

DIVERSIFICATION CENTRES

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Applied Research & Extension



Variable Rate Irrigation to Enhance Water Use Efficiency in Potatoes

By Haider Abbas

Variable rate irrigation (VRI) is an innovative area of study for both potato growers and researchers. This technology may increase the crop productivity and improve water usage efficiency. Beginning in 2023, Manitoba Crop Diversification Centre (MCDC) is conducting a five-year research study to examine some of the most important issues surrounding the VRI application in potato production. The Manitoba potato growers, who are currently using this technology on their farm, have identified some research questions for the MCDC scientists. The MCDC recently upgraded its irrigation application system to use the variable rate irrigation option, which created the opportunity to do a detailed study on precise water management. The VRI may increase the effectiveness of water and energy inputs and reduce over-irrigation related issues. The main objective of this study is the use of VRI technology to decrease the variability of available soil water across the field and demonstrate the benefits to potato yield and uniform quality.

WHAT'S NEW

Diversification Centres Getting Ready for Spring Planting

Manitoba's Diversification Centres conduct applied research trials in collaboration with provincial Crop and Livestock Specialists, industry stakeholders, academic institutions and local producers to develop sustainable agronomic solutions for cereals, corn, oilseeds, pulses, special crops, forages, and potatoes. As the weather starts to finally warm up in Manitoba, Diversification Centres are getting ready for planting research experiments for the 2023 growing season. The research staff has been busy in the last few weeks prepping their machinery for spring seeding. Applied Research Specialists at the four Diversification Centres will be keeping a close eye on the fields as the snow quickly disappears.

Dormant Seeded “Winter” Crops Results Update

By Scott Chalmers

Seeding in the “shoulder seasons” such as fall or early spring can spread out the workload from the regular seeding and harvest seasons as well as buffer against adverse weather conditions during regular grain farming times. The Westman Agricultural Diversification Organization (WADO) has partnered with Ken Greer of Western Ag & Professional Agronomy who had provided WADO with winter tolerant crop seed such as winter oat, winter barley, winter pea and winter lentil. These were compared to winter wheat and spring wheat types in an early spring dormant seeding timing. On April 8, 2023, just before the two blizzards hit southern Manitoba, WADO seeded dormant winter crops, near Melita, MB. A weather station was nearby to monitor both soil temperature and air temperature each hour thereafter. Replicated plots were established with normal agronomic recommendations as spring crops in the area. The weather station recorded approximately 340 hours post seeding of time between the soil temperatures of 0°C and 8°C thought to be the best temperatures for vernalisation of winter wheat.



Left to right: Wheat guard, Wildfire winter wheat, winter pea, winter barley, spring wheat, winter oat, Goldrush winter wheat, winter lentil. (Picture taken on Aug 5, 2022)

During the 2022 planting year, most crops including winter wheat had some reduced plant counts at six weeks compared to two weeks after emergence, except lentil which increased in count. Interestingly, winter wheat headed out under this short vernalisation period and matured later than the spring wheat. However, all were significantly delayed in maturity compared to normal seeding dates, for example, spring wheat is normally 101 days to maturity but in this case, it was 120 days.

In terms of yield, all fall crops under-yielded comparatively to normal spring seeded crops in the site they were grown. Despite this short fall, the dormant seeding concept proved to be successful. Otherwise, producing modest yields in all crops except lentil which yielded much less than normal spring seeded lentil should yield 3000 kg/ha in this area.

The following results tables depict the final results.

