective root-zone.
- The potential risk of nitrate leaching increases with the accumulation of excessive nitrates within the root-zone combined with excessive irrigation and/or intense rainfall on well-drained sandy soils having low water-holding capacity.
- A higher amount of nitrogen application in sandy loam soil system facilitates the availability of nitrogen for plant growth. However, the application of a higher rate of slow released nitrogen is comparatively beneficial than Urea for better nitrogen use efficiency.
- Nitrate leaching potential from the effective root-zone was found significantly higher at tuber initiation stage, and tuber bulking stage. Tuber initiation and tuber bulking stages are sensitive to irrigation and nutrients stress.
- The supplemental irrigation was applied to the irrigated treatment during the tuber initiation, and tuber bulking stages. Overhead irrigation and rainfall coupled with favorable temperature facilitated the release of nitrogen from PCU/ESN granules in the plant-available-form. This accumulated nitrate may have been available to leach below the root-zone with the irrigation and rainfall events.
- In 2021 growing season, we compared treatments of ESN 280 lb/A, ESN 180 lb/A, and ESN 130 lb/A to track nitrogen dynamics within the potato root-zone under adequate irrigation application.

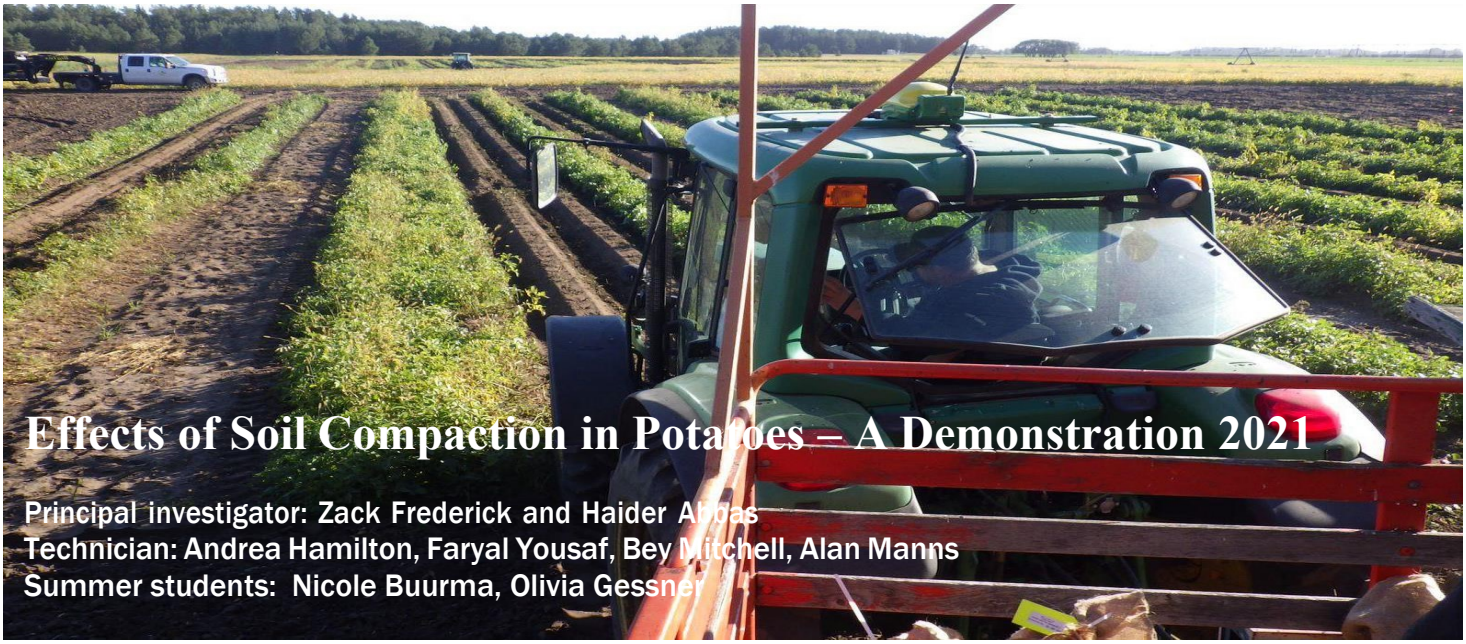
Objectives:

The objective of this study is to examine the effects of different nitrogen application rates on nitrogen dynamics within the potato root-zone in a loamy sand soil, and to analyze the nitrate leaching potential below the root-zone.

