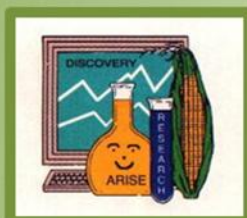




Field Plot Evaluation for SumaGrow on Corn.

12-BSE0212-12

Work Conducted By:



Arise Research & Discovery, Inc.

3998 E. Snake Trail Road - Martinsville, Illinois 62442
Phone: 217-382-4850 Fax: 217-382-4853 E-mail: arise@fairpoint.net



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PROJECT PROTOCOL

Project Proposal Code: 12-BSE0212-12

Date: June 26, 2012

Simplified Title: Field Plot Evaluation for SumaGrow on Corn.

Company: Bio Soil Enhancers, Inc
1161 James Street,
Hattiesburg, MS 39401

Contact: Wayne Wade (corporate contact)
Dr.Lalitha (research contact)

Tel: 601-582-4000
Fax: 1-866-888-2744

Cell: 601-310-9051

E-Mail: wayne.wade@sumagrow.com

Justification: Bio Soil Enhancers, Inc .is in need of data and discovery about plant growth maturity stages and grain and stalk composition information where SumaGrow is used in growing corn.

Objectives: Using field plots compare two rates of SumaGrow vs. a control of standard agronomic practices for growing corn.

Also, obtain maturity information, and grain and stalk analysis to compare to standard growing procedures.

Location: Arise Research & Discovery, Inc.; Martinsville, IL.

Crop (Variety): **GMO Corn** following soybeans from 2011

Plot Design: **Type:** RCBD **No. Reps:** 4 **No. Field Plots:** 12

Plot Size: 10' x 30'

No of Rows: 4

Row Spacing: 30 inches

Critical: Field and laboratory analysis.

1. Grain Yield, Moisture, Test Weight, Gross Dollar Value
2. Preplant and Post Harvest soil Test for Available Nutrients
3. Preplant and Post Harvest soil Test for Nutrient Reserves
4. Germination (% germinated and days to germinate).
5. Crop Growth Stage (Date to Tassel and Date to Black Layer)
6. Sugar Brix Stalk Test
7. Root Mass with PHOTOS
8. Send Stalk Samples to POET at Harvest
9. Grain Analysis Complete Proximate with Minerals

Study Length: One Year

Treatments:

1. SumaGrow at Full Rate plus (1/2 rate NPK)

200 Lb/ac DAP and 200 Lb/ac 0-0-60
80 Lbs N/ac UAN preplant Incorporated
Mulch Till
Plant Corn 30,000 seed/ac

Immediately after planting apply SumaGrow in 6" band over row at 1.0 gallon per acre (26 ml ounces per plot which is equal to 1 gallon per acre) mixed in 20 gallons/ac water (dilution ratio 20 parts water to 1 part SumaGrow) **You also need to shake or agitate well prior to application to ensure a thorough mixing.**

Also, at knee high, spray SumaGrow on soil at ½ gallon per acre diluted with 10 gal water per acre. (13 ml SumaGrow per plot). **During application, make sure that the soil under and around the soybeans is saturated.**

2. SumaGrow at Heavier Rate plus (1/2 rate NPK)

200 Lb/ac DAP and 200 Lb/ac 0-0-60
80 Lbs N/ac UAN preplant incorporated
Mulch Till
Plant Corn 30,000 seeds/ac

Immediately after planting apply SumaGrow in 6" band over row at 1.0 gallon per acre (0.26 ml per plot which is equal to 1.0 gallon per acre) mixed in 20 gallons/ac water (dilution ratio 20 parts water to 1 part SumaGrow)

Also, at knee high, spray SumaGrow on soil at 1.0 gallon per acre diluted with 20 gal water per acre. (26 ml SumaGrow per plot).

3. Control (Normal Rate of NPK for area)

300 Lb/ac DAP and 300 Lb/ac 0-0-60
160 Lbs N/ac UAN preplant incorporated
Mulch Till
Plant corn 30,000 seeds/ac

Data Collection:

1. Grain Yield, Moisture, Test Weight, Gross Dollar Value
2. Preplant Soil Test for Available Nutrients (Int'l Ag Labs) and Reserve Nutrients (Logan Labs)
3. Soil Test 5DAH for Available Nutrients (Int'l Ag Labs) and Reserve Nutrients (Logan Labs)
4. Germination (% germinated and days to emergence).
5. Sugar Brix Test 60 DAP
6. Root Mass 15 DAP and at Tassel with PHOTOS
7. Check Days to Tassel and to Black Layer
8. At Harvest send stalk Samples to POET (check for Sugar and Cellulose)
8. Grain Analysis Complete Proximate with Minerals



Field Plot Evaluation for SumaGrow on Corn.

12-BSE0212-12

Site Description

Arise Research & Discovery, Inc.

Field Plot Evaluation for SumaGrow on Corn.

Trial ID:	12-BSE0212-12	Study Dir.:	Dr.Lalitha
Location:	Martinsville	Investigator:	Dr. Roy M Stephen

GENERAL TRIAL INFORMATION

Title: Research Director
Affiliation: Bio Soil Enhancers, Inc 1161 James Street, Hattiesburg, MS
Postal Code: 39401
Investigator: Roy M Stephen **Title:** President/CEO
Affiliation: Arise research and Discovery, Inc.
Postal Code: 62442

TRIAL LOCATION

City: Martinsville,	Trial Status: Ongoing
State/Prov.: IL	Trial Reliability: Excellent
Postal Code: 62442	Initiation Date: 5/3/2012
Country: USA	Planned Completion Date: 12/30/2012
E-Longitude of LL Corner °: 87.940367	N-Latitude of LL Corner °: 39.352442
Unit: 1	

Directions: Exit I-70 at #136, go South to Stop Sign. Turn right on IL Rt 40 West. Drive 2 miles to Snake Trail Road. Turn Right (North) Follow Road 2 miles to Arise Research Station on Left (South) side of road.

COOPERATOR/LANDOWNER

Cooperator: Arise Research & Discovery, Inc.	Country: USA
	Phone No: (217)382-4850
Address 1: 3998 E. Snake Trail Road	Fax No: (217)382-4853
City: Martinsville,	
State/Prov: IL	
Postal Code: 62442	

Conducted Under GLP (Y/N): N **Conducted Under GEP (Y/N):** Y
Guidelines: Protocol **Guideline Description:** To Protocol

Crop 1: ZEAMX	CORN, FIELD	Variety: Dekalb 63-64 RR
Planting Date: 7/12/2012	Planting Method: Row Plot Planter	
Rate: 30000 S/A	Depth: 1.5 IN	
Row Spacing: 30 IN	Seed Bed: Moderate	
Soil Temperature: 88 F	Soil Moisture: Dry	Emergence Date: 7/19/2012

SITE AND DESIGN

Plot Width, Unit: 10 FT **Plot Length, Unit:** 30 FT **Reps:** 4
Site Type: Field Laboratory
Tillage Type: Minimum **Study Design:** RANDOMIZED COMPLETE BLOCK

Trial Initiation Comments: Soil Condition are very dry. Ambient temperatures day and night record setting. Passive irrigation started immediately.

	Previous Crops	Previous Pesticides	Year
1.	Soybeans	Prowl/Glyphosate Labeld Rates	2011

Arise Research & Discovery, Inc.

MAINTENANCE

Field Prep./Maintenance: Fall fertilized, disked, spring tilled for weed control and leveling, rototill and plant.

No.	Date	Treatment Name	Form Conc	Form Unit	Form Type	Rate	Rate Unit
1.	10/5/2011	Potash	60	%	G	200	Lb/A
2.	10/5/2011	(11)-52-0	11	%	G	200	Lb/A
3.	10/5/2011	11-(52)-0	52	%	G	200	Lb/A
4.	10/5/2011	Micro Mix	30	%	G	100	Lb/A
5.	10/5/2011	Pelleted Calcium	38	%	G	200	Lb/A

SOIL DESCRIPTION

% Sand: 5 % OM: 1.7 Texture: Silty Clay Loam
 % Silt: 50 pH: 6.3 Soil Name: Piasa
 % Clay: 45 CEC: 9 Fert. Level: Moderate

MOISTURE CONDITIONS

	Date	Amount	Unit	Type
1.	4/1/2012	0.02	IN	Rain
2.	4/4/2012	0.44	IN	Rain
3.	4/5/2012	0.76	IN	Rain
4.	4/13/2012	0.03	IN	Rain
5.	4/14/2012	1.85	IN	Rain
6.	4/15/2012	0.28	IN	Rain
7.	4/16/2012	0.12	IN	Rain
8.	4/28/2012	0.74	IN	Rain
9.	4/29/2012	0.93	IN	Rain
10.	4/30/2012	0.11	IN	Rain
11.	5/1/2012	0.31	IN	Rain
12.	5/4/2012	0.09	IN	Rain
13.	5/17/2012	0.01	IN	Rain
14.	5/20/2012	0.3	IN	Rain
15.	5/29/2012	0.07	IN	Rain
16.	5/31/2012	0.62	IN	Rain
17.	6/1/2012	0.02	IN	Rain
18.	6/4/2012	0.08	IN	Rain
19.	6/11/2012	0.13	IN	Rain
20.	7/1/2012	0.2	IN	Rain
21.	7/8/2012	0.2	IN	Rain
22.	8/2/2012	0.2	IN	Rain
23.	8/9/2012	0.6	IN	Rain
24.	8/13/2012	0.24	IN	Rain
25.	8/16/2012	1.8	IN	Rain
25.	8/21/2012	0.2	IN	Rain
27.	8/27/2012	0.9	IN	Rain
28.	8/31/2012	0.2	IN	Rain
29.	9/1/2012	1.22	IN	Rain , Thunderstorm
30.	9/2/2012	0.59	IN	Rain
31.	9/4/2012	0.94	IN	Fog , Rain , Thunderstorm
32.	9/5/2012	0.71	IN	Rain , Thunderstorm
33.	9/7/2012	2.6	IN	Rain
34.	9/14/2012	0.43	IN	Rain
36.	9/17/2012	0.1	IN	Rain

Overall Moisture Conditions: Irrigation Applied No rainfall June 1- August 9th
Closest Weather Station: On Site **Distance:** 200 **Unit:**

Ft

Arise Research & Discovery, Inc.

Field Plot Evaluation for SumaGrow on Corn.