Dormant Seeded Crop	Variety	Date of Flower/Head	Days to Maturity	Yield kg ha⁻¹	*S.D.
Winter Wheat	Wildfire	18-Jul	138	1319	514
	Goldrush	15-Jul	126	2972	216
Spring Wheat	Brandon	29-Jun	120	3353	125
Winter Peas	Blaze	29-Jun	119	2198	445
Winter Barley	Endeavor	11-Jul	120	5139	230
Winter Oats	R30 (21)	04-Jul	112	4142	356
Winter Lentils	Super Cool	29-Jun	129	360 [^]	-

Days to Maturity = days from seeding to maturity
 *Standard Deviation (from the mean)
[^]the material of all three lentil plots were combined due to poor yield then divided by 3 plots

2022 Results from Other Spring Seeded Trials for Comparison				
Crop	Seeding Date	Days to Maturity	Harvest Date	Average Yield kg ha⁻¹
Fall Seeded Winter Wheat	2021-09-10	-	2022-08-12	6771
Spring Wheat	2022-05-05	-	2022-08-22	4691
Spring Barley	2022-05-05	89	2022-08-12	5893
Spring Oats	2022-05-05	90	2022-08-16	6415
Spring Field Pea	2022-05-06	86	2022-08-10	4421

All values are averages taken from all varieties and reps in the trial. These values were collected to compare to the winter crops that were grown at the same site.

For more information about winter crops and their agronomy, please contact:

Scott Chalmers

Applied Research Specialist

Westman Agricultural Diversification Organization (WADO)

Manitoba Agriculture

Office: 139 Main St. Melita MB ROM 1L0

Cell: 204-522-5415; Email: scott.chalmers@gov.mb.ca

PESAI Annual General Meeting held in Winnipeg

The Prairies East Sustainable Agriculture Initiative (PESAI) held its 17th Annual General Meeting (AGM) on April 3 in Winnipeg. The AGM started with tour of MacDon industries in west Winnipeg. MacDon is known to make harvesting equipment and parts for agricultural equipment. Participants also visited their storage facility. Afterwards, the AGM was held at Half Pints Brewing facility. Nirmal Hari made a presentation on "Small farming systems in Northern India - Sustainability & Challenges." This presentation generated many questions to know how farmers survive from such a small acreage. Lastly, the PESAI staff presented 2022-23 financials, research work done during 2022 and plans about 2023 research. An election was held to elect new board directors. Andy Buehlmann, Gary Naurocki & Paul Gregory were elected for a 3-year term.

Two Regenerative Ag Focused Projects starting at PESAI

By Nirmal Hari



The PESAI Board decided to initiate long term studies pertaining to regenerative Ag research. Two such projects will be starting this year. First project is in collaboration with the University of Manitoba in which cover crops will be tested on tiled plots to see if they can affect water and nutrient outflow from the tiled land. One Ph.D. student will work on this project. Cover crops will be incorporated in Wheat - Canola crop rotation. Second project is in collaboration with Manitoba Forage & Grasslands Association in which grain mono cropping systems will be compared with grain intercropping & perennial cropping systems for their effects on soil health and return over investment. Both projects will have bigger sized plots (individual plot area more than 250m²).

PESAI Board Welcomes New Director Paul Gregory



Paul Gregory

PESAI Board Director

Paul Gregory is a professional agronomist who has farmed for over twenty years at his family farm in Fisher Branch. He has experience in forage seeds, leafcutter bees and honeybees. He is now consulting with both organic and conventional seed growers as owner operator of Interlake Forage Seeds Ltd. Paul is managing Interlake Honey Producers with his son, Campbell and wife, Anita. Their honeybees provide pollination through the North Interlake for seed growers and special crop growers. Paul has sat on many producer boards and always has an open mind for new farm practices that improve margins and increases soil health.

Corn Intercropping Strategies for Fall/Winter Grazing of Beef Cattle

By James Frey

Finding innovative ways to extend the grazing season in western Canada continues to be at the forefront of winter feeding for many cow-calf producers, particularly when being faced with trying to “get more from less” when it comes to available land for cattle grazing and feed production. As cattle typically graze on grass/legume forages in the summer that sharply decline in quality in fall/winter, a high-quality stockpiled forage for extended grazing is crucial to maintaining animal productivity. Compared to perennial stockpile grazing for example, corn yields a large volume of feed per hectare, allowing more output from a smaller area. Corn also provides an effective wind break and abundant energy that helps cows through cold winter months; however, its low crude protein content results in unbalanced energy: protein ratio which restricts rate of liveweight gain, therefore limiting the suitability of this winter grazing system for not only mature beef cows (when under extreme cold conditions) but also growing cattle with high nutrient demands. Partnering with the beef and forage industry, and using a range of agronomic, animal and economic analyses, this project will identify the potential feasibility for intercropping corn with high protein forages to increase the nutritive value of these mixed stands for beef cattle grazing in late fall/early winter under western Canadian winter conditions. Investigation of agronomic management practices for intercropping corn will provide flexible options to increase adoption across the Prairies. With growing interest in intercropping, crop-livestock integration, and regenerative agriculture, novel grazing strategies that will enhance the long-term resiliency, adaptability, competitiveness, and profitability of Canadian beef production are critical.



