



MinnesotaCorn

RESEARCH & PROMOTION COUNCIL

INNOVATION GRANT FINAL REPORT

PROJECT TITLE: Conventional & Strip Tillage Nitrogen Management Practices Utilizing Nitrogen Modeling

REPORTING PERIOD: Final Report

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1.) PROJECT ACTIVITIES COMPLETED DURING THE REPORTING PERIOD. *(Describe project progress specific to goals, objectives, and deliverables identified in your project proposal.)*

Harvest data was collected, analyzed and compiled as described in section 2 below.

2.) IDENTIFY ANY SIGNIFICANT FINDINGS AND RESULTS OF THE PROJECT. *(This could include photo documentation of the project at various stages if you haven't already provided these as well as final relevant images of the project at completion. Any data analysis (especially Level 3 Grants), graphics or record of observations throughout the growing season or during the field day event are also anticipated.)*

Table 1: Ask Farm Yield

Program	Average Yield				Side Dress Gallons 32%/Ac				Total N/bu		
	Field Avg	Conventional	Strip Till	Hog Manure	Field Avg	Conventional	Strip Till	Hog Manure	Conventional	Strip Till	Hog Manure
Encirca	256.3	253.3	253.4	257.8	29.761	50.3	51.9	19.7	0.871	0.893	0.872
Adapt-N	255.1	252.2	254.7	256.4	32.970	44.7	36.8	27.4	0.795	0.678	0.984
Delta	1.2	1.1	-1.3	1.3	-3.2	5.6	15.1	-7.8	0.075	0.215	-0.112

Table 2: Ask Farm Analytics

Program	Applied N/bu			Nitrogen \$/Acre			Nitrogen \$/Bushel		
	Conventional	Strip Till	Hog Manure	Conventional	Strip Till	Hog Manure	Conventional	Strip Till	Hog Manure
Encirca	0.752	0.775	0.756	\$ 104.48	\$107.69	\$ 45.07	\$ 0.41	\$ 0.42	\$ 0.17
Adapt-N	0.676	0.561	0.867	\$ 93.54	\$ 78.31	\$ 49.33	\$ 0.37	\$ 0.31	\$ 0.19
Delta	0.076	0.214	-0.111	\$ 10.94	\$ 29.38	\$ (4.26)	\$ 0.04	\$ 0.12	\$ (0.02)

Table 3: Wolle Farm Yield

Program	Average Yield			Side Dress Gallons 32%/Ac			Total N/bu		Applied N/bu	
	Field Avg	Conventional	Strip Till	Field Avg	Conventional	Strip Till	Conventional	Strip Till	Conventional	Strip Till
Encirca	243.8	243.8	-	25.561	25.6	-	0.836	-	0.713	-
Adapt-N	246.9	246.0	248.5	34.182	28.1	44.7	0.865	0.808	0.743	0.687
Delta	-3.1	-2.2	-	-8.6	-2.6	-	-0.030	-	-0.031	-

Table 4: Wolle Farm Analytics

Program	Nitrogen Cost/Acre		Nitrogen Cost/Bushel	
	Conventional	Strip Till	Conventional	Strip Till
Encirca	\$ 111.75	-	\$ 0.46	-
Adapt-N	\$ 116.75	\$110.12	\$ 0.47	\$ 0.44
Delta	\$ (5.00)	-	\$ (0.02)	-

On both fields, multiple tillage methods were utilized. Conventional tillage was fall chisel plow followed by field cultivation in the spring. Strip tillage was and ETS Soil Warrior in the fall, with no spring pass.

While the strip tilled acres showed a slight advantage (.1-2.5bpa) in yield, the biggest benefit we saw was the time saved in the spring not needing a tillage pass. Hog manure proved a yield advantage with reduced fertilizer expense.

Side-dress was carried out by switching between Encirca and Adapt-N prescriptions across both fields. This can be seen in the embedded PDF files below for each farm.



17Ask Sidedress Query.pdf



17Wolle Sidedress Query.pdf

Encirca seemed to more accurately model the manure nitrogen availability resulting in a \$4/acre advantage over Adapt-N acres, while having a \$11-30 acre disadvantage on the conventional and strip-tilled acres at the Ask farm.