Trial ID: 12-BSE0212-12

Study Dir.:

Dr.Lalitha

Location: Martinsville

Investigator:

Dr. Roy M Stephen

Trt No.	Treatment Name	Rate	Rate Unit	Grow Stg	Appl Code
1	0-0-60	200	LB/A	Fall	A
	11-52-0	200	LB/A	Fall	A
	Pelleted Calcium	300	LB/A	Fall	A
	Micro Mix	100	LB/A	Fall	A
	UAN	27	GAL/A		C
	SumaGro	1	GAL/A	Plant	D
	SumaGro	0.5	GAL/A	Side	E
2	0-0-60	200	LB/A	Fall	A
	11-52-0	200	LB/A	Fall	A
	Pelleted Calcium	300	LB/A	Fall	A
	Micro Mix	100	LB/A	Fall	A
	UAN	27	GAL/A	Preplant	C
	SumaGro	1	GAL/A	Plant	D
	SumaGro	1	GAL/A	Side	E
3	0-0-60	200	LB/A	Fall	A
	11-52-0	200	LB/A	Fall	A
	18-46-0	100	LB/A	Preplant	B
	Pelleted Calcium	300	LB/A	Fall	A
	Micro Mix	100	LB/A	Fall	A
	UAN	54	GAL/A	Preplant	C

Replications: 4, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomized Complete Block (RCB), Treatment units: US standard, Treated 'Plot' experimental unit size Width: 10 feet, Treated 'Plot' experimental unit size Length: 30 feet, Format definitions: G-Herb99.def, G-Herb99.frm

Arise Research & Discovery, Inc.

APPLICATION DESCRIPTION

	A	B	C	D	E
Application Date:	10/5/2011	6/29/2012	6/29/2012	7/12/2012	8/3/2012
Time of Day:	PM	PM	PM	PM	PM
Application Method:	Broadcast	Broadcast	Inject	Spray	Spray
Application Timing:	Fall	Preplant	Preplant	Plant	V6-V8
Applic. Placement:	Soil	Soil	Soil	Row Top	Soil
Air Temp., Unit:	76 F	101 F	101 F	93 F	90 F
% Relative Humidity:	41	45	45	56	72
Wind Velocity, Unit:	6 MPH	7 MPH	7 MPH	11 MPH	6 MPH
Dew Presence (Y/N):	N	N	N	N	N
Water Hardness:				23 Grains	23 Grains
Soil Temp., Unit:	67 F	86 F	86 F	88 F	88 F
Soil Moisture:	Dry	Dry	Dry	Dry	Dry
% Cloud Cover:	5	5	5	5	5

APPLICATION EQUIPMENT

	A	B	C	D	E
Appl. Equipment:	Spreader	Spreader	Tool Bar	Sprayer	Sprayer
Operating Pressure:	PTO	PTO	7 LB	15 LB	15 LB
Nozzle Type:	Gate	Gate	Tube	EFF	EFF
Nozzle Size:	1 IN	1 IN	1/16	8002	8002
Nozzle Spacing, Unit:	10 FT	10 FT	30 IN	20 IN	20 IN
Nozzles/Row:	1	1	1	1	1
Band Width, Unit:	10 FT	10 FT	1 IN	20 IN	20 IN
Boom Length, Unit:	10 FT	10 FT	10 FT	10 FT	10 FT
Boom Height, Unit:	30 IN	30 IN		30 IN	30 IN
Ground Speed, Unit:	4 MPH	4 MPH	3 MPH	2 MPH	2 MPH
Incorporation Equip.:	Disk	Disk	Coulter		
Incorp. Depth, Unit:	4 IN	4 IN	6 IN		
Tank Mix (Y/N):	Y	Y	N	N	N

Trt No	Treatment Application Comment
1	Quality assurance review. Adjustment made on P&K at 1/2 rate. Only N will be at 1/2 rate. Spray nozzle modified for a 6 inch band.
	Calibrations made for rate structure. Suma Grow to be agitated aggressively for mixing, Notes and observations calendar made.
2	Quality assurance review. Adjustment made on P&K at 1/2 rate. Only N will be at 1/2 rate. Spray nozzle modified for a 6 inch band.
	Calibrations made for rate structure. Suma Grow to be agitated aggressively for mixing, Notes and observations calendar made.
3	Quality assurance review. Adjustment made on P&K at 1/2 rate. Only N will be at 1/2 rate. Spray nozzle modified for a 6 inch band.
	Calibrations made for rate structure. Notes and observation calendar made.



Field Plot Evaluation for SumaGrow on Corn.

12-BSE0212-12

Data Summary

Arise Research & Discovery, Inc.

Field Plot Evaluation for SumaGrow on Corn.

Trial ID: 12-BSE0212-12

Study Dir.:

Dr.Lalitha

Location: Martinsville

Investigator:

Dr. Roy M Stephen

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Grain Yield Bu/ac 10/16/2012 R3	ZEAMX Stalks Plant Pop no./ac 8/1/2012 V-3	ZEAMX Grain Moisture % 10/16/2012 Harvest	ZEAMX Grain Dry Matt % 10/16/2012 Harvest	ZEAMX Grain Nitrogen % 10/16/2012 Harvest	ZEAMX Grain Crude Protein % 10/16/2012 Harvest
Trt Treatment No. Name	Rate RateUnit	Appl Code	Plot						
1 0-0-60	200LB/A	A	101	67	27750	78.97	21.03	1.77	11.06
11-52-0	200LB/A	A	202	94	23500	71.51	28.49	1.58	9.88
Pelleted Calcium	300LB/A	A	303	83	29500	72.76	27.24	1.55	9.69
Micro Mix UAN	100LB/A	A	401	91	29000	66.17	33.83	1.39	8.69
SumaGro	27GAL/A	C							
SumaGro	1GAL/A	D							
SumaGro	0.5GAL/A	E							
Mean =				84	27438	72.35	27.65	1.57	9.83
2 0-0-60	200LB/A	A	103	108	26500	67.22	32.78	1.40	8.75
11-52-0	200LB/A	A	201	95	27500	72.69	27.31	1.46	9.13
Pelleted Calcium	300LB/A	A	302	86	28250	69.68	30.32	1.41	8.81
Micro Mix UAN	100LB/A	A	403	66	26250	72.15	27.85	1.51	9.44
SumaGro	27GAL/A	C							
SumaGro	1GAL/A	D							
SumaGro	1GAL/A	E							
Mean =				89	27125	70.44	29.57	1.45	9.03
3 0-0-60	200LB/A	A	102	76	26750	75.65	24.35	1.51	9.44
11-52-0	200LB/A	A	203	85	26500	71.13	28.87	1.53	9.56
18-46-0	100LB/A	B	301	74	29500	70.47	29.53	1.52	9.50
Pelleted Calcium	300LB/A	A	402	91	27250	73.20	26.80	1.52	9.50
Micro Mix UAN	100LB/A	A							
SumaGro	54GAL/A	C							
Mean =				82	27500	72.61	27.39	1.52	9.50

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Grain Calcium %	ZEAMX Grain Potassium %	ZEAMX Grain Magnesium %	ZEAMX Grain Sodium %	ZEAMX Grain Phosphorus %
				10/16/2012 Harvest	10/16/2012 Harvest	10/16/2012 Harvest	10/16/2012 Harvest	10/16/2012 Harvest
Trt	Treatment	Rate	Appl					
No.	Name	Rate	Unit Code Plot					
1	0-0-60	200LB/A	A 101	0.16	1.46	0.14	0.01	0.33
	11-52-0	200LB/A	A 202	0.08	1.26	0.15	0.01	0.39
	Pelleted	300LB/A	A 303	0.21	1.24	0.15	0.01	0.35
	Calcium	100LB/A	A 401	0.12	1.12	0.15	0.01	0.37
	Micro Mix	27GAL/A	C					
	UAN	1GAL/A	D					
	SumaGro	0.5GAL/A	E					
			Mean =	0.14	1.27	0.15	0.01	0.36
2	0-0-60	200LB/A	A 103	0.17	1.10	0.15	0.01	0.36
	11-52-0	200LB/A	A 201	0.08	1.27	0.17	0.01	0.41
	Pelleted	300LB/A	A 302	0.01	1.31	0.17	0.01	0.41
	Calcium	100LB/A	A 403	0.05	1.27	0.15	0.01	0.38
	Micro Mix	27GAL/A	C					
	UAN	1GAL/A	D					
	SumaGro	1GAL/A	E					
			Mean =	0.08	1.24	0.16	0.01	0.39
3	0-0-60	200LB/A	A 102	0.01	1.26	0.14	0.01	0.35
	11-52-0	200LB/A	A 203	0.13	1.29	0.16	0.01	0.40
	18-46-0	100LB/A	B 301	0.07	1.19	0.17	0.01	0.41
	Pelleted	300LB/A	A 402	0.01	1.30	0.18	0.01	0.42
	Calcium	100LB/A	A					
	Micro Mix	54GAL/A	C					
	UAN							
			Mean =	0.06	1.26	0.16	0.01	0.40

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Grain Sulfur %	ZEAMX Grain Aluminum ppm	ZEAMX Grain Boron ppm	ZEAMX Grain Copper ppm	ZEAMX Grain Iron ppm
				10/16/2012 Harvest	10/16/2012 Harvest	10/16/2012 Harvest	10/16/2012 Harvest	10/16/2012 Harvest
Trt	Treatment	Rate	Appl					
No.	Name	Rate Unit	Code Plot					
1	0-0-60	200LB/A	A 101	0.15	50	8	6	48
	11-52-0	200LB/A	A 202	0.13	53	6	5	38
	Pelleted	300LB/A	A 303	0.13	37	7	5	43
	Calcium	100LB/A	A 401	0.12	50	7	4	39
	Micro Mix	27GAL/A	C					
	UAN	1GAL/A	D					
	SumaGro	0.5GAL/A	E					
			Mean =	0.13	48	7	5	42
2	0-0-60	200LB/A	A 103	0.12	29	5	5	39
	11-52-0	200LB/A	A 201	0.13	1	8	4	45
	Pelleted	300LB/A	A 302	0.12	17	6	4	42
	Calcium	100LB/A	A 403	0.13	84	5	3	40
	Micro Mix	27GAL/A	C					
	UAN	1GAL/A	D					
	SumaGro	1GAL/A	E					
			Mean =	0.13	33	6	4	42
3	0-0-60	200LB/A	A 102	0.13	1	5	5	43
	11-52-0	200LB/A	A 203	0.13	10	7	5	45
	18-46-0	100LB/A	B 301	0.13	14	6	3	49
	Pelleted	300LB/A	A 402	0.14	45	6	4	45
	Calcium	100LB/A	A					
	Micro Mix	54GAL/A	C					
	UAN							
			Mean =	0.13	18	6	4	46

