

RESEARCH FOR RESULTS



QLF Micronutrients Study – Mitchell, South Dakota 2019

OVERVIEW: This trial compares results in corn receiving Zinc micronutrient products from various companies, plus an untreated check.

LOCATION: Mitchell, SD – QLF test facilities

VARIETY: LG5463STXRIB

POPULATION: 34,000

PLANTING DATE: June 4, 2019

CHECK DATE: November 8, 2019

PLOT: 4 Rows (harvest inner two), 47.5', 30" rows, 6 replications, plot 0.011 acre, trial 0.589 acre

SOIL: Silt Loam; 5.2 pH; 14.5 CEC; 4.5% OM

HERBICIDE: Surestart

TREATMENTS: See TABLE 1 (SoilBiotics, Compass, IT, CornSpike)

MOISTURE GRAPH

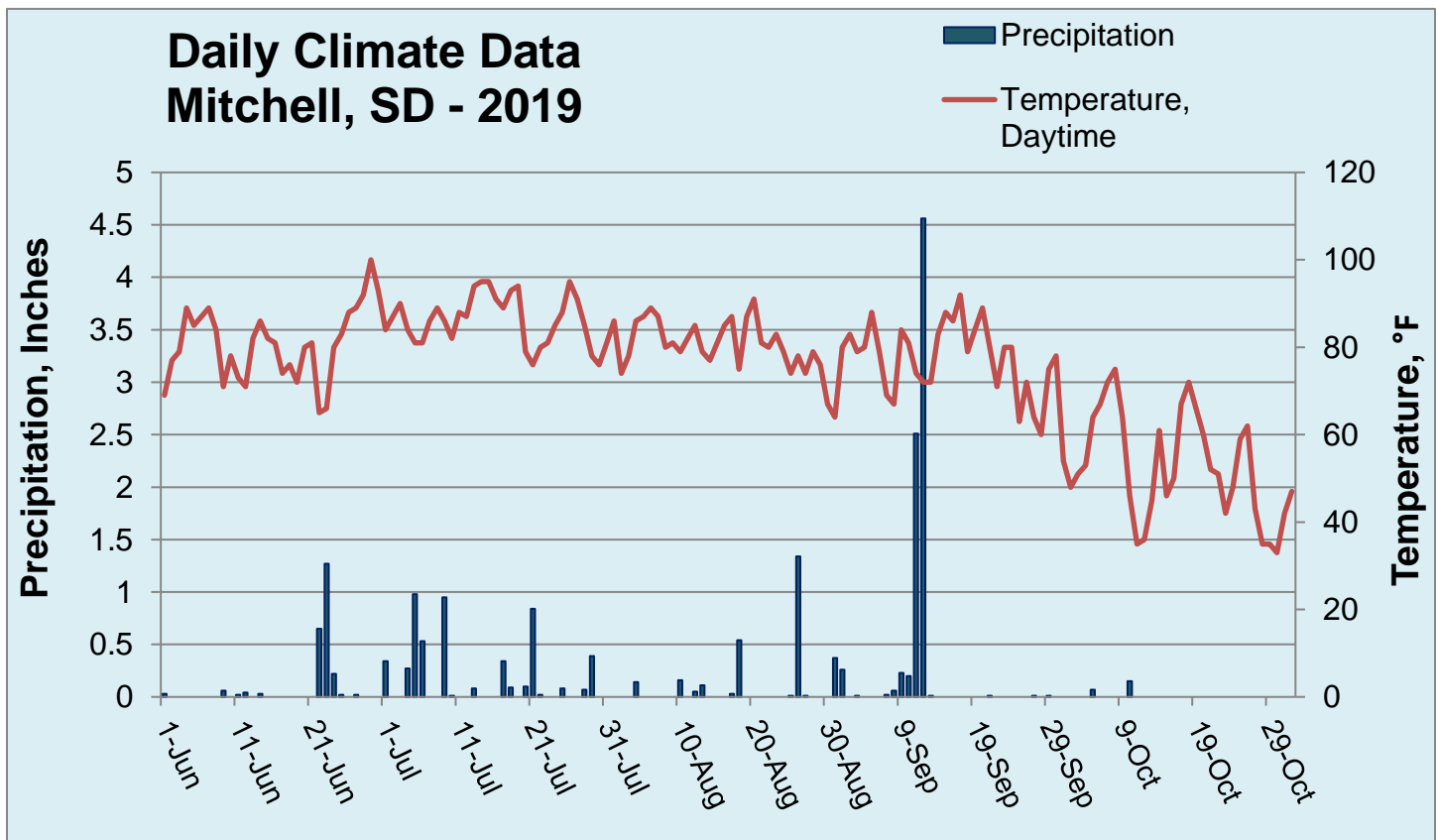


Table 1: Treatments and Rates

No.	Description	Placement	Rate/Unit
1	7-21-3MKP + SoilBiotics Zn, 5% UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre 26 gals/acre
2	7-21-3MKP + SoilBiotics Zn, 5% + Kelpak UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre + 1 qt/acre 26 gals/acre
3	7-21-3MKP + Compass Zn, 5% UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre 26 gals/acre
4	7-21-3MKP + Compass Zn, 5% + Kelpak UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre + 1 qt/acre 26 gals/acre
5	7-21-3MKP + IT 1511 Zn, 5% UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre 26 gals/acre
6	7-21-3MKP + IT 1511 Zn, 5% + Kelpak UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre + 1 qt/acre 26 gals/acre
7	7-21-3MKP + CornSpike UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 qt/acre 26 gals/acre
8	7-21-3MKP + CornSpike + Kelpak UAN 28%	In-Furrow Side-Dress	5 gals/acre + 1 pt/acre + 1 pt/acre 26 gals/acre
9	Check	In-Furrow Side-Dress	Water @ 5 gals/acre UAN 28% @ 26 gals/acre

Table 2: Yield

In-Furrow Corn Micronutrient with 7-21-3MKP		Mitchell, SD	Ranking	Increase
Treatments		Yield (Bu/Ac)	1= Better	Over Check, %
1	SoilBiotics Zn, 5% ¹⁻³	172.0	1	7.7%
2	SoilBiotics Zn, 5% + KelPak ¹⁻⁴	169.8	3	6.5%