Future goals:

- In 2022, MCDC will enter into the 3rd year of this study. We aim to determine the impact of different rates of multiple nitrogen sources including ESN, SuperU etc. at the nitrate leaching potential of these sources within a potato production system.
- For a detailed report of this study, please access to the 2021 CMCDC Annual Report.

Faryal Yousaf works as Applied Research Technician at the Manitoba Crop Diversification Centre. She has the educational qualification in the areas of Organic Agriculture, Soil Science, Agronomy, and Agricultural Business Management. Faryal also got a degree in Master of Business Administration to enhance her project management skills. Born and raised up on a family farm and working with the resilient ag-industry in the Canadian prairies, she has got a significant experience in crop production systems, soil fertility management, field crops scouting, statistical data analysis, and report writing. Faryal has received Diploma in Website Development and Management from the University of Waterloo and she manages Crop Diversification Centres' website and twitter handle.



Effects of Soil Compaction in Potatoes – A Demonstration 2021

Principal investigator: Zack Frederick and Haider Abbas
Technician: Andrea Hamilton, Faryal Yousaf, Bey Mitchell, Alan Manns
Summer students: Nicole Buurma, Olivia Gessner

Background:

In simple terms, compaction can be described as the reduction of pore space in the soil – and how much compaction occurs as well as how much recovery from compaction is possible is affected by soil type. Kinds of compaction include surface compaction (especially under wheel tracks), plow or tillage pan compaction (just below plow depth) and deep/subsoil compaction. Soil compaction can influence plant growth by preventing normal root development. Compaction can threaten potato plants in a number of negative ways. Compaction can cause several problems, many of them long term. It results in decreased plant growth because the plant has difficulty growing larger roots and this obviously curtails nutrient and water uptake. There can be less available water in compacted soil, but compacted soil that's saturated can also lead to soil denitrification and reduced soil oxygen, which can, in turn, result in reduced root growth and nitrogen and potassium deficiency. Uneven planting depth and sidewall smearing is also common with compacted soil, as is an increased risk potential for erosion.