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage					ZEAMX Grain Manganese ppm 10/16/2012 Harvest	ZEAMX Grain Zinc ppm 10/16/2012 Harvest	ZEAMX Ear Leaf Brix % 9/14/2012	ZEAMX Ear Leaf Chlorophyll % 9/14/2012	ZEAMX Soil Humus Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Nitrates Lb/Acre 6/27/2012 Preplant
Trt	Treatment	Rate	Appl	Plot						
No.	Name	Rate	Unit							
1	0-0-60	200LB/A	A	101	30	48	6.50	50.5	6	20
	11-52-0	200LB/A	A	202	21	33	6.87	57.5	20	30
	Pelleted Calcium	300LB/A	A	303	18	41	5.97	57.4	4	25
	Micro Mix	100LB/A	A	401	23	41	8.63	58.7	4	30
	UAN	27GAL/A	C							
	SumaGro	1GAL/A	D							
	SumaGro	0.5GAL/A	E							
	Mean =				23	41	6.99	56.0	9	26
2	0-0-60	200LB/A	A	103	18	37	6.60	57.4	4	10
	11-52-0	200LB/A	A	201	21	38	5.17	56.4	20	30
	Pelleted Calcium	300LB/A	A	302	17	41	6.93	56.3	4	30
	Micro Mix	100LB/A	A	403	17	39	8.00	54.7	4	25
	UAN	27GAL/A	C							
	SumaGro	1GAL/A	D							
	SumaGro	1GAL/A	E							
	Mean =				18	39	6.68	56.2	8	24
3	0-0-60	200LB/A	A	102	22	37	8.90	56.1	5	25
	11-52-0	200LB/A	A	203	21	40	7.50	57.1	3	8
	18-46-0	100LB/A	B	301	17	48	7.13	55.8	5	30
	Pelleted Calcium	300LB/A	A	402	21	48	5.57	57.2	5	60
	Micro Mix	100LB/A	A							
	UAN	54GAL/A	C							
	Mean =				20	43	7.28	56.6	5	31

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil Ammonia Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Phosphor Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Potassium Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Calcium Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Magnesium Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Sodium ppm 6/27/2012 Preplant
Trt	Treatment	Rate	Appl						
No.	Name	Rate Unit	Code Plot						
1	0-0-60	200LB/A	A 101	4	7	122	1086	84	4
	11-52-0	200LB/A	A 202	4	14	151	1049	75	4
	Pelleted								
	Calcium	300LB/A	A 303	2	5	176	969	71	4
	Micro Mix	100LB/A	A 401	2	2	162	1026	79	4
	UAN	27GAL/A	C						
	SumaGro	1GAL/A	D						
	SumaGro	0.5GAL/A	E						
			Mean =	3	7	153	1033	77	4
2	0-0-60	200LB/A	A 103	4	2	132	1111	81	4
	11-52-0	200LB/A	A 201	2	10	166	1218	90	2
	Pelleted								
	Calcium	300LB/A	A 302	2	5	172	963	72	4
	Micro Mix	100LB/A	A 403	2	4	180	1050	84	6
	UAN	27GAL/A	C						
	SumaGro	1GAL/A	D						
	SumaGro	1GAL/A	E						
			Mean =	3	5	163	1086	82	4
3	0-0-60	200LB/A	A 102	6	3	164	1046	73	4
	11-52-0	200LB/A	A 203	6	3	165	1134	80	4
	18-46-0	100LB/A	B 301	2	6	156	993	73	6
	Pelleted								
	Calcium	300LB/A	A 402	6	33	201	952	72	10
	Micro Mix	100LB/A	A						
	UAN	54GAL/A	C						
			Mean =	5	11	172	1031	75	6

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil ERGS uS/cm 6/27/2012 Preplant	ZEAMX Soil ORP ORP 6/27/2012 Preplant	ZEAMX Soil pH pH 6/27/2012 Preplant	ZEAMX Soil Copper ppm 6/27/2012 Preplant	ZEAMX Soil Iron ppm 6/27/2012 Preplant	ZEAMX Soil Zinc ppm 6/27/2012 Preplant
Trt	Treatment	Rate	Appl						
No.	Name	Rate Unit	Code Plot						
1	0-0-60	200LB/A	A 101	202	28	6.2	0.6	26.7	2.0
	11-52-0	200LB/A	A 202	206	28	6.1	0.7	50.3	1.4
	Pelleted	300LB/A	A 303	218	29	6.0	0.9	29.2	4.9
	Calcium	100LB/A	A 401	199	29	6.0	0.7	24.0	2.2
	Micro Mix	27GAL/A	C						
	UAN	1GAL/A	D						
	SumaGro	0.5GAL/A	E						
	SumaGro								
			Mean =	206	29	6.1	0.7	32.6	2.6
2	0-0-60	200LB/A	A 103	215	29	6.0	0.8	37.4	1.6
	11-52-0	200LB/A	A 201	209	29	6.0	0.8	57.3	1.5
	Pelleted	300LB/A	A 302	179	29	5.9	0.6	34.5	3.9
	Calcium	100LB/A	A 403	222	30	5.9	0.6	33.5	3.6
	Micro Mix	27GAL/A	C						
	UAN	1GAL/A	D						
	SumaGro	1GAL/A	E						
	SumaGro								
			Mean =	206	29	6.0	0.7	40.7	2.7
3	0-0-60	200LB/A	A 102	218	30	5.9	0.8	29.9	2.3
	11-52-0	200LB/A	A 203	227	30	6.2	0.8	33.8	2.6
	18-46-0	100LB/A	B 301	204	30	6.1	0.5	39.3	3.1
	Pelleted	300LB/A	A 402	333	29	5.5	0.7	48.0	5.4
	Calcium	100LB/A	A						
	Micro Mix	54GAL/A	C						
	UAN								
			Mean =	246	30	5.9	0.7	37.8	3.4

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil Manganese ppm 6/27/2012 Preplant	ZEAMX Soil Humus Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Nitrates Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Ammonia Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Phosphorus Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Potassium Lb/Acre 11/9/2012 Post Har
Trt	Treatment	Rate	Appl						
No.	Name	Rate Unit	Code Plot						
1	0-0-60	200LB/A	A 101	5.7	10	20	4	24	196
	11-52-0	200LB/A	A 202	2.6	10	20	4	34	202
	Pelleted	300LB/A	A 303	10.1	9	20	4	11	210
	Calcium	100LB/A	A 401	8.5	9	40	4	20	201
	Micro Mix	27GAL/A	C						
	UAN	1GAL/A	D						
	SumaGro	0.5GAL/A	E						
			Mean =	6.7	10	25	4	22	202
2	0-0-60	200LB/A	A 103	6.1	10	20	4	25	191
	11-52-0	200LB/A	A 201	3.3	15	30	4	47	211
	Pelleted	300LB/A	A 302	10.7	6	30	4	13	210
	Calcium	100LB/A	A 403	11.3	7	8	4	9	198
	Micro Mix	27GAL/A	C						
	UAN	1GAL/A	D						
	SumaGro	1GAL/A	E						
			Mean =	7.9	10	22	4	24	203
3	0-0-60	200LB/A	A 102	9.3	8	15	4	16	200
	11-52-0	200LB/A	A 203	9.3	7	40	4	31	190
	18-46-0	100LB/A	B 301	8.9	7	100	4	25	217
	Pelleted	300LB/A	A 402	9.8	7	50	4	16	178
	Calcium	100LB/A	A						
	Micro Mix	54GAL/A	C						
	UAN								
			Mean =	9.3	7	51	4	22	196

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil Calcium Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Magnesium Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Sodium ppm 11/9/2012 Post Har	ZEAMX Soil ERGS uS/cm 11/9/2012 Post Har	ZEAMX Soil ORP ORP 11/9/2012 Post Har	ZEAMX Soil pH pH 11/9/2012 Post Har
Trt	Treatment	Rate	Appl						
No.	Name	Rate	Unit	Code Plot					
1	0-0-60	200LB/A	A	101	1150	89	2	131	26.10
	11-52-0	200LB/A	A	202	1232	95	2	108	26.58
	Pelleted	300LB/A	A	303	1008	72	2	105	26.35
	Calcium								
	Micro Mix	100LB/A	A	401	1053	81	2	145	26.55
	UAN	27GAL/A	C						
	SumaGro	1GAL/A	D						
	SumaGro	0.5GAL/A	E						
				Mean =	1111	84	2	122	26.40
2	0-0-60	200LB/A	A	103	1090	83	4	170	27.45
	11-52-0	200LB/A	A	201	1257	98	2	161	27.27
	Pelleted	300LB/A	A	302	964	73	2	177	27.11
	Calcium								
	Micro Mix	100LB/A	A	403	955	72	2	106	28.06
	UAN	27GAL/A	C						
	SumaGro	1GAL/A	D						
	SumaGro	1GAL/A	E						
				Mean =	1067	82	3	154	27.47
3	0-0-60	200LB/A	A	102	1124	80	2	125	28.03
	11-52-0	200LB/A	A	203	1159	79	2	183	27.64
	18-46-0	100LB/A	B	301	1043	78	6	432	27.11
	Pelleted	300LB/A	A	402	909	65	2	187	27.45
	Calcium								
	Micro Mix	100LB/A	A						
	UAN	54GAL/A	C						
				Mean =	1059	76	3	232	27.56

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil Copper ppm 11/9/2012 Post Har	ZEAMX Soil Iron ppm 11/9/2012 Post Har	ZEAMX Soil Zinc ppm 11/9/2012 Post Har	ZEAMX Soil Manganese ppm 11/9/2012 Post Har	ZEAMX Soil TEC 11/7/2012 Post Har	ZEAMX Soil pH 11/7/2012 Post Har
Trt No.	Treatment Name	Rate Rate Unit	Appl Code Plot						
1	0-0-60	200LB/A	A 101	0.60	69.10	1.40	4.92	8.460	6.10
	11-52-0	200LB/A	A 202	0.74	123.32	1.60	0.42	8.560	6.40
	Pelleted Calcium	300LB/A	A 303	0.72	83.22	10.92	6.78	12.280	5.80
	Micro Mix	100LB/A	A 401	0.88	51.28	4.22	15.70	9.350	6.10
	UAN	27GAL/A	C						
	SumaGro	1GAL/A	D						
	SumaGro	0.5GAL/A	E						
			Mean =	0.74	81.73	4.54	6.96	9.663	6.10
2	0-0-60	200LB/A	A 103	0.72	43.66	1.52	3.98	8.860	6.30
	11-52-0	200LB/A	A 201	0.88	120.92	1.70	2.90	10.670	6.20
	Pelleted Calcium	300LB/A	A 302	0.72	35.62	2.02	6.54	9.830	5.80
	Micro Mix	100LB/A	A 403	0.86	28.12	3.46	5.22	7.500	6.40
	UAN	27GAL/A	C						
	SumaGro	1GAL/A	D						
	SumaGro	1GAL/A	E						
			Mean =	0.80	57.08	2.18	4.66	9.215	6.18
3	0-0-60	200LB/A	A 102	1.06	37.24	2.42	6.34	8.150	6.30
	11-52-0	200LB/A	A 203	0.96	41.64	2.20	7.08	9.690	6.20
	18-46-0	100LB/A	B 301	0.72	40.40	3.74	9.20	8.610	6.00
	Pelleted Calcium	300LB/A	A 402	0.48	28.76	6.56	6.90	7.960	6.00
	Micro Mix	100LB/A	A						
	UAN	54GAL/A	C						
			Mean =	0.81	37.01	3.73	7.38	8.603	6.13

