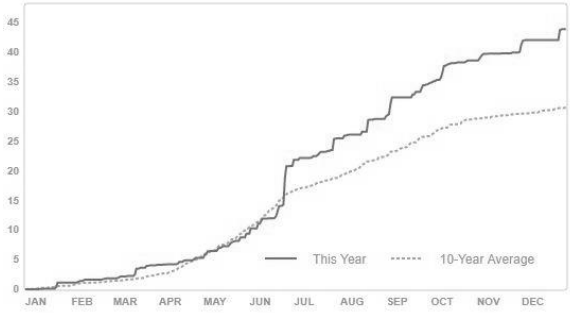
Comparison of In-Furrow Starter Fertilizers on Non-Irrigated Corn

This study was completed by the Maple Creek Creators 4-H Club as part of the Innovative Youth Corn Challenge

Study ID: 0820037201801
County: Colfax
Soil Type: Belfore silty clay loam 0-2% slope; Moody silty clay loam 2-6% slopes
Planting Date: 5/8/18
Harvest Date: 11/19/18
Population: 27,700
Row Spacing (in): 30
Hybrid: Pioneer® P0919AM
Reps: 4
Previous Crop: Soybean
Tillage: No-Till
Seed Treatment: Pioneer® PPST 250, Raxil® fungicide and DuPont Lumivia® insecticide
Herbicide: ***Pre:*** 1.2 qt/ac Harness® Extra, 2.1 oz/ac Balance® Flexx, and 1.03 pt/ac 2,4-D LV4 on 5/17/18 ***Post:*** 1.4 qt/ac Roundup PowerMAX® on 6/15/18
Foliar Insecticides: None
Foliar Fungicides: 10 oz/ac Headline AMP® on 8/7/18
Fertilizer: 154 lb N/ac from 32% UAN applied pre-emerge with pre-herbicide on 5/17/18; 12.5 gal/ac 32% UAN and 3.5 gal/ac 12-0-0-26 providing 49 lb N/ac and 10 lb S/ac on 6/6/18; 0.25 lb/ac Boron, and 0.17 lb/ac Manganese sidedressed on 6/6/18
Irrigation: None
Rainfall (in):



Soil Test (Jan. 2018):

pH	BpH	Soluble Salts	OM	Nitrate	Bray P1	Bray P2	K	Mg	Ca	S	Zn	Mn	Fe	Cu	B	Na
		mS/cm	*(%)*	*ppm*												
6	6.6	0.4	2.9	9	55	73	354	608	2752	24	3.0	8	52	1.4	0.5	44

Introduction: This project was conducted by the Maple Creek Creators 4-H Club as part of the Innovative Youth Corn Challenge. Previously, this club had looked at applying starter fertilizer in-furrow using Triple Nickel. They were concerned about the higher salt content of this starter fertilizer when placed close to the seed. For this year's project, they decided to evaluate another starter fertilizer with lower salt content. Triple Nickel is an inexpensive, but higher salt starter fertilizer. This was compared to Conklin® Feast®, a more expensive but lower salt starter fertilizer. The two products had similar amounts of each nutrient, and zinc was applied with the Conklin® Feast® product so that each treatment would have the same nutrients applied. A no starter fertilizer check was also included. The in-furrow fertilizer was applied at a rate of 5 gal/ac through Keeton seed firmers with a splitter attachment, so the fertilizer is applied to the sidewall and not directly on the seed.

The field had 25 tons/ac of cattle feedlot manure spread and incorporated in the spring of 2017. Soil test levels for phosphorus in January 2018 were 55 ppm Bray P1. Previous on-farm research on starter fertilizer found that the mean yield increase with starter was 12 bu/ac when Bray P1 <10 ppm, 3 bu/ac when Bray P1 was 10-20 ppm, and 1 bu/ac when Bray P1 > 20 ppm (https://go.unl.edu/starter). Studies have also shown

there can be an early growth and yield response from the nitrogen in an N-P starter fertilizer (https://go.unl.edu/starterfert).