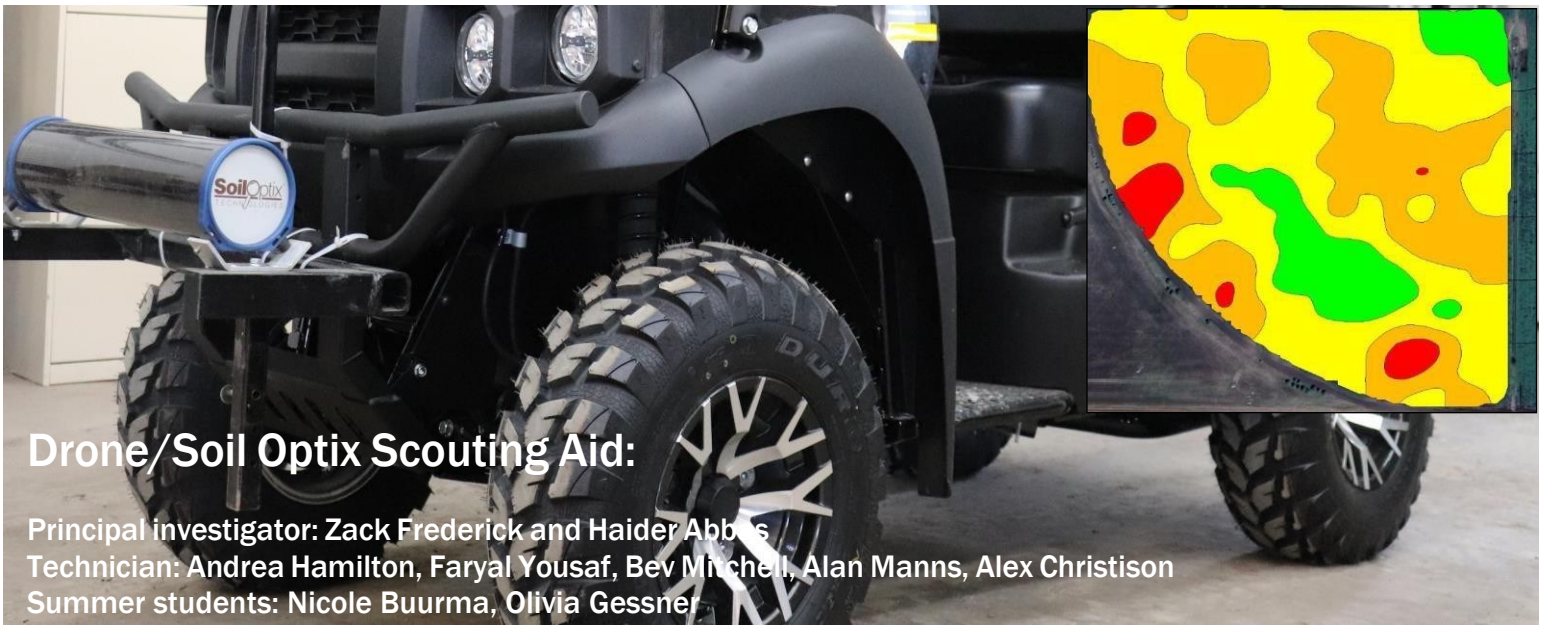
Lastly, compacted soil can also increase risk of seedling disease. In Manitoba, potatoes are grown in many types of soil. Although compaction is a bigger concern in soils with greater clay or silt content, the limited root growth and tuber formation is observed in all soil types.

Objectives:

1- To determine the impact of compaction on potato root density.
2- Impact of compaction on soil moisture availability within the potato rootzone.
3- Track the impact of compaction on nutrients availability within the potato root-zone.
4- Study the effect of compaction on total potato yield.
5- Demonstration of in-field impact of compaction to potato producers in a field day event or through a knowledge transfer video recording.

Results:

The results of this study/demonstration would be available in the 2021-Annual Report.



Drone/Soil Optix Scouting Aid:

Principal investigator: Zack Frederick and Haider Abbas
Technician: Andrea Hamilton, Faryal Yousaf, Bev Mitchell, Alan Manns, Alex Christison
Summer students: Nicole Buurma, Olivia Gessner

Previous research and results:

- First Optix scan and map of offsite 2 made in early 2021.
- First Optix grower field scan done in fall 2021. Thirteen fields scanned over fall 2021.
- Optix will be able to scan fields and provide topographical nutrient variability maps before and/or after harvest
- Drone program active 2017-2020, NDVI images taken of grower fields, discovery that NDRE (NDVI + infrared image) better measure of canopy health.

Objectives:

1- Identify if treatment impacts areas impacted nitrogen, sulphur, Verticillium wilt
2- Determine if a given fertilizer, green manure, other treatment is cost-effective by identifying and quantifying with a propensity for problems using the soil optix, applying treatment, using the drone to identify if the impacted crop canopy area is smaller than the original problem area, and using the variability study to estimate what the restoration of yield over the improved area netted the grower after the cost of application is factored out.

Future Goals:

- Use the optix to scan grower fields to determine propensity for nutrient deficiency and quantify area(s) with deficiency in the field, use zone map to select sample points that demonstrably represent the complete range of variability in the field.
    - Uses few sample points to represent a larger area than previous studies.
- Use the drone to take images at row closure and preharvest.
    - Images are NDRE to get a better numerical measure of canopy reflectance.
    - Correlate reflectance with nutrient/disease problems.
        - Ground truth to verify.
    - Quantify areas of unique canopy reflectance that correlates to sulphur, nitrogen deficiency, Verticillium wilt, etc.
- Examine the difference between areas that are supposed to be deficient, as indicated by the Soil Optix, to areas that are actually deficient according to drone imagery. The amount of deficiency land that decreases from Soil Optix to Drone Imagery could be due to positive treatment effect. Given information from the variability study, an estimate can be made on the actual dollar value and yield improvement

Impact Assessment of Management Practices to Control Soil Erosion in Potato Farming Systems

Previous research and results:

- Anecdotes from growers have been recorded from the mustard biofumigation project where treatments visibly reducing blow over winter and spring led to interest in ways of quantifying this observation.