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil OM	ZEAMX Soil S ppm	ZEAMX Soil P Lbs/A	ZEAMX Soil Ca Lbs/A	ZEAMX Soil Mg Lbs/A	ZEAMX Soil K Lbs/A
				11/7/2012 Post Har	11/7/2012 Post Har	11/7/2012 Post Har	11/7/2012 Post Har	11/7/2012 Post Har	11/7/2012 Post Har
Trt Treatment No. Name	Rate Rate Unit	Appl Code	Plot						
1 0-0-60	200LB/A	A	101	2.430	14.0	96.0	2272.0	206.0	217.0
11-52-0	200LB/A	A	202	3.210	17.0	179.0	2760.0	220.0	248.0
Pelleted Calcium	300LB/A	A	303	3.110	17.0	93.0	6106.0	183.0	296.0
Micro Mix	100LB/A	A	401	2.490	18.0	78.0	2595.0	170.0	226.0
UAN	27GAL/A	C							
SumaGro	1GAL/A	D							
SumaGro	0.5GAL/A	E							
Mean =				2.810	16.5	111.5	3433.3	194.8	246.8
2 0-0-60	200LB/A	A	103	2.400	20.0	109.0	2460.0	226.0	243.0
11-52-0	200LB/A	A	201	2.520	18.0	205.0	2948.0	243.0	304.0
Pelleted Calcium	300LB/A	A	302	2.790	25.0	92.0	2354.0	205.0	309.0
Micro Mix	100LB/A	A	403	3.080	17.0	68.0	2054.0	201.0	314.0
UAN	27GAL/A	C							
SumaGro	1GAL/A	D							
SumaGro	1GAL/A	E							
Mean =				2.698	20.0	118.5	2454.0	218.8	292.5
3 0-0-60	200LB/A	A	102	2.750	14.0	113.0	2284.0	183.0	276.0
11-52-0	200LB/A	A	203	2.950	21.0	166.0	2710.0	196.0	279.0
18-46-0	100LB/A	B	301	2.840	15.0	121.0	2216.0	201.0	307.0
Pelleted Calcium	300LB/A	A	402	2.760	16.0	94.0	2096.0	173.0	236.0
Micro Mix	100LB/A	A							
UAN	54GAL/A	C							
Mean =				2.825	16.5	123.5	2326.5	188.3	274.5

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage					ZEAMX Soil Na Lbs/A 11/7/2012 Post Har	ZEAMX Soil Ca B Sat % 11/7/2012 Post Har	ZEAMX Soil Mg B Sat % 11/7/2012 Post Har	ZEAMX Soil K B Sat % 11/7/2012 Post Har	ZEAMX Soil Na B Sat % 11/7/2012 Post Har	ZEAMX Soil B ppm 11/7/2012 Post Har
Trt	Treatment	Rate	Appl							
No.	Name	Rate	Unit	Code Plot						
1	0-0-60	200LB/A	A	101	30.0	67.110	10.140	3.29000033	0.780	0.330
	11-52-0	200LB/A	A	202	39.0	72.200	9.590	3.33000033	0.900	0.350
	Pelleted									
	Calcium	300LB/A	A	303	40.0	63.220	6.210	3.09000031	0.700	0.290
	Micro Mix	100LB/A	A	401	51.0	69.440	7.570	3.10000031	1.180	0.310
	UAN	27GAL/A	C							
	SumaGro	1GAL/A	D							
	SumaGro	0.5GAL/A	E							
				Mean =	40.0	67.993	8.378	3.20250032	0.890	0.320
2	0-0-60	200LB/A	A	103	33.0	69.440	10.630	3.52000035	0.810	0.350
	11-52-0	200LB/A	A	201	26.0	69.100	9.490	3.65000037	0.540	0.360
	Pelleted									
	Calcium	300LB/A	A	302	26.0	59.890	8.690	4.03000060	0.580	0.360
	Micro Mix	100LB/A	A	403	35.0	68.470	11.170	5.37000054	1.010	0.410
	UAN	27GAL/A	C							
	SumaGro	1GAL/A	D							
	SumaGro	1GAL/A	E							
				Mean =	30.0	66.725	9.995	4.14250046	0.735	0.370
3	0-0-60	200LB/A	A	102	25.0	70.040	9.350	4.34000043	0.660	0.440
	11-52-0	200LB/A	A	203	35.0	69.880	8.420	3.69000037	0.790	0.390
	18-46-0	100LB/A	B	301	37.0	64.350	9.730	4.57000046	0.940	0.410
	Pelleted									
	Calcium	300LB/A	A	402	32.0	65.850	9.060	3.80000038	0.880	0.470
	Micro Mix	100LB/A	A							
	UAN	54GAL/A	C							
				Mean =	32.3	67.530	9.140	4.10000041	0.818	0.428

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Soil Fe ppm 11/7/2012 Post Har	ZEAMX Soil Mn ppm 11/7/2012 Post Har	ZEAMX Soil Cu ppm 11/7/2012 Post Har	ZEAMX Soil Zn ppm 11/7/2012 Post Har	ZEAMX Soil Al ppm 11/7/2012 Post Har
Trt	Treatment	Rate	Appl					
No.	Name	Rate Unit	Code Plot					
1	0-0-60	200LB/A	A 101	243.0	33.0	1.460	3.360	473.0
	11-52-0	200LB/A	A 202	321.0	123.0	1.090	3.180	484.0
	Pelleted	300LB/A	A 303	198.0	62.0	1.220	12.790	696.0
	Calcium	100LB/A	A 401	171.0	64.0	1.070	6.310	554.0
	Micro Mix	27GAL/A	C					
	UAN	1GAL/A	D					
	SumaGro	0.5GAL/A	E					
			Mean =	233.3	70.5	1.210	6.410	551.8
2	0-0-60	200LB/A	A 103	249.0	27.0	1.380	3.990	469.0
	11-52-0	200LB/A	A 201	332.0	12.0	1.050	3.260	473.0
	Pelleted	300LB/A	A 302	219.0	76.0	1.360	8.090	535.0
	Calcium	100LB/A	A 403	181.0	65.0	1.320	9.070	473.0
	Micro Mix	27GAL/A	C					
	UAN	1GAL/A	D					
	SumaGro	1GAL/A	E					
			Mean =	245.3	45.0	1.278	6.103	487.5
3	0-0-60	200LB/A	A 102	207.0	55.0	1.410	4.960	469.0
	11-52-0	200LB/A	A 203	214.0	56.0	1.540	5.660	479.0
	18-46-0	100LB/A	B 301	205.0	69.0	1.130	7.250	478.0
	Pelleted	300LB/A	A 402	200.0	60.0	1.110	11.510	473.0
	Calcium	100LB/A	A					
	Micro Mix	54GAL/A	C					
	UAN							
			Mean =	206.5	60.0	1.298	7.345	474.8

Arise Research & Discovery, Inc.

Field Plot Evaluation for SumaGrow on Corn.

Trial ID: 12-BSE0212-12

Study Dir.:

Dr.Lalitha

Location: Martinsville

Investigator:

Dr. Roy M Stephen

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX grain Yield bu/ac 10/16/2012 R3	ZEAMX Stalks Plant Pop no./ac 8/1/2012 V-3	ZEAMX Grain Moisture % 10/16/2012 Harvest	ZEAMX Grain Dry Matt % 10/16/2012 Harvest	ZEAMX Grain Nitrogen % 10/16/2012 Harvest	ZEAMX Grain Crude Protein % 10/16/2012 Harvest
Trt Treatment No. Name	Rate RateUnit	Appl Code						
1 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 0.5GAL/A	A A A A C D E	84 a	27438 a	72.35 a	27.65 a	1.57 a	9.83 a
2 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 1GAL/A	A A A A C D E	89 a	27125 a	70.44 a	29.57 a	1.45 a	9.03 a
3 0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A 200LB/A 100LB/A 300LB/A 100LB/A 54GAL/A	A A B A A C	82 a	27500 a	72.61 a	27.39 a	1.52 a	9.50 a
LSD (P=.05)	26.2			2655.8	6.967	6.967	0.184	1.149
Standard Deviation	15.1			1534.9	4.026	4.026	0.106	0.664
CV	17.87			5.61	5.61	14.28	7.04	7.03
Bartlett's X2	1.639			3.23	2.369	2.369	14.085	14.26
P(Bartlett's X2)	0.441			0.199	0.306	0.306	0.001*	0.001*
Replicate F	0.275			2.313	0.430	0.430	0.377	0.377
Replicate Prob(F)	0.8419			0.1757	0.7391	0.7391	0.7730	0.7730
Treatment F	0.241			0.069	0.349	0.349	1.450	1.456
Treatment Prob(F)	0.7934			0.9345	0.7188	0.7188	0.3063	0.3052