3	Compass Minerals Zn, 5% ¹⁻³	169.3	5	6.2%
4	Compass Minerals Zn, 5% + KelPak ¹⁻⁴	169.2	6	6.2%
5	IT 1511 Zn, 5% ¹⁻³	168.0	7	5.5%
6	IT 1511 Zn, 5% + KelPak ¹⁻⁴	166.3	8	4.5%
7	CornSpike ^{1-2 + 5}	170.0	2	6.6%
8	CornSpike + KelPak ^{1-2 + 4-5}	169.6	4	6.4%
9	Check ¹	158.8	9	
LSD at P ≤ 0.10		5.822		

¹ 26 gals of 28% UAN at V6, Side-Dress.

² 5 gals./acre of 7-21-3MKP, In-Furrow, except the Check.

³ 5% Zn treatments, 1 pt./acre.

⁴ KelPak, 1 qtr./acre, except for treatment 8 (KelPak 1 pt./acre)

⁵ CornSpike, 1 qtr./acre, except for treatment 8 (CornSpike 1 pt./acre)

Table 3: Moisture

In-Furrow Corn Micronutrient with 7-21-3MKP		Mitchell, SD	Ranking	Increase
Treatments		Moisture, %	1= Better	Over Check, %
1	SoilBiotics Zn, 5% ¹⁻³	21.4	1	12.0%
2	SoilBiotics Zn, 5% + KelPak ¹⁻⁴	21.6	4	10.9%
3	Compass Minerals Zn, 5% ¹⁻³	21.6	2	11.2%
4	Compass Minerals Zn, 5% + KelPak ¹⁻⁴	22.1	5	8.4%
5	IT 1511 Zn, 5% ¹⁻³	22.2	6	8.1%
6	IT 1511 Zn, 5% + KelPak ¹⁻⁴	23.5	8	2.0%
7	CornSpike ^{1-2 + 5}	21.6	3	11.0%
8	CornSpike + KelPak ^{1-2 + 4-5}	22.7	7	5.6%
9	Check ¹	24.0	9	
LSD at P ≤ 0.10		NS		

¹ 26 gals of 28% UAN at V6, Side-Dress.

² 5 gals./acre of 7-21-3MKP, In-Furrow, except the Check.

³ 5% Zn treatments, 1 pt./acre.

⁴ KelPak, 1 qtr./acre, except for treatment 8 (KelPak 1 pt./acre)

⁵ CornSpike, 1 qtr./acre, except for treatment 8 (CornSpike 1 pt./acre)

Table 4: Test Weight

In-Furrow Corn Micronutrient with 7-21-3MKP			
Treatments	Mitchell, SD	Ranking	Increase
	Test Wt., Lbs	1= Better	Over Check, %
1 SoilBiotics Zn, 5% ¹⁻³	50.3	4	3.1%
2 SoilBiotics Zn, 5% + KelPak ¹⁻⁴	51.7	1	5.7%
3 Compass Minerals Zn, 5% ¹⁻³	50.1	5	2.8%
4 Compass Minerals Zn, 5% + KelPak ¹⁻⁴	49.4	8	1.3%
5 IT 1511 Zn, 5% ¹⁻³	50.6	2	3.6%
6 IT 1511 Zn, 5% + KelPak ¹⁻⁴	50.4	3	3.4%
7 CornSpike ^{1-2 + 5}	49.5	7	1.6%
8 CornSpike + KelPak ^{1-2 + 4-5}	49.7	6	1.9%
9 Check ¹	48.7	9	
LSD at P ≤ 0.10	NS		

¹ 26 gals of 28% UAN at V6, Side-Dress.

