





FERTILIZER CANADA

The 2017 Fertilizer Canada Manitoba Demonstration Farms focused on these three projects:

- demonstration trial.
- 2. Partnership with Marsh River Farms Ltd demonstrating grain corn a 4R

Nitrogen management trial.

to the industry & public concerning their 4R nutrition research.

1. R & D McLean Farms Ltd

This past 2017 growing season, Robert and Don McLean from Manitou, Manitoba (south central MB – located along the North Dakota border) participated with a canola 4R Nitrogen demonstration farm.

All aspects of 4R Nutrient Stewardship management practices were evaluated at this site. Enhanced Efficiency Fertilizer (EEF) products along with Urea, were mid-row banded (MRB) at multiple rates. There was also a strip within the trial that had seed placement of EEFs - such as Environmentally Smart Nitrogen (ESN). The following attachment (Page 9) outlines the demonstration farm schematic.



4R demonstration farm site at R&D McLean Farms.

MANITOBA 4R DEMONSTRATION FARM SUMMARY 2017 Report

Submitted by: Steve Barron, CCA **Double Diamond Farm Supply**



FERTILIZER CANADA FERTILISANTS CANADA MANITOBA 4R NUTRIENT DEMONSTRATION FARM SUMMARY 2017 Report



1. Partnership with R & D McLean Farms Ltd developing a canola 4R Nitrogen

3. Assist Mario Tenuta's University of Manitoba (U of M) group with their communication

As a general summary concerning the growing season of this site, it went well with no major adverse environmental conditions. This site started with adequate soil moisture and received approximately 5.5 inches throughout the growing season. This would be considered slightly lower than normal average precipitation for this region. The precipitation at this site was received at very crucial stages of the canola crops physiological development. The initial mid slope GIS referenced soil test indicated very low levels of Nitrate (12 lbs N0,-N) present in a 0-24 inch core. These low levels of available N set up a great site area for Nitrogen (N) crop response. The soil would be classified as clay loam with the soil test revealing the organic matter as 5.6 in the 0-6 inch core and 3.1 in the 6-24 inch core.

The seeding tool used at this trial was a Bourgault 3310. This particular seeding tool has 10 inch seed spacing with the capacity to mid row band (MRB) and/or seed place fertilizer. The elevated rates of Urea (>100 lbs actual N) MRB, did create lodging issues which lowered yield from the average N rates. MRB rates using EEFs did consistently out yield the urea MRB equaled rates.

The EEF products also demonstrated less lodging which contributed to these higher yields. An interesting

evaluation was the higher yields built with lower EEF rates than elevated & equaled Urea rates. This may point to productivity and profitability increases with optimal nitrogen. These increased stewardship efficiencies benefit the environment as well as all stakeholders involved.

We also noticed in the demonstration strip that involved 30 lbs actual ESN and 20 P₂O₅ as MAP seed placed (10 inch spacing) had a 10 per cent negative impact concerning seed mortality. This observation was not ground truthed by replicated plant counts, but visually you could notice that at the four to six inch leaf crop stage there was a lower plant population vs. the surrounding strips. The amount of nutrients used in this strip must have been the cause of this seedling mortality drop. There are many factors that need to be taken into consideration with seed placed nutrition:

Rates of Nitrogen & all nutrition products seed placed.

- Salt content of the fertilizer used.
- Per cent seed bed utilization (SBU) & seed row spacing.
- Soil type.
- Soil moisture & temperature.
- Seeding tool placement. (Disk vs. Knife)
- Seeding tool ground speed.
- Seeding tool fan speed.
- Seeding tool fertilizer & seed delivery plumbing system.



The Marsh River group participated with a 4R Nitrogen corn demonstration farm in 2017. The synthetic Nitrogen fertilizer & manure was applied in the fall of 2016. This Nitrogen consisted of multiple ESN and Urea blends, along with chicken manure.



John Heard, with Manitoba Agriculture, Food and Rural Initiatives, discussing EEFs at the R&D McLean Farms 4R demonstration site.





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Harold Janzen addressing the 2017 4R Demonstration Farm Tour concerning the field agronomic history.

3. Mario Tenuta's Present & Future Of 4R Crop Nitrogen Tour Summary (June 28, 2017, Carmen, Manitoba)

The tour was well attended, with approximately 45 individuals representing agriculture producers, industry and government. The content of the tour consisted of Nitrogen 4R management research demonstrations

John Heard (MB Provincial Nutrition Specialist)



was demonstrated as fall applied NH₃, along with in-season Y droplet technology which places liquid N on the soil surface near the base of the established corn plant.