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage				ZEAMX Grain Calcium % 10/16/2012 Harvest	ZEAMX Grain Potassium % 10/16/2012 Harvest	ZEAMX Grain Magnesium % 10/16/2012 Harvest	ZEAMX Grain Sodium % 10/16/2012 Harvest	ZEAMX Grain Phosphorus % 10/16/2012 Harvest	ZEAMX Grain Sulfur % 10/16/2012 Harvest							
Trt	Treatment	Rate	Appl													
No.	Name	Rate	Unit	Code												
1	0-0-60	200LB/A	A		0.14	a	1.27	a	0.15	a	0.01	a	0.36	a	0.13	a
	11-52-0	200LB/A	A													
	Pelleted	300LB/A	A													
	Calcium															
	Micro Mix	100LB/A	A													
	UAN	27GAL/A	C													
	SumaGro	1GAL/A	D													
	SumaGro	0.5GAL/A	E													
2	0-0-60	200LB/A	A		0.08	a	1.24	a	0.16	a	0.01	a	0.39	a	0.13	a
	11-52-0	200LB/A	A													
	Pelleted	300LB/A	A													
	Calcium															
	Micro Mix	100LB/A	A													
	UAN	27GAL/A	C													
	SumaGro	1GAL/A	D													
	SumaGro	1GAL/A	E													
3	0-0-60	200LB/A	A		0.06	a	1.26	a	0.16	a	0.01	a	0.40	a	0.13	a
	11-52-0	200LB/A	A													
	18-46-0	100LB/A	B													
	Pelleted															
	Calcium	300LB/A	A													
	Micro Mix	100LB/A	A													
	UAN	54GAL/A	C													
LSD (P=.05)					0.119		0.211		0.018		0.000		0.028		0.017	
Standard Deviation					0.069		0.122		0.010		0.000		0.016		0.010	
CV					75.16		9.71		6.47		0.0		4.28		7.58	
Bartlett's X2					0.132		2.602		3.398		0.0		0.177		2.864	
P(Bartlett's X2)					0.936		0.272		0.183		.		0.915		0.239	
Replicate F					0.321		0.092		2.378		0.000		6.375		0.229	
Replicate Prob(F)					0.8107		0.9619		0.1687		1.0000		0.0270		0.8733	
Treatment F					1.740		0.075		2.514		0.000		5.375		0.771	
Treatment Prob(F)					0.2536		0.9290		0.1611		1.0000		0.0460		0.5033	

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Grain Aluminum ppm 10/16/2012 Harvest	ZEAMX Grain Boron ppm 10/16/2012 Harvest	ZEAMX Grain Copper ppm 10/16/2012 Harvest	ZEAMX Grain Iron ppm 10/16/2012 Harvest	ZEAMX Grain Manganese ppm 10/16/2012 Harvest	ZEAMX Grain Zinc ppm 10/16/2012 Harvest
Trt Treatment No. Name	Rate Rate Unit	Appl Code						
1 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 0.5GAL/A	A A A A C D E	48 a	7 a	5 a	42 a	23 a	41 a
2 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 1GAL/A	A A A A C D E	33 a	6 a	4 a	42 a	18 a	39 a
3 0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A 200LB/A 100LB/A 300LB/A 100LB/A 54GAL/A	A A B A A C	18 a	6 a	4 a	46 a	20 a	43 a
LSD (P=.05)			32.9	2.0	1.0	6.5	4.9	8.5
Standard Deviation			19.0	1.2	0.6	3.8	2.8	4.9
CV			58.32	18.23	12.52	8.74	13.87	11.95
Bartlett's X2			5.58	1.185	0.095	1.264	3.276	3.79
P(Bartlett's X2)			0.061	0.553	0.953	0.531	0.194	0.15
Replicate F			2.751	0.500	5.364	0.409	2.268	1.017
Replicate Prob(F)			0.1347	0.6959	0.0391	0.7522	0.1808	0.4483
Treatment F			2.493	1.000	3.545	1.346	2.814	0.851
Treatment Prob(F)			0.1629	0.4219	0.0963	0.3288	0.1374	0.4727

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Ear Leaf Brix %		ZEAMX Ear Leaf Chlorophyll %		ZEAMX Soil Humus Lb/Acre		ZEAMX Soil Nitrates Lb/Acre		ZEAMX Soil Ammonia Lb/Acre		ZEAMX Soil Phosphorus Lb/Acre		ZEAMX Soil Potassium Lb/Acre	
Trt Treatment No. Name Rate Rate Unit Appl Code			9/14/2012		9/14/2012		6/27/2012 Preplant		6/27/2012 Preplant		6/27/2012 Preplant		6/27/2012 Preplant		6/27/2012 Preplant	
1	0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A A 200LB/A A 300LB/A A 100LB/A A 27GAL/A C 1GAL/A D 0.5GAL/A E	6.99	a	56.0	a	9	a	26	a	3	b	7	a	153	a
2	0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A A 200LB/A A 300LB/A A 100LB/A A 27GAL/A C 1GAL/A D 1GAL/A E	6.68	a	56.2	a	8	a	24	a	3	b	5	a	163	a
3	0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A A 200LB/A A 100LB/A B 300LB/A A 100LB/A A 54GAL/A C	7.28	a	56.6	a	5	a	31	a	5	a	11	a	172	a
LSD (P=.05)			2.437		4.26		8.9		23.1		1.9		17.3		26.3	
Standard Deviation			1.408		2.46		5.1		13.4		1.1		10.0		15.2	
CV			20.17		4.38		73.31		49.66		31.59		127.93		9.37	
Bartlett's X2			0.102		7.655		8.009		5.524		1.55		6.01		0.049	
P(Bartlett's X2)			0.95		0.022*		0.018*		0.063		0.461		0.05*		0.976	
Replicate F			0.309		0.578		2.734		1.254		3.182		0.488		3.950	
Replicate Prob(F)			0.8187		0.6504		0.1361		0.3707		0.1059		0.7032		0.0718	
Treatment F			0.182		0.047		0.722		0.282		5.727		0.379		1.523	
Treatment Prob(F)			0.8383		0.9544		0.5238		0.7639		0.0406		0.6997		0.2918	

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Soil Calcium Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Magnesium Lb/Acre 6/27/2012 Preplant	ZEAMX Soil Sodium ppm 6/27/2012 Preplant	ZEAMX Soil ERGS uS/cm 6/27/2012 Preplant	ZEAMX Soil ORP ORP 6/27/2012 Preplant	ZEAMX Soil pH pH 6/27/2012 Preplant	ZEAMX Soil Copper ppm 6/27/2012 Preplant
Trt No.	Treatment Name	Rate RateUnit Unit Code							
1	0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A A 200LB/A A 300LB/A A 100LB/A A 27GAL/A C 1GAL/A D 0.5GAL/A E	1033 a	77 a	4 a	206 a	29 a	6.1 a	0.7 a
2	0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A A 200LB/A A 300LB/A A 100LB/A A 27GAL/A C 1GAL/A D 1GAL/A E	1086 a	82 a	4 a	206 a	29 a	6.0 a	0.7 a
3	0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A A 200LB/A A 100LB/A B 300LB/A A 100LB/A A 54GAL/A C	1031 a	75 a	6 a	246 a	30 a	5.9 a	0.7 a
LSD (P=.05)			85.0	8.6	2.6	60.5	1.0	0.30	0.25
Standard Deviation			49.1	5.0	1.5	35.0	0.6	0.17	0.14
CV			4.68	6.4	31.94	15.95	2.06	2.85	20.38
Bartlett's X2			1.537	1.279	0.818	8.857	0.078	7.584	0.114
P(Bartlett's X2)			0.464	0.528	0.366	0.012*	0.962	0.023*	0.945
Replicate F			6.314	2.065	2.800	1.203	0.308	1.714	0.360
Replicate Prob(F)			0.0276	0.2064	0.1310	0.3860	0.8195	0.2627	0.7845
Treatment F			1.589	2.160	2.400	1.678	4.385	0.886	0.040
Treatment Prob(F)			0.2794	0.1965	0.1715	0.2637	0.0670	0.4602	0.9610

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Soil Iron ppm 6/27/2012 Preplant	ZEAMX Soil Zinc ppm 6/27/2012 Preplant	ZEAMX Soil Manganese ppm 6/27/2012 Preplant	ZEAMX Soil Humus Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Nitrates Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Ammonia Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Phosphor Lb/Acre 11/9/2012 Post Har
Trt No.	Treatment Name	Rate Unit	Appl Code						
1	0-0-60	200LB/A	A	32.6 a	2.6 a	6.7 a	10 a	25 a	4 a
	11-52-0	200LB/A	A						
	Pelleted	300LB/A	A						
	Calcium	100LB/A	A						
	Micro Mix	27GAL/A	C						
	UAN	1GAL/A	D						
	SumaGro	0.5GAL/A	E						
2	0-0-60	200LB/A	A	40.7 a	2.7 a	7.9 a	10 a	22 a	4 a
	11-52-0	200LB/A	A						
	Pelleted	300LB/A	A						
	Calcium	100LB/A	A						
	Micro Mix	27GAL/A	C						
	UAN	1GAL/A	D						
	SumaGro	1GAL/A	E						
3	0-0-60	200LB/A	A	37.8 a	3.4 a	9.3 a	7 a	51 a	4 a
	11-52-0	200LB/A	A						
	18-46-0	100LB/A	B						
	Pelleted	300LB/A	A						
	Calcium	100LB/A	A						
	Micro Mix	54GAL/A	C						
	UAN								
LSD (P=.05)				16.70	1.81	3.66	3.8	38.1	0.0
Standard Deviation				9.65	1.04	2.12	2.2	22.0	0.0
CV				26.1	36.35	26.59	25.2	67.22	0.0
Bartlett's X2				0.519	0.105	9.179	13.326	5.896	0.0
P(Bartlett's X2)				0.771	0.949	0.01*	0.001*	0.052	.
Replicate F				1.559	3.515	3.707	1.480	1.058	0.000
Replicate Prob(F)				0.2941	0.0889	0.0808	0.3118	0.4335	1.0000
Treatment F				0.727	0.620	1.516	1.389	2.137	0.000
Treatment Prob(F)				0.5216	0.5690	0.2932	0.3194	0.1992	1.0000

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Soil Potassium Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Calcium Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Magnesium Lb/Acre 11/9/2012 Post Har	ZEAMX Soil Sodium ppm 11/9/2012 Post Har	ZEAMX Soil ERGS uS/cm 11/9/2012 Post Har	ZEAMX Soil ORP ORP 11/9/2012 Post Har	ZEAMX Soil pH pH 11/9/2012 Post Har
Trt Treatment No. Name	Rate Rate Unit	Appl Code							
1 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 0.5GAL/A	A A A A C D E	202 a	1111 a	84 a	2 a	122 a	26.40 b	6.17 a
2 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 1GAL/A	A A A A C D E	203 a	1067 a	82 a	3 a	154 a	27.47 a	6.29 a
3 0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A 200LB/A 100LB/A 300LB/A 100LB/A 54GAL/A	A A B A A C	196 a	1059 a	76 a	3 a	232 a	27.56 a	6.24 a
LSD (P=.05)			15.9	85.5	10.9	2.4	143.1	0.601	0.285
Standard Deviation			9.2	49.4	6.3	1.4	82.7	0.347	0.165
CV			4.59	4.58	7.86	54.97	48.89	1.28	2.64
Bartlett's X2			2.769	0.348	0.755	1.268	10.199	1.086	0.091
P(Bartlett's X2)			0.25	0.84	0.686	0.26	0.006*	0.581	0.955
Replicate F			2.720	15.320	5.378	0.647	0.929	1.065	2.679
Replicate Prob(F)			0.1372	0.0032	0.0389	0.6128	0.4822	0.4312	0.1405
Treatment F			0.592	1.289	2.003	0.529	1.861	13.874	0.581
Treatment Prob(F)			0.5827	0.3422	0.2156	0.6141	0.2351	0.0056	0.5880