At the Wolle farm Encirca acres had a \$5/acre advantage over Adapt-N acres.

Yield data for each farm can be found in the embedded PDF files below:



17Ask Yield Query.pdf



17Wolle Yield Query.pdf

Both nitrogen modeling programs tested thoroughly are extremely valuable for in-season nitrogen applications. Encirca is designed to have more user input and visibility to data analysis than Adapt-N in our experience. If this is not something you are looking for, in our area Adapt-N is a couple dollars per acre cheaper. In the end, both programs work well and are highly recommended with the end decision coming down to availability and support in your local growing area.

3.) CHALLENGES ENCOUNTERED. *(Describe any challenges that you encountered related to project progress specific to goals, objectives, and deliverables identified in the project proposal.)*

It took some research and outreach to identify the best method of analyzing pass by pass data application and harvest data. In the end, I ended up selecting each side-dress and harvest pass separately to retrieve data. These pieces of data were then transferred to an Excel spreadsheet for analysis.

4.) EDUCATION AND OUTREACH ACTIVITIES. *(Describe any opportunities to engage with farmers, influencers or the media about your project.)*

We have shared our findings with several local farmers, participated in a radio interview and shared my project at the MN Ag Expo.

Feedback was given to a MNCGA representative as well as MN Soy representatives to discuss an improved location for the exhibits at MN Ag Expo. The experience was valuable, but could have had a higher impact in my opinion if we were more visible/accessible.

5.) HOW CAN WE HELP? *(Please let us know how we can improve the experience for the next generation of projects.)*

The entire process was well communicated and easy to partner with.

Query	Side Dress N (Gal/Ac)		Yield	Area	Program	Tillage
1	49.12		251.79	6.101	Encirca	Conventional
2	45.07	4.05	252.74	6.059	Adapt-N	Conventional
3	51.84		255.32	4.536	Encirca	Conventional
4	44.2	7.64	251.6	5.39	Adapt-N	Conventional
5	51.93		253.4	4.702	Encirca	Strip Till
6	36.84	15.09	254.71	4.701	Adapt-N	Strip Till
7	19.51		259.58	4.694	Encirca	Hog Manure
8	28.02	-8.51	254.97	4.687	Adapt-N	Hog Manure
9	19.9		254.5	4.687	Encirca	Hog Manure
10	27.44	-7.54	255.2	4.665	Adapt-N	Hog Manure
11	19		254.73	6.016	Encirca	Hog Manure
12	28.31	-9.31	253.38	6.017	Adapt-N	Hog Manure
13	22.45		263.69	6.062	Encirca	Hog Manure
14	27.47	-5.02	258.68	6.081	Adapt-N	Hog Manure
15	19.43		259.45	6.03	Encirca	Hog Manure
16	26.1	-6.67	259.35	6.047	Adapt-N	Hog Manure
17	17.04		253.04	4.465	Encirca	Hog Manure

Tillage	Bushels	Encirca			Adapt-N		
		Acres	Gallons	Bushels	Acres	Gallons	
Conventio	1536.17079	6.101	299.6811	0	0	0	
Conventio	0	0	0	1531.352	6.059	273.07913	
Conventio	1158.13152	4.536	235.1462	0	0	0	
Conventio	0	0	0	1356.124	5.39	238.238	
Strip Till	1191.4868	4.702	244.1749	0	0	0	
Strip Till	0	0	0	1197.392	4.701	173.18484	
Hog Manu	1218.46852	4.694	91.57994	0	0	0	
Hog Manu	0	0	0	1195.044	4.687	131.32974	
Hog Manu	1192.8415	4.687	93.2713	0	0	0	
Hog Manu	0	0	0	1190.508	4.665	128.0076	
Hog Manu	1532.45568	6.016	114.304	0	0	0	
Hog Manu	0	0	0	1524.587	6.017	170.34127	
Hog Manu	1598.48878	6.062	136.0919	0	0	0	
Hog Manu	0	0	0	1573.033	6.081	167.04507	
Hog Manu	1564.4835	6.03	117.1629	0	0	0	
Hog Manu	0	0	0	1568.289	6.047	157.8267	
Hog Manu	1129.8236	4.465	76.0836	0	0	0	
Total	12122.35069	47.293	1407.496	11136.33	43.647	1439.05235	