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with corn and wheat production. The continuing adaptation of EEF products (Enhanced Efficiency Fertilizers) was a large focus of the work provided by Mario Tenuta's group.

Mario Tenuta and the research group discussed corn Nitrogen management with a focus on placement. This placement





Tour attendees in a corn field with Y-droplet nutrient applicator technology.



Boot System Y-droplet nutrient applicator technology.



Y-droplet nutrient application technology.

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Amy Mangin (University of Manitoba Soil Fertility Technician)

Amy provided a walking tour of the second field season of spring wheat field trials designed to update nitrogen recommendations for high-yielding spring wheat varieties in Manitoba. The project objectives are to determine appropriate Nitrogen rates based on yield and protein goals, as well as the most effective combination of timing, placement, and source of Nitrogen fertilizer. Additionally, tools for predicting in season Nitrogen sufficiency and potential mineralization of organic soil Nitrogen have been investigated. Trials will be conducted at eight sites across Manitoba in the 2016 2018 growing seasons. The data and observations from the previous years of work is itemized in graphs included in the appendix.

Acknowledgements

Appreciation is expressed to the following organizations and their people for their partnership and dedication culturing this 4R Nutrient Stewardship initiative;

• All demonstration farm producer partners;

R & D McLean Farms Ltd

- Robert & Marina McLean
- Don & Stephanie McLean

Marsh River Farms Ltd

- Harold & Cindy Janzen
- Lorne Janzen
- Marvin & Mildred Janzen
- Marshall Janzen
- · All producers who attended our summer demonstration farms tours.

- John Heard, Mitch Timmerman & all Manitoba Agriculture staff involved with implementation of this project.
- Mario Tenuta from the University of Manitoba and his staff for their contribution with demonstration farm work and tour event participation.
- Amy Mangin, Soil Fertility Technician from the University of Manitoba.
- Allan Dawson from the Manitoba Co-operator.
- Industry partners; Mitch Poiron from Agrium & Regas Karamanos from Koch Fertilizer.
- The Manitoba Memorandum of Understanding group and Fertilizer Canada for its continued support.

Appendix

- **EEF** Enhanced Efficiency Fertilizer
- ESN Environmentally Smart Nitrogen
- GIS Geographic (or Geospatial) Information System
- MRB Mid Row Band. The placement of fertilizer in between the rows of seed
- MAP Monoammonium Phosphate. This is a dry granular form of Phosphate.

SBU % - Seedbed Utilization percentage is a term that has been developed to describe the effect of row spacing and the opener type on seed furrow fertilizer concentration.



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ι	1	UREA	90	MRB	E
2	1	UREA	80	MRB	
3	1	UREA	100	MRB	
ł	1	UREA	120	MRB	
;	1	UREA	140	MRB	
;	2	SUPER U	120	MRB	
1	2	SUPER U	100	MRB	
3	2	SUPER U	100	BROADCAST	
	2	SUPER U	80	BROADCAST	
0	2	SUPER U	80	MRB	
1	2	SO%ESN/SO%UREA	80	MRB	
2	2	50%ESN/S0%UREA	100	MRB	
3	2	50%ESN/S0%UREA	120	MRB	
4	2	30ESN-20P SEED PLACED & 60N AS 50%ESN/50%UREA MRE			

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Thank you to R & D Mclean for creating this site.

MANITOBA 4R DEMONSTRATION FARM SUMMARY 2017 Report



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Present and Future of 4R Crop Nitrogen Management Tour Wednesday June 28, 2017 9:00-1:00

Target Audience: Growers, Consultants, Reps, Research Funders, Students Cost of Admission: Willingness to Ask Questions

Schedule

9:00-10:00 Stop 1 (Five Corners): Fall/Spring Enhanced Efficiency N Spring Wheat 10:25-11:20 Stop 2 (Carman): N Management of Corn 11:40-12:20 Stop 3 (Carman Station): N Management for Protein in Spring Wheat 12:30-1:00 Hot Lunch at Carman Station

Stop 1 and Presenters

Mario Tenuta, U Manitoba – 4R management and what it means for the future?

Lanny Gardiner, U Manitoba – Trial walk about Matthew Wood, U Manitoba– What's up with N2O? Steve Baron, Double Diamond- What source of N to use?