Objectives:

1- Research, devise and construct tools to quantify the size of particles and amount of soil.
2- Use these tools in cover crop/green manure, black dot vine removal studies to capture an additional aspect of soil health.
3- Identify which cover crop/green manures and other practices have the greatest impact on decreasing wind erosion.

Evaluation of Variable Rate Irrigation Application on Tuber Yield and Quality

Previous research and results:

- Several growers have VRI systems, but community anecdote suggests these systems are not used to their fullest extent.
- MCDC's VRI system primarily used to allow contiguous experiments to be simultaneously watered while having different water requirements.

Objectives:

1- Establish MCDC Offsite VRI for research in irrigation efficiency (such as available soil water, irrigation depth based on texture and amount of water applied, etc).
2- Enable community confidence in creating and using VRI prescriptions to facilitate the use of existing infrastructure.
3- Generate conversation between industry and research partners to list and pursue future irrigation research.

MANITOBA CROP DIVERSIFICATION PROGRAM

Introduction:

The Manitoba Crop Diversification Centre (MCDC) is established between the Government of Manitoba, and Manitoba Horticulture Productivity Enhancement Centre Inc. (MHPEC). The Diversification Centre's mission, in brief, is to facilitate the development and adoption of science-based solutions for agricultural crop production. This is accomplished through the design, development, and adaptation of best management practices with a focus on water management, crop diversification and environmental sustainability. Its strategic areas include sustainable irrigation, sustainable potato production, improving the environmental sustainability of intensive crop production, and crop diversification.

In 2021,

The Crop Diversification program conducted 46 small plot field research trials at MCDC and off -sites. Following trials were performed during the 2021-growing season with the objective of variety evaluation, development of best agronomic practices, nutrient management, protein testing, crop-livestock integration, and climate resilience:

Cereals:

Collaborators: MCVET, University of Manitoba, Ducks Unlimited Canada, Manitoba Crop Alliance, AAFC Ottawa

1- Winter Wheat Variety Evaluation
2- Winter Rye Variety Evaluation
3- Development of decision support tools for fusarium head blight management in Western Canada
4- Winter Wheat Fertility Agronomy
5- Wheat Seeding Rate Trial
6- Barley Seeding Rate Trial
7- Oat Seeding Rate Trial
8- Evaluation/selection of Parent lines adapted to Carberry region.
9- Inbred Corn Variety Evaluation
10-Evaluation of Corn for Goss's Wilt Resistance
11-MCC corn hybrid evaluation trial (seed guide)

Pulses:

Collaborators: WADO, MCDC Internal, ARD, Manitoba Pulse & Soybean Growers

12-Fall-Spring Lentils Adaptation
13- Dry Beans Test
14- MCVET Peas Variety Evaluation
15- Effect of fertilizer management on agronomic and economic performance of Black Bean - Fertilizer N rate and inoculant
16- Effect of fertilizer management on agronomic and economic performance of Black Bean - Fertilizer P rate and placement
17- Effect of fertilizer management on agronomic and economic performance of Pinto Bean - Fertilizer N rate and inoculant
18- Effect of fertilizer management on agronomic and economic performance of Pinto Bean - Fertilizer P rate and placement
19- Impact of Nutrient Management on Protein Content of Soybean - Variety Trial - Phosphorus Study

Oilseeds:

Collaborators: MHPEC Inc., M21 Saskatchewan, ARD, Manitoba Crop Alliance, MCDC Internal, MCVET