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Soil Copper ppm 11/9/2012 Post Har	ZEAMX Soil Iron ppm 11/9/2012 Post Har	ZEAMX Soil Zinc ppm 11/9/2012 Post Har	ZEAMX Soil Manganese ppm 11/9/2012 Post Har	ZEAMX Soil TEC 11/7/2012 Post Har	ZEAMX Soil pH 11/7/2012 Post Har	ZEAMX Soil OM 11/7/2012 Post Har
Trt Treatment No. Name	Rate Rate Unit	Appl Code							
1 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 0.5GAL/A	A A A A C D E	0.74 a	81.73 a	4.54 a	6.96 a	9.663 a	6.10 a	2.810 a
2 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 1GAL/A	A A A A C D E	0.80 a	57.08 a	2.18 a	4.66 a	9.215 a	6.18 a	2.698 a
3 0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A 200LB/A 100LB/A 300LB/A 100LB/A 54GAL/A	A A B A A C	0.81 a	37.01 a	3.73 a	7.38 a	8.603 a	6.13 a	2.825 a
LSD (P=.05)			0.338	35.998	4.418	6.160	2.1262	0.278	0.5060
Standard Deviation			0.195	20.805	2.553	3.560	1.2288	0.161	0.2924
CV			25.09	35.5	73.36	56.23	13.41	2.62	10.53
Bartlett's X2			3.622	7.253	5.967	8.361	1.726	0.887	4.579
P(Bartlett's X2)			0.163	0.027*	0.051	0.015*	0.422	0.642	0.101
Replicate F			0.309	4.526	1.769	1.563	1.747	3.871	1.109
Replicate Prob(F)			0.8189	0.0552	0.2527	0.2932	0.2567	0.0745	0.4162
Treatment F			0.150	4.637	0.883	0.676	0.750	0.226	0.227
Treatment Prob(F)			0.8636	0.0606	0.4611	0.5437	0.5119	0.8044	0.8033

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Soil S ppm 11/7/2012 Post Har	ZEAMX Soil P Lbs/A 11/7/2012 Post Har	ZEAMX Soil Ca Lbs/A 11/7/2012 Post Har	ZEAMX Soil Mg Lbs/A 11/7/2012 Post Har	ZEAMX Soil K Lbs/A 11/7/2012 Post Har	ZEAMX Soil Na Lbs/A 11/7/2012 Post Har	ZEAMX Soil Ca B Sat % 11/7/2012 Post Har
Trt No.	Treatment Name	Rate Unit	Appl Code						
1	0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 0.5GAL/A	A A A A C D E	16.5 a	111.5 a	3433.3 a	194.8 b	246.8 a	40.0 a 67.993 a
2	0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 1GAL/A	A A A A C D E	20.0 a	118.5 a	2454.0 a	218.8 a	292.5 a	30.0 a 66.725 a
3	0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A 200LB/A 100LB/A 300LB/A 100LB/A 54GAL/A	A A B A A C	16.5 a	123.5 a	2326.5 a	188.3 b	274.5 a	32.3 a 67.530 a
LSD (P=.05)				5.38	27.74	1874.82	20.29	43.62	3.4858
Standard Deviation				3.11	16.03	1083.53	11.73	25.21	2.0146
CV				17.6	13.6	39.58	5.85	9.29	2.99
Bartlett's X2				1.349	1.174	10.51	0.865	0.1	0.571
P(Bartlett's X2)				0.509	0.556	0.005*	0.649	0.951	0.752
Replicate F				0.621	23.783	0.918	5.614	3.045	8.750
Replicate Prob(F)				0.6269	0.0010	0.4868	0.0355	0.1141	0.0131
Treatment F				1.690	0.565	1.249	7.505	3.343	0.405
Treatment Prob(F)				0.2618	0.5957	0.3519	0.0233	0.1058	0.6836

Arise Research & Discovery, Inc.

Crop Code Part Rated Rating Data Type Rating Unit Rating Date Crop Stage			ZEAMX Soil Mg B Sat % 11/7/2012 Post Har	ZEAMX Soil K B Sat % 11/7/2012 Post Har	ZEAMX Soil Na B Sat % 11/7/2012 Post Har	ZEAMX Soil B ppm 11/7/2012 Post Har	ZEAMX Soil Fe ppm 11/7/2012 Post Har	ZEAMX Soil Mn ppm 11/7/2012 Post Har
Trt Treatment No. Name	Rate Rate Unit	Appl Code						
1 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 0.5GAL/A	A A A A C D E	8.378 a	3.2025003 a	0.890 a	0.320 c	233.3 a	70.5 a
2 0-0-60 11-52-0 Pelleted Calcium Micro Mix UAN SumaGro SumaGro	200LB/A 200LB/A 300LB/A 100LB/A 27GAL/A 1GAL/A 1GAL/A	A A A A C D E	9.995 a	4.1425005 a	0.735 a	0.370 b	245.3 a	45.0 a
3 0-0-60 11-52-0 18-46-0 Pelleted Calcium Micro Mix UAN	200LB/A 200LB/A 100LB/A 300LB/A 100LB/A 54GAL/A	A A B A A C	9.140 a	4.1000004 a	0.818 a	0.428 a	206.5 a	60.0 a
LSD (P=.05)			2.1798	1.061240895	0.2690	0.0495	59.29	52.30
Standard Deviation			1.2598	0.613331120	0.1555	0.0286	34.26	30.23
CV			13.74	16.08	19.1	7.68	15.01	51.67
Bartlett's X2			3.32	7.191	0.997	0.306	9.898	6.131
P(Bartlett's X2)			0.19	0.027*	0.608	0.858	0.007*	0.047*
Replicate F			1.064	0.422	2.416	1.203	5.203	0.617
Replicate Prob(F)			0.4317	0.7443	0.1648	0.3858	0.0416	0.6288
Treatment F			1.650	2.997	0.995	14.125	1.341	0.719
Treatment Prob(F)			0.2685	0.1252	0.4233	0.0054	0.3301	0.5248

Arise Research & Discovery, Inc.

Crop Code			ZEAMX	ZEAMX	ZEAMX
Part Rated			Soil	Soil	Soil
Rating Data Type			Cu	Zn	Al
Rating Unit			ppm	ppm	ppm
Rating Date			11/7/2012	11/7/2012	11/7/2012
Crop Stage			Post Har	Post Har	Post Har
Trt	Treatment	Rate	Appl		
No.	Name	Rate Unit	Code		
1	0-0-60	200LB/A	A	1.210 a	6.410 a
	11-52-0	200LB/A	A		
	Pelleted				
	Calcium	300LB/A	A		
	Micro Mix	100LB/A	A		
	UAN	27GAL/A	C		
	SumaGro	1GAL/A	D		
	SumaGro	0.5GAL/A	E		
2	0-0-60	200LB/A	A	1.278 a	6.103 a
	11-52-0	200LB/A	A		
	Pelleted				
	Calcium	300LB/A	A		
	Micro Mix	100LB/A	A		
	UAN	27GAL/A	C		
	SumaGro	1GAL/A	D		
	SumaGro	1GAL/A	E		
3	0-0-60	200LB/A	A	1.298 a	7.345 a
	11-52-0	200LB/A	A		
	18-46-0	100LB/A	B		
	Pelleted				
	Calcium	300LB/A	A		
	Micro Mix	100LB/A	A		
	UAN	54GAL/A	C		
LSD (P=.05)			0.3139	4.0755	90.42
Standard Deviation			0.1814	2.3554	52.26
CV			14.38	35.58	10.35
Bartlett's X2			0.28	0.72	15.078
P(Bartlett's X2)			0.869	0.698	0.001*
Replicate F			1.061	4.707	2.234
Replicate Prob(F)			0.4327	0.0511	0.1848
Treatment F			0.256	0.302	2.495
Treatment Prob(F)			0.7825	0.7500	0.1627



Field Plot Evaluation for SumaGrow on Corn.

12-BSE0212-12

Summary

Summary

Field Plot Evaluation of SumaGrow on Corn for 2012

Wet early, wet late and dry and miserable hot in the middle summed up this growing season's weather here at the station.

After adequate rainfall in April, it turned dry from May 1st to the middle of August. May had a total of 1.4 inches with most of it coming very early and very late in the month. June had 0.23 inches. July had 0.4 inches. August had 4.1 inches; most of it fell after the middle of the month. September added another 6.36 inches with most of that coming during the first week as remnants from hurricane Issac.

The company was interested in data and discovery about plant growth maturity stages and grain and stalk composition where SumaGrow is used in growing corn compared to standard growing practices.

All 12 plots had 200 Lb/ac of 0-0-60 and 11-52-0 plus 300 Lb/ac of Pelleted Calcium and 100 Lb/ac of Micro Mix applied as maintenance fertilizer in the fall of 2011. The 4 control plots had an additional 100 Lb/ac of 0-0-60 and 11-52-0 broadcast and incorporated on June 27. UAN was injected at 80 LbN/ac in the SumaGrow plots and at 160 LbN/ac in the controls on June 29. Corn was planted into dry soil on July 12 and treated with SumaGrow sprayed in a 6-inch band over the row at 1.0 gal/ac. On August 3rd, additional SumaGrow was spray banded on the soil in the row when the corn was knee high at 0.5 and 1.0 gallons per acre for the two treatments.

Starting on July 17, drip irrigation was applied two rows at a time for about 4 hours per row to get the corn to germinate. Water was dripped at 40gal/hr/100ft.

SumaGrow Corn Plots at Martinsville IL, 2012



Drip irrigation Started in SumaGrow Plots, July 17, 2012



Photo on July 31, 2012. Corn is up and doing well despite dry soil conditions and heat.



Trt 1- 1.0 gal Suma Grow + 0.5 gal SumaGrow

+200Lb DAP& 0-0-60

+ 80 LbN UAN PPI



Trt 2- 1.0 gal SumaGrow + 1.0 gal SumaGrow

+ 200 Lb DAP and 0-0-60

+ 80 LbN UAN PPI



Trt 3 Control

300 Lb DAP and 300 lb 0-0-60

160 Lb UAN PPI

Photos Taken August 2nd, 2012.



