

Station 3: Canola Grain Yield

2020 MSSS Drop-in Tour — 4R Canola N Management

- ✿ Results are from Cropping Year 1 (Oct 2018 to March 2020).
- ✿ Implemented fall, spring and in-season treatments at two farmer fields near St. Claude MB.
- ✿ Each site had 28 treatments with each at 1× (Table 1a) and 0.7× (Table 1b) recommended N, with four replicate plots per treatment for a total of 224 plots at each site.
- ✿ The recommended N rate at both sites were 86 lbs N/ac.
- ✿ Mean grain yields (9% moisture) across two sites are reported.

Table 1a. Fertilizer treatments in Cropping Year 1 according to 4R practices (rate, source, time, placement) for 1X recommended N application rate.

Trt #	rate (lbs N/ha)	At plant			In-season N top dressing			
		Source	Time	Placement	rate (lbs N/ha)	Source	Time	Placement
28	0							
27	60	Urea	Spring	Shallow MRB				
1	86	Urea	Fall	Surface Broadcast				
3	86	Urea	Fall	Shallow MRB				
9	86	Urea	Fall	Deep MRB				
2	86	SuperU	Fall	Surface Broadcast				
5	86	SuperU	Fall	Shallow MRB				
4	86	70%ESN:30%Urea	Fall	Shallow MRB				
7	86	eNtrench Urea	Fall	Shallow MRB				
11	86	eNtrench Urea	Fall	Deep MRB				
6	86	DMPSA Urea	Fall	Shallow MRB				
10	86	DMPSA Urea	Fall	Deep MRB				
8	86	DMPSA/AgroT Urea	Fall	Shallow MRB				
12	86	Urea	Spring	Surface Broadcast				
14	86	Urea	Spring	Shallow MRB				
20	86	Urea	Spring	Deep MRB				
13	86	SuperU	Spring	Surface Broadcast				
16	86	SuperU	Spring	Shallow MRB				
15	86	70%ESN:30%Urea	Spring	Shallow MRB				
18	86	eNtrench Urea	Spring	Shallow MRB				
22	86	eNtrench Urea	Spring	Deep MRB				
17	86	DMPSA Urea	Spring	Shallow MRB				
21	86	DMPSA Urea	Spring	Deep MRB				
19	86	DMPSA/AgroT Urea	Spring	Shallow MRB				
26	52	Urea	Spring	Deep MRB	34	UAN	Rosette	Streamed
23	52	Urea	Spring	Deep MRB	34	UAN/AgroT	Rosette	Streamed
24	52	Urea	Spring	Deep MRB	34	UAN/AgroT Plus	Rosette	Streamed
25	52	70%ESN:30%Urea	Spring	Shallow MRB	34	UAN	Rosette	Streamed

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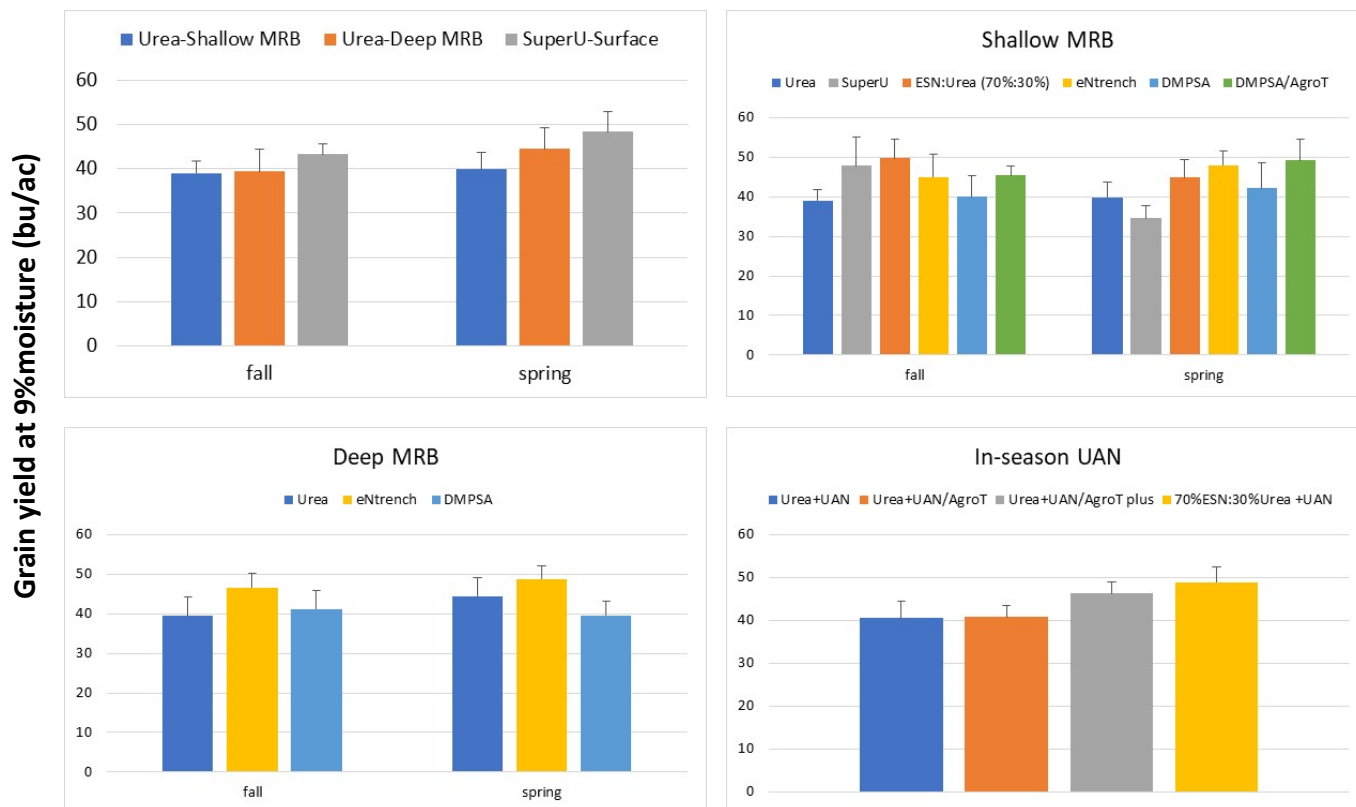
Table 1b. Fertilizer treatments in Cropping Year 1 according to 4R practices (rate, source, time, placement) for 0.7X recommended N application rate.