Strong winds on June 7 stripped some leaves off plants. On June 24, strong winds and hail again stripped leaves and caused some green snap. On June 25, an all-day rain event resulted in over five inches of rain, which caused some ponding. In response to suspected N loss, N was applied in-season. Gray leaf spot was present in August; therefore, Headline AMP® was aerially applied.

Yield, moisture, and net return were evaluated. Additionally, emergence counts were taken from May 17 to May 30. Counts were taken by flagging plants as they emerged. Counts were taken from all eight rows of the planter.

Results:

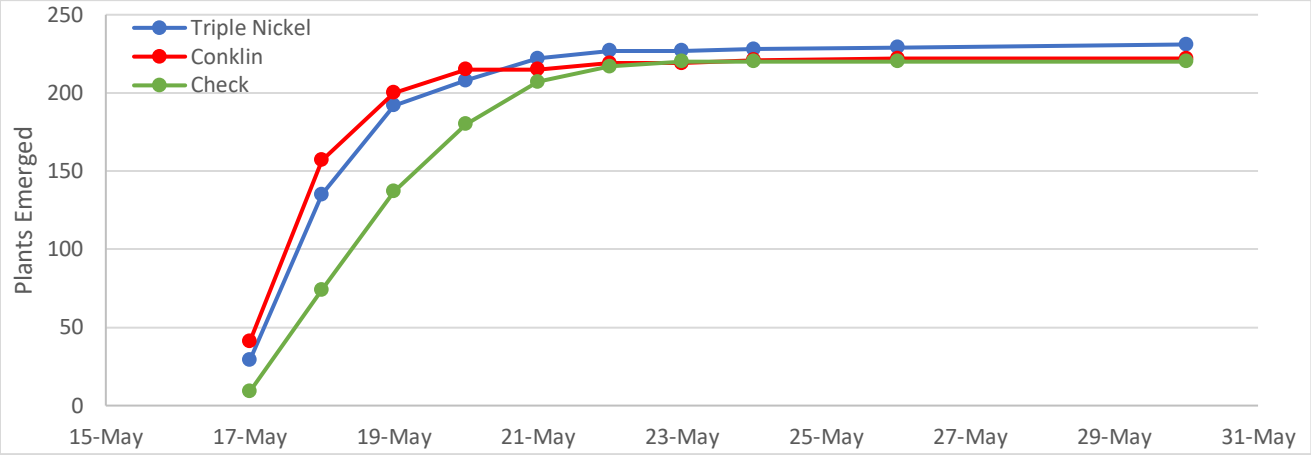


Figure 1. Emergence counts obtained from all eight rows of the planter from May 17 to May 30 for the three treatments.

	Moisture (%)	Yield† (bu/ac)	Marginal Net Return‡ ($/ac)
Check	16.4 A*	234 A	756.96 A
5 gal/ac Triple Nickel 8-20-5-5S-0.5Zn	16.2 A	235 A	747.86 A
5 gal/ac Conklin Feast 8-16-11-2S + 1 pt Zn	16.0 A	233 A	710.62 B
P-Value	0.412	0.362	0.0004

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre adjusted to 15.5% moisture.
‡Marginal net return based on $3.23/bu corn, $11.35/ac for Triple Nickel, $35.05/ac for Conklin Feast, and $5.18/ac for Zinc.

Summary:

- There was no difference in moisture or yield for the treatments evaluated.
- Marginal net return was lower for the Conklin® Feast® product due to the increased production cost.
- Emergence counts are presented graphically in Figure 1. Emergence counts were not replicated; therefore, statistical analysis is not available.
- The impact of green snap on yields and fertilizer response was not documented.

"The Innovative Youth Corn Challenge has been a very valuable and educational experience for our team. We have also learned that an increase in yield doesn't mean an increase in profit, and that in most cases, profit is more important than yield. We have learned it is important to go to the field regularly, because you can find problems and treat them before they become too severe that they harm yield and profitability."

- Maple Creek Creators 4-H Club

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