1R3 2R3 3R4 3R3 1R4 2R4 Treatments



2R2, 1R2, 2R1, 1R1, 3R2, 3R1 Treatments



Treatment 1
Control

SumaGrow 1.0 + 0.5 gpa
SumaGrow

80 Lbs N of UAN
UAN

200 Lbs MAP and 0-0-60
and 0-0-60

and 0-0-60

**Final Yield for Trt 1
for Control**

**84 bu/ac
bu/ac**

Treatment 2

SumaGrow 1.0 +1.0 gpa

80 Lbs N of UAN

200 Lbs MAP and 0-0-60

Final Yield for Trt 2

89 bu/ac

Treatment 3

Zero

160 Lbs N of

200 Lbs MAP

100 Lbs DAP

Final Yield

82

All ears from the 4 stalks that were pulled from each treatment for root mass on September 9 are shown above. Treatment 2 with the heavier rate of SumaGrow and the half rate of UAN showed the most uniformity and largest developed second ears.

Treatment 2 with the heavier rate of SumaGrow went on to yield 5 more bu/ac than the normal full rate of SumaGrow and 7 more bu/ac than the Control. Assuming DAP and Potash at \$600/ton and Nitrogen at \$0.40/LbN, the control cost \$92/ac more for the extra NPK. The extra cost for SumaGrow was assumed to be \$56/gal MSRP, or \$84/ac for the full rate in Trt 1 and \$112/ac for the heavier rate in Trt 2. With corn at \$7.00 per bushel, the net advantage for the SumaGrow was \$22/ac and \$29/ac respectively for SumaGrow at full rate and the heavier rate over the control.

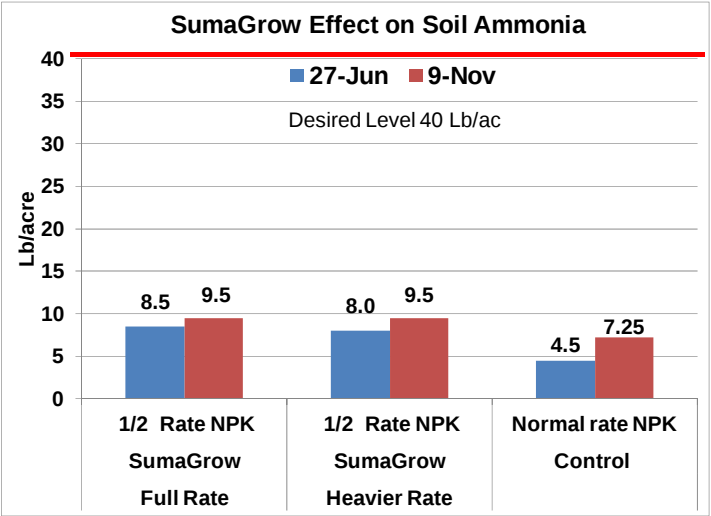
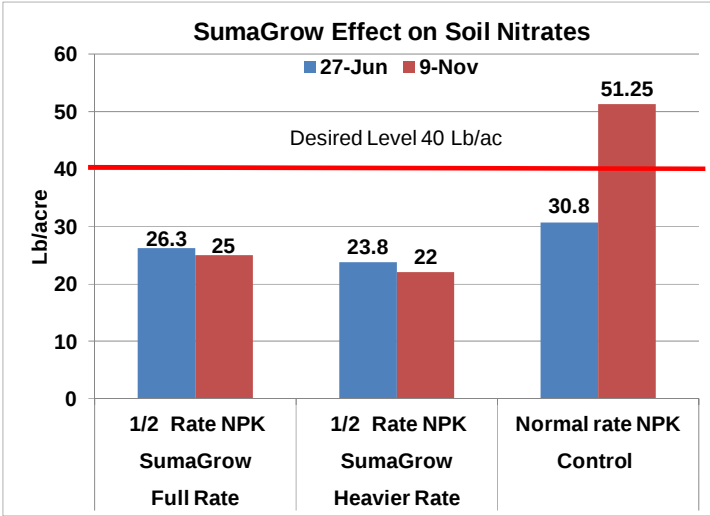
Heavy frost killed the top half of the corn plants on Oct 8 and 9 before it could black layer.

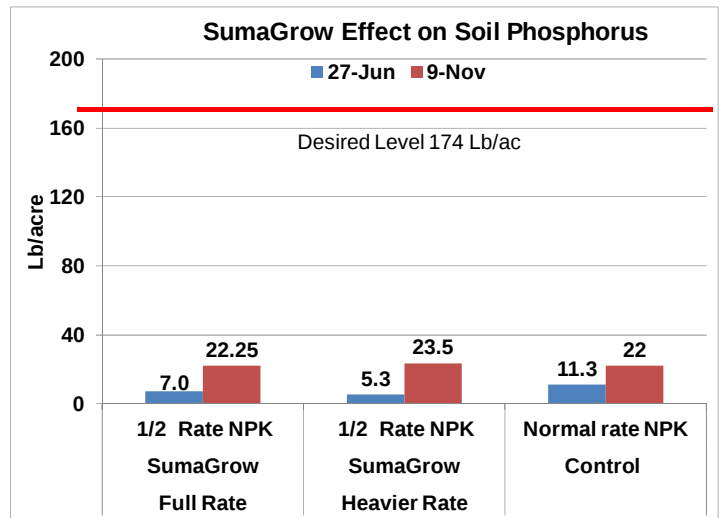
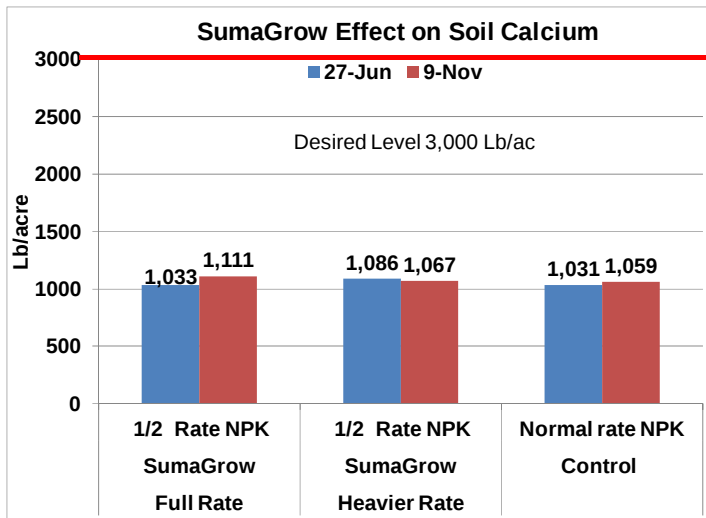


All ears from the 5th, 10th, 15th, 20th and 25th stalks in rows # 2 and 3 of each plot were hand harvested on October 16 and weighed. Averaged ear weights per stalk were multiplied by the number of stalks per acre and adjusted to 15% MC to obtain yield estimates.



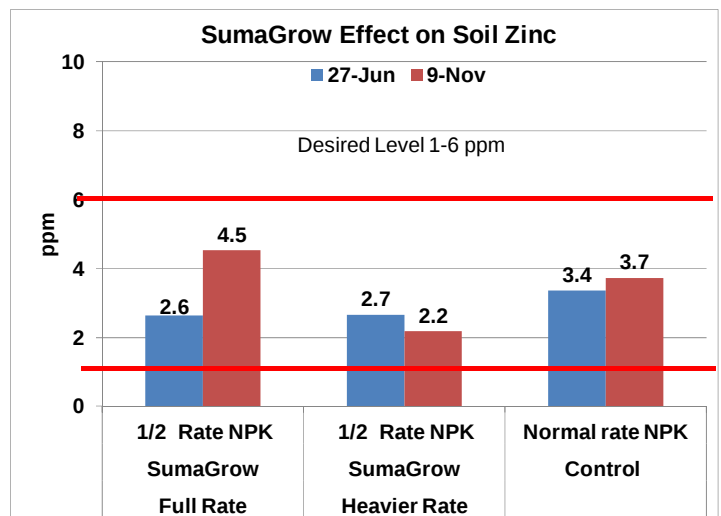
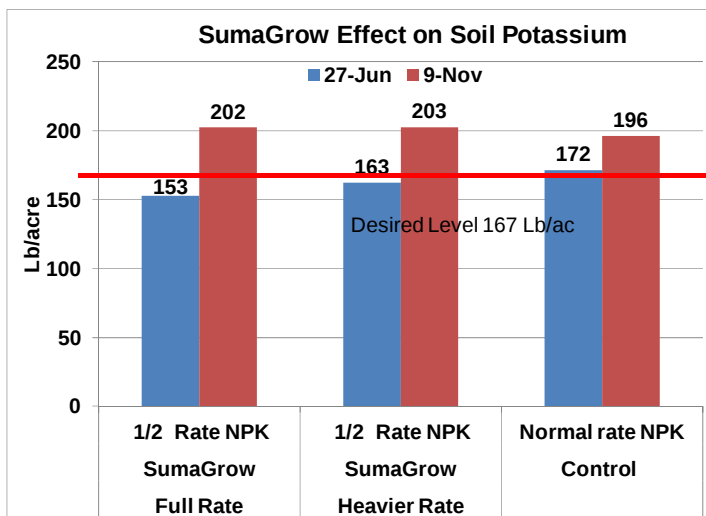
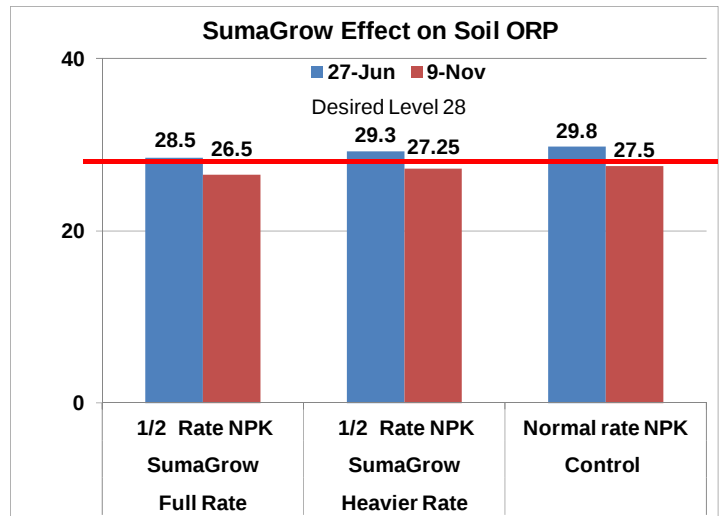
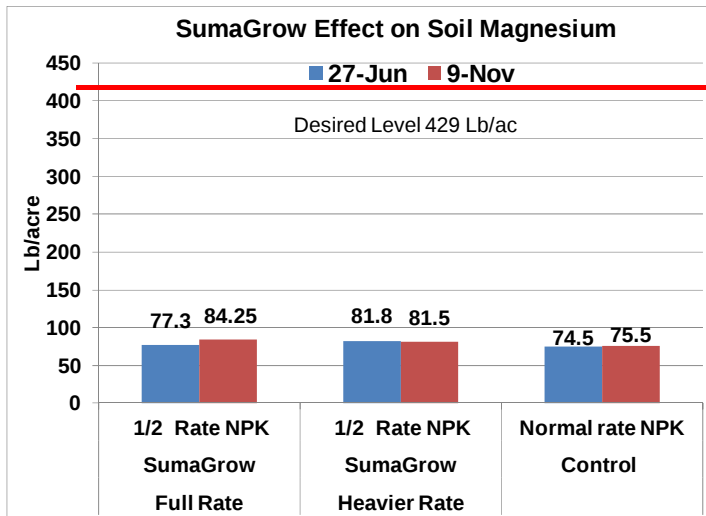
Forgot to take photo of T1R4