Stop 2 Presenters

John Heard, MB Ag – Getting best use of N in corn

John Heard, MB Ag- Trial walk about Adam McKnight, Pioneer– Demo: Soil nitrate testing isn't just for the lab anymore John Heard, MB Ag- Demo: In season plant testing for corn N

Stop 3 Presenters

Amy Mangin, U Manitoba - Need and Strategies to Get Higher Protein in New Wheat Varieties Amy Mangin, U Manitoba – Trial walk about

Stop 1

Look for Road Signs; Snacks, Coffee, Drinks and Lunch Provided



RSVP by email mario.tenuta@umanitoba.ca On tour day call 204-290-7827 with issues



be coming in the future

I ncreasing yields while apply-ing the same or less nitrogen is good for farmers and the





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MANITOBA 4R DEMONSTRATION FARM SUMMARY 2017 Report



BETTER NITROGEN

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ontinued from page 17 The tour stopped at one of Carman farmer Tyler Russell's cornfields, where opera-tor Rod Owen applied liquid nitrogen (UAN) with a high-clearance applicator. Y-shaped hoses drop from the boom and are dragged along each corn row distributing liquid nitrogen.

The C.R.O.P.

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For a complimentary farm revenue management assessment, contact:

David Derwin

844-982-0011

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protection you need

COLUMN T

Optimize your production, storage & sales decisions

which are in the Canada Western Red Spring and Canadian Northern Hard Red Canadian Northern Hard Hed classes, respectively. Data from 2016 showed when the same amount of nitrogen was applied, Prosper consistently outyielded Brandon by eight to 14 bush-els an acre. However, Brandon consistently had 0.1 to 2.2 per cent more protein than Prosper. because it's a framework to get this suite of practices to increase nitrogen use efficiency."

"The 4Rs I like

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well, but they may be bleeding product,

Argmetrix, echoes the 10 per cent threshold, and wire states. The woor more nozzles are worn, replace all works. In most cases, Kynoch sid, a calibrator is new term to the blog advises. In most cases, Kynoch sid, a calibrator is new term to the threshold, and wire quickly add up into the hundreds of dollars. Hito own company's calibrator range from \$200-\$300. The new state cases and beek ther ther morzles and the threshold, and wire quickly add up into the hundreds of dollars. Hito own company's calibrator range from \$200-\$300. The new state cases and beek ther ther morzles and the how all the nor to beek ther ther morzles and the advised calibrator is new term to have nozzle calibrator is new term to have nozzle calibrator and checking the flow rates through them. It can show ounderapplying, If your patter to (or) if you're going to be lack ing coverage. (or) if you're going to be lack-



Matt Kynoch, solutions supply specialist with Enns Brothers, demonstrate a worn spray nozzle at the June 22 Canolapalooza event in Portage la

Industry pushes farmers to test spray nozzles Nozzles may appear to be functioning

Kynoch rec

mmends that

The Manitoba Co-operator | July 6, 2017

Canolapalooza attendees heard June 22

BY ALEXIS STOCKFORD Co-opensitor staff By the time spray noz-losing you money. That is according to Matt kynoch. Solutions survey spring before spraying starts. Sprayers 101 suggests calibrate their nozzles every spring before spraying starts. Sprayers 101 suggests calibrate the ground speed and operating pres-sure have been calculated.

losing you money. That is according to Matt Kynoch, solutions supply specialist with Enns Brother at Canolapalooza, held in Bortage la Praine June 22. "If you can visually see the spray pattern's not the other, especially than does of the Instructors at Canolapalooza, held in the spray pattern's not the other, especially than the other, especially than the other in tozzle for most accu-time, your nozzle's proba-calibration methods, but a few acres, Kynoch said. He recommended that nozzles be replaced once excess spray reaches 10 per cent over specifications. Sprayers 101, an online resource for farmers co-founded by Tom Wolf of Argmetrix, echoes the 10 per cent in et as of a dipatick in the case of a dipatick area or if the dipatick is out area or if the output is out area or if the dipatick is out area or if the output is out area or if the output is out area or if the output is output is output outpu





spring for high-yielding strategies in Manitoba management wheat

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D. Flaten¹, J. Heard²

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e and efficient combinations of timing pecially for midseason applications. as uring potential mineralization of organic during the growing season. r midseason evaluation of N sufficiency. ieas sed for cools

Methods

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2017 Report







The 4R nutrition concept is becoming widely adapted as a positive movement forward in our Manitoba region. The partnership of our academic institutions, government, and industry will be key to the continued success of 4R nutrition management in agriculture.

Rate Response Summary, 2016

3.1

2.5

2.4

2.1

1.1

0.9

2.6

2.2

NS

80+30 PA Uhea