² 5 gals./acre of 7-21-3MKP, In-Furrow, except the Check.

³ 5% Zn treatments, 1 pt./acre.

⁴ KelPak, 1 qtr./acre, except for treatment 8 (KelPak 1 pt./acre)

⁵ CornSpike, 1 qtr./acre, except for treatment 8 (CornSpike 1 pt./acre)

Table 5: Plot Weight

In-Furrow Corn Micronutrient with 7-21-3MKP			
Treatments	Mitchell, SD	Ranking	Increase
	Plot Wt., Lbs	1= Better	Over Check, %
1 SoilBiotics Zn, 5% ¹⁻³	56.5	2	4.5%
2 SoilBiotics Zn, 5% + KelPak ¹⁻⁴	55.9	5	3.6%
3 Compass Minerals Zn, 5% ¹⁻³	55.7	7	3.2%
4 Compass Minerals Zn, 5% + KelPak ¹⁻⁴	56.1	4	3.9%
5 IT 1511 Zn, 5% ¹⁻³	55.7	8	3.2%
6 IT 1511 Zn, 5% + KelPak ¹⁻⁴	56.1	3	4.0%
7 CornSpike ^{1-2 + 5}	56.8	1	5.0%
8 CornSpike + KelPak ^{1-2 + 4-5}	55.8	6	3.5%
9 Check ¹	53.9	9	
LSD at P ≤ 0.10	1.621		

¹ 26 gals of 28% UAN at V6, Side-Dress.

² 5 gals./acre of 7-21-3MKP, In-Furrow, except the Check.

³ 5% Zn treatments, 1 pt./acre.

⁴ KelPak, 1 qtr./acre, except for treatment 8 (KelPak 1 pt./acre)

⁵ CornSpike, 1 qtr./acre, except for treatment 8 (CornSpike 1 pt./acre)

Table 6: ROI**In-Furrow Corn Micronutrient with 7-21-3MKP**

Treatments	Mitchell, SD ROI ⁶	Ranking 1= Better	Increase Over Check, %
SoilBiotics Zn, 5% ¹⁻³	\$566.73	1	4.3%
SoilBiotics Zn, 5% + KelPak ¹⁻⁴	\$549.03	5	1.2%
Compass Minerals Zn, 5% ¹⁻³	\$557.14	3	2.6%
Compass Minerals Zn, 5% + KelPak ¹⁻⁴	\$546.84	7	0.8%
IT 1511 Zn, 5% ¹⁻³	\$548.89	6	1.2%
IT 1511 Zn, 5% + KelPak ¹⁻⁴	\$532.94	9	-1.8%
CornSpike ^{1-2 + 5}	\$557.33	2	2.7%
CornSpike + KelPak ^{1-2 + 4-5}	\$553.47	4	2.0%
Check ¹	\$542.44	8	

LSD at P ≤ 0.10

¹ 26 gals of 28% UAN at V6, Side-Dress.² 5 gals./acre of 7-21-3MKP, In-Furrow, except the Check.³ 5% Zn treatments, 1 pt./acre.⁴ KelPak, 1 qtr./acre, except for treatment 8 (KelPak 1 pt./acre)⁵ CornSpike, 1 qtr./acre, except for treatment 8 (CornSpike 1 pt./acre)⁶ Based on In-Furrow and Side-Dress fertilizer cost only and Corn at \$3.65.**SUMMARY**

The micronutrient trial was established to verify two responses:

- If Zn at 5% will have a positive effect on yield.
 - If KelPak will have a synergetic effect when Zn is added to the fertilizer program. Four companies were evaluated based on their Zn sources with and without KelPak.
1. A significant difference was observed in yield. SoilBiotics (without KelPak) led the way by demonstrating a +13.2 bushel per acre increase over the control.
 2. SoilBiotics (without KelPak) was first in demonstrating a significant difference in moisture content at +12% over the control.
 3. SoilBiotics (with KelPak) was first in demonstrating a significant difference in test weight at +5.7% over the control.
 4. SoilBiotics (without KelPak) was second in demonstrating a significant difference in overall plot weight at +4.5%.
 5. SoilBiotics returned the top ROI at +\$24/acre over the control and +\$9.40/acre over the nearest competitor.