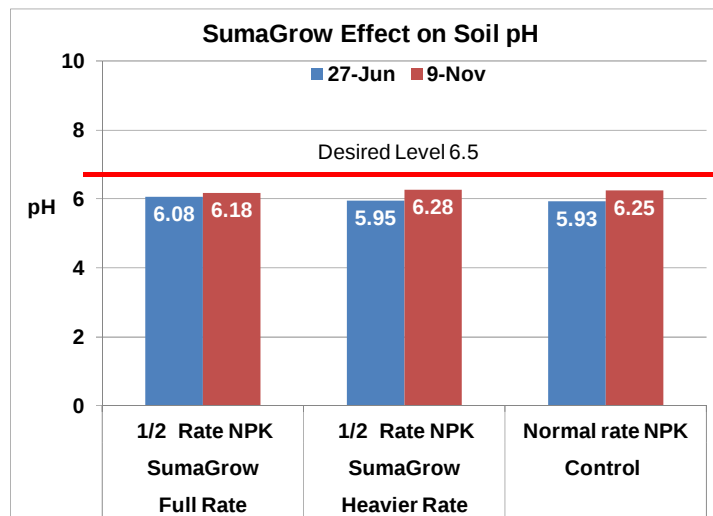
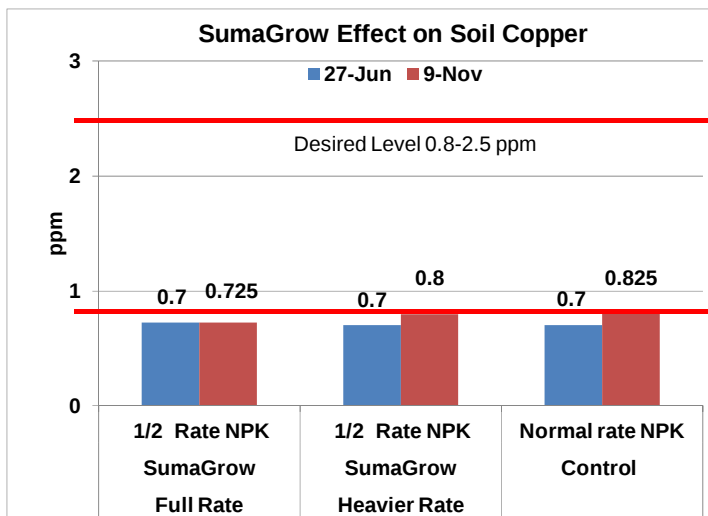




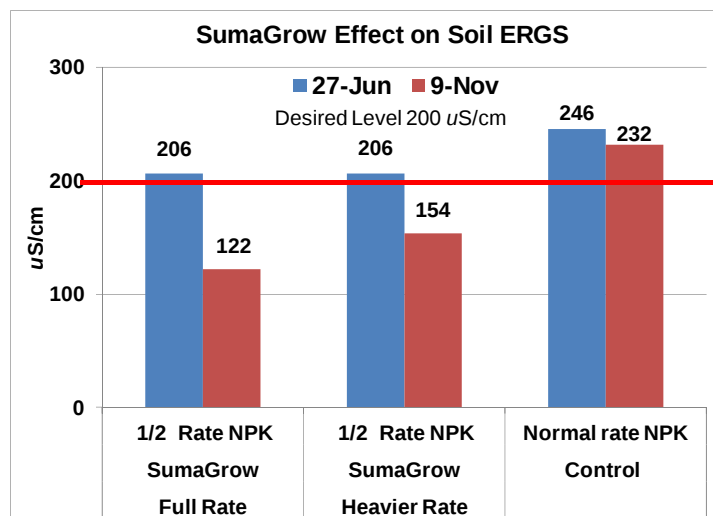
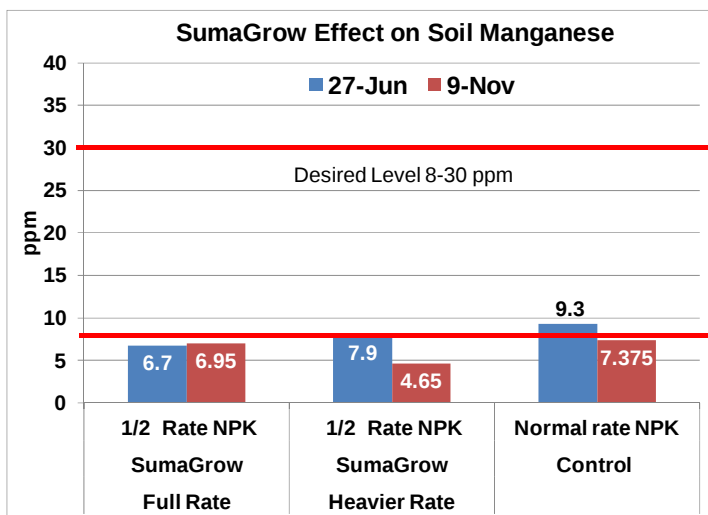
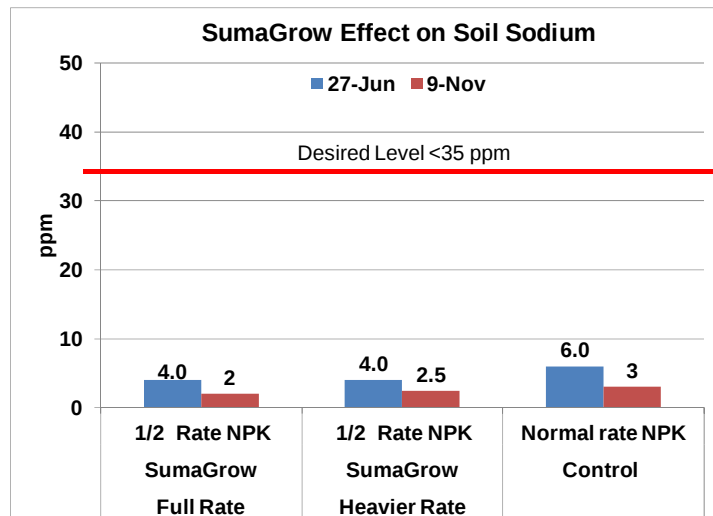
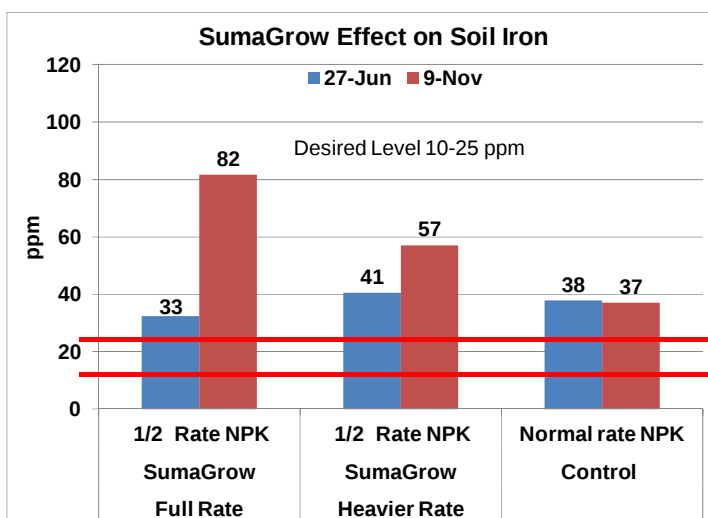
Soil sample were tested Preplant and 24 days after harvest by the LaMotte methods to see what level of nutrients were available. Nitrates decreased slightly in the SumaGrow treatments, but increased by 66 percent for the control with 160 LbN/ac. It would have been good to have a control treatment with 80 LbN/ac to compare. However,

in the dry weather the heavier rate of SumaGrow actually grew more 8% more corn on 50% less applied Nitrogen than the control. SumaGrow also did more to increase available P and K than the control. It increased P levels by up to 343% vs. 95% increase for the control, which is significant, considering the low available levels of P.



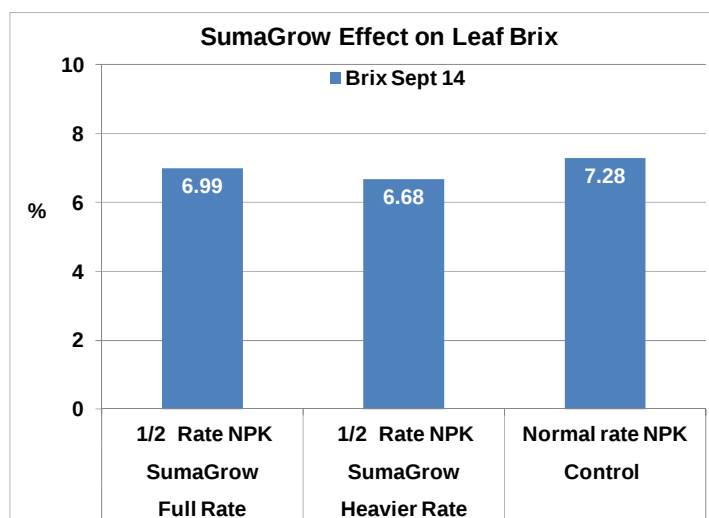