Corn and Italian ryegrass



Crimson clover

A two-year, small plot study was initiated in the 2022 planting year at the Parkland Crop Diversification Foundation (PCDF). Corn on 60-inch row spacing was intercropped with either Italian ryegrass, crimson clover, hairy vetch, grazing radish and compared to a corn only control seeded on 30 in row spacing. Corn was seeded in late May and intercrop seeded at V4. Establishment was determined by in season plant counts and in late September and early November, biomass yield of the corn and intercrop were determined. Additionally, the chemical composition of the corn and intercrops were also determined to evaluate their potential nutritive value for beef cattle. Data analysis is presently ongoing but early results from PCDF indicate that intercrop crude protein content ranged from 14 - 23%, showing promise to add supplemental feeding value to corn stands.

Staff Recognition at PCDF

A precision machine cannot run without a team of professionals to keep its parts oiled and its bolts tight. Parkland Crop Diversification Foundation (PCDF) is fortunate to have talented and dedicated staff who are committed to ensuring that the organization meets its objectives of putting essential agricultural research information into the hands of farmers and other stakeholders.

Here is a brief introduction to the staff responsible for PCDF's day-to-day operations:



Jessica Frey

Jessica has worked with PCDF since 2016. Her main role is data management, ensuring that all the information is collected at the right time during the growing season. She loves flowers and spends her summer evenings pulling weeds in her perennial garden. Her favourite food is 牛肉面 (Chinese beef noodles).



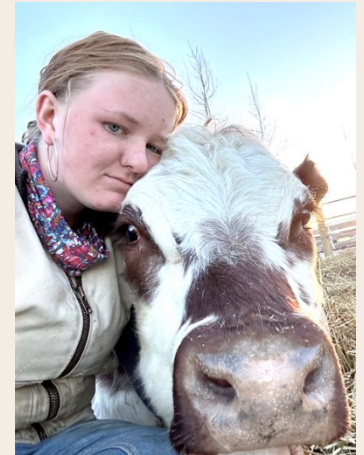
Brooklyn Bartel

Brooklyn started at PCDF as a summer student in 2018. She now works as a technician, driving equipment and collecting plot data. She is passionate about her flock of 116 sheep, and is always looking for ways to improve her operation. Her favourite foods are homemade cottage cheese perogies and chocolate (but not necessarily together).



Sara Marzoff

Sara began working with PCDF in 2021. Her time is divided between the office, managing PCDF's finances, and the field, where she has a hand in implementing the research trials. She can be seen about town with her well-dressed Chihuahua-Yorkie. Her favourite food is cold vegetarian pizza with extra olives and pineapple.



Ella Marzoff

Ella started with PCDF as a summer student in 2021. She helps to execute the research trials and volunteers to do all the heavy lifting. She has a vital role in the family's 70-head cow-calf operation. She is crazy about any kind of soup.



PCDF

For more than 25 years, PCDF has conducted applied research to evaluate, demonstrate and facilitate the use of new crops, technologies and value-added opportunities. Located in Roblin, MB, PCDF's areas of research include testing for new crops and varieties, forages and crop-livestock systems, intercropping and cover cropping, and soil management. For more information about PCDF projects and research interests, please contact:

James Frey

Applied Research Specialist

Parkland Crop Diversification Foundation (PCDF)

Manitoba Agriculture

Cell: 204-247-0346; Email: james.frey@gov.mb.ca