Trt #	rate (lbs N/ha)	At plant			In-season N top dressing			
		Source	Time	Placement	rate (lbs N/ha)	Source	Time	Placement
28	0							
27	86	Urea	Spring	Shallow MRB				
1	60	Urea	Fall	Surface Broadcast				
3	60	Urea	Fall	Shallow MRB				
9	60	Urea	Fall	Deep MRB				
2	60	SuperU	Fall	Surface Broadcast				
5	60	SuperU	Fall	Shallow MRB				
4	60	70%ESN:30%Urea	Fall	Shallow MRB				
7	60	eNtrench Urea	Fall	Shallow MRB				
11	60	eNtrench Urea	Fall	Deep MRB				
6	60	DMPSA Urea	Fall	Shallow MRB				
10	60	DMPSA Urea	Fall	Deep MRB				
8	60	DMPSA/AgroT Urea	Fall	Shallow MRB				
12	60	Urea	Spring	Surface Broadcast				
14	60	Urea	Spring	Shallow MRB				
20	60	Urea	Spring	Deep MRB				
13	60	SuperU	Spring	Surface Broadcast				
16	60	SuperU	Spring	Shallow MRB				
15	60	70%ESN:30%Urea	Spring	Shallow MRB				
18	60	eNtrench Urea	Spring	Shallow MRB				
22	60	eNtrench Urea	Spring	Deep MRB				
17	60	DMPSA Urea	Spring	Shallow MRB				
21	60	DMPSA Urea	Spring	Deep MRB				
19	60	DMPSA/AgroT Urea	Spring	Shallow MRB				
26	36	Urea	Spring	Deep MRB	24	UAN	Rosette	Streamed
23	36	Urea	Spring	Deep MRB	24	UAN/AgroT	Rosette	Streamed
24	36	Urea	Spring	Deep MRB	24	UAN/AgroT Plus	Rosette	Streamed
25	36	70%ESN:30%Urea	Spring	Shallow MRB	24	UAN	Rosette	Streamed

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Fig. 1. Canola grain yield as affected 4R N treatments at **1.0 × Rec. N rate**.