20- Evaluation of planting date, flea beetle control, minimum inputs (irrigation, N+S fertilization) needed to achieve max biomass, seedbed preparation (stubble type, chaff spreading, best seed-to-soil contact ratio) for mustard biofumigation process
21- Characterization of agronomic practices for mustard cultivars 'AC Volcan', 'Caliente Rojo', and 'Cutlass' necessary to achieve maximum biomass to theoretically maximize glucosinolate production.
22- Development of Agronomic Recommendations to produce maximum biomass for Mustard Biofumigation Process
23- Evaluation of seeding dates and nitrogen application on biomass production in Brown Mustard under irrigated system
24- Evaluation of seeding dates and nitrogen application on biomass production in Brown Mustard under non-Irrigated
25- Development of list of recommended and experimentally verified practices to successfully use mustard biofumigants as part of program to manage Verticillium wilt in Manitoba - Producers Fields.
26- Winter and Spring Canola Demonstration
27- Sunflower Variety Evaluation - Oil
28- Sunflower Variety Evaluation - Confectionary
29- Sunflower Harvesting Test
30- MCVET Flax Variety Evaluation

Special Crops:

Collaborators: ARD, Phillex Quinoa, MCDC Internal

31- Crop Nutrient Uptake in Buckwheat
32- Quinoa Variety Evaluation
33- Hops Variety Evaluation

Forages:

Collaborators: Manitoba Forage & Grassland Association, PCDF, MCDC internal

34- Alfalfa Forage Trial
35- MCVET Annual Forage Test
36- Hemp-Cereal Silage Intercropping
37- Pea-Cereal Silage Intercropping
38- Impact of Nutrient Management on Protein Content of Silage Corn
39- Impact of Seeding Agronomics on Corn Silage Crude Protein
40- Corn Variety Evaluation for Protein Content of Silage Corn

Horticulture: with MHPEC

41- Variable Rate Irrigation Testing in Potatoes
42- Development of a Decision Support Tool (DST) for Potato Irrigation Scheduling using Soil and Weather Data Modelling.
43- Evaluate whether mustard biofumigation with "Caliente Rojo" reduces Verticillium dahliae soil CFU and/or Verticillium wilt of potato
44- Tracking Nitrogen Dynamics within the Potato Root-Zone
45- Controlling Soil Erosion in Potato Farming Systems
46- Effects of Soil Compaction in Potato Crop

Results of these trials will be available in the 2021 MCDC Annual Report at mbdiversificationcentres.ca

For your questions and feedback on the diversification program, contact Haider at haider.abbas@gov.mb.ca

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Zack Frederick – Applied Research Agronomist
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Sherree Strain – Office Administrator
mhpec1@outlook.com

Support Staff:

MHPEC's research program is supported by a research technician and seasonal staff.

Andrea Hamilton started as MHPEC's applied research technician in the spring of 2021. Andrea completed her agriculture diploma in livestock management at the University of Manitoba before she continued her education to complete her Bachelor of Science in Agronomy in 2019. Andrea began working in the potato industry in the 2018 growing season with Stolon Glance Agronomy and continued there for three more growing seasons. After graduation, during the winter of 2019, Andrea worked as an agronomy intern at McCains in Carberry. Andrea has a diverse knowledge base within agriculture with working in livestock, potato, grain, and green house hydroponic systems. Andrea also has a background in regenerative agriculture with taking the soil health academy course and presently taking the Soil Food Web course. Andrea's current roles include the implementation of MHPEC research projects such as planting, irrigation, collecting soil and plant samples, grading and analysis.

Sherree Strain, Faryal Yousaf, Beverly Mitchell, Alan Manns, Alex Christison along with summer students, are critical staff members whose efforts are essential for work at the research site.

Our Team

Back row (left to right): Andrea Hamilton (Applied Research Technician, Potato), Sherree Strain (Office Administrator), Garth Christison (Centre Manager), Zack Frederick (Applied Research Agronomist), Alan Manns (Field Manager), Bev Mitchell (Technician)

Front row (left to right): Olivia Gessner (Summer Student), Whitley McDonald (Summer Student), Nicole Buurma (Summer Student)

Missing: Alex Christison (Field Operation Technician), Haidar Abbas (Applied Research Specialist), Faryal Yousaf (Applied Research Technician)

For project reports and recommendations,

please visit mbpotatoresearch.ca for our 2021 Annual Reports