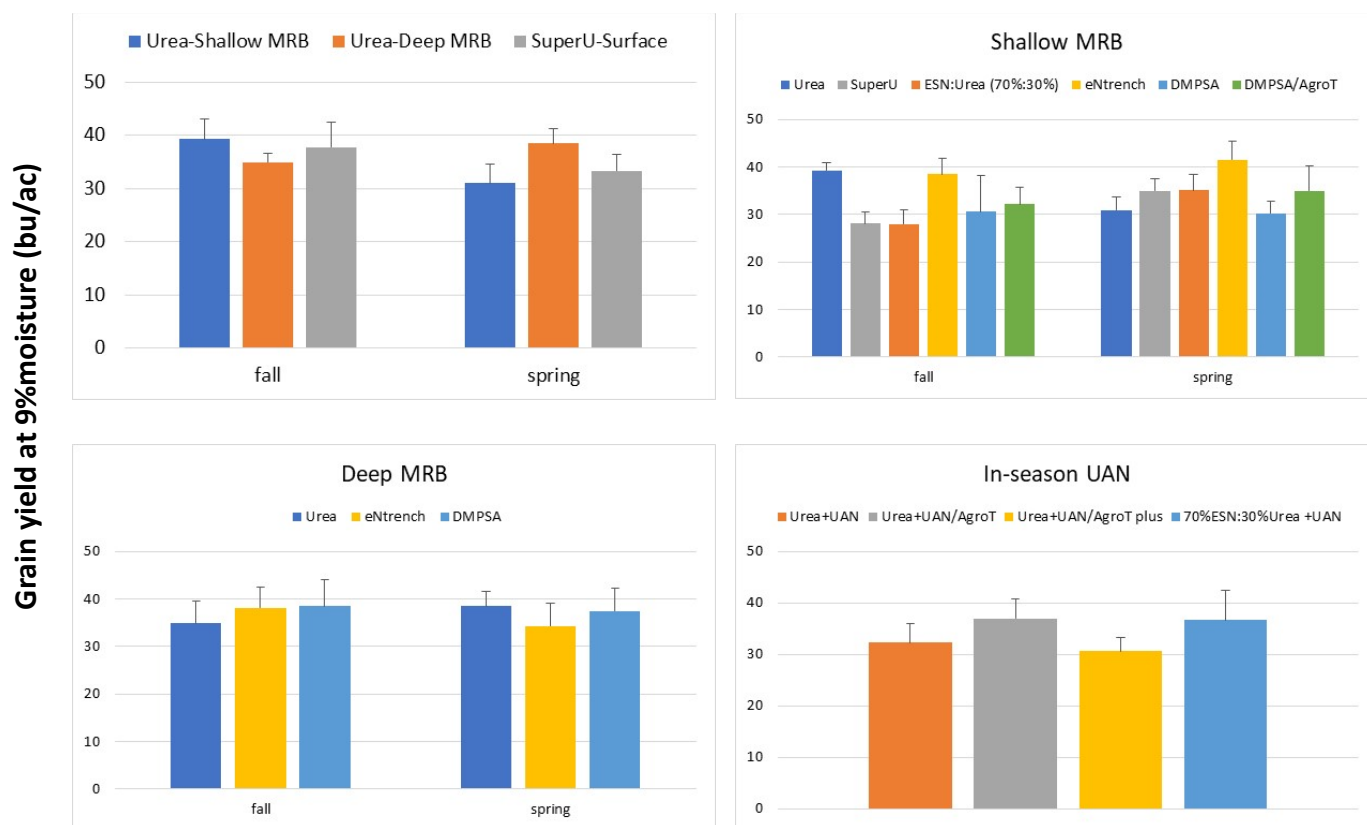
Preliminary findings for **1.0 × Rec. N rate** :

- 1) Mean grain yield across all 1.0×N treatments was 43.4bu/ac, and across all 0.7×N treatments was 34.2 bu/ac, respectively.
- 2) Surface application of SuperU performed better than shallow/deep banding of urea for both fall and spring applications.
- 3) When fertilizers were shallow banded, ESN:Urea blend and SuperU performed better than urea for fall application; DMPSA/AgroT, eNtrench and ESN:Urea blend performed better than urea for spring application.
- 4) The eNtrench treatment performed better than urea alone when being deep banded for both fall and spring applications.
- 5) For in-season UAN application, UAN with AgroT plus performed better than UAN alone. At-plant ESN:Urea blend performed better than urea.
- 6) Across treatments, the mean grain yields were 43.8, 43.2 and 44.2 bu/ac for fall, spring and in-season applications, respectively.

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Fig. 2. Canola grain yield as affected 4R N treatments at $0.7 \times \text{Rec. N rate}$.



Preliminary findings for $0.7 \times \text{Rec. N rate}$:

- 1) Surface application of SuperU had comparable yields as shallow/deep banding urea for fall application, but had a worse performance than deep banding urea for spring application.
- 2) When fertilizers were shallow banded, Urea and eNtrench treatments performed better than other treatments for fall application. The eNtrench treatment also performed better than other treatments for spring application.
- 3) Deep banding of nitrification inhibitors of eNtrench and DMPSA increased grain yield by approximately 10% over urea for fall application. In contrast, deep banding of eNtrench performed worst for spring application.
- 4) For in-season UAN application, UAN with AgroT performed better than UAN alone and UAN with AgroT plus. At-plant ESN:Urea blend performed better than urea.
- 5) Across treatments, the mean grain yields were 34.0, 35.0 and 34.5 bu/ac for fall, spring and in-season applications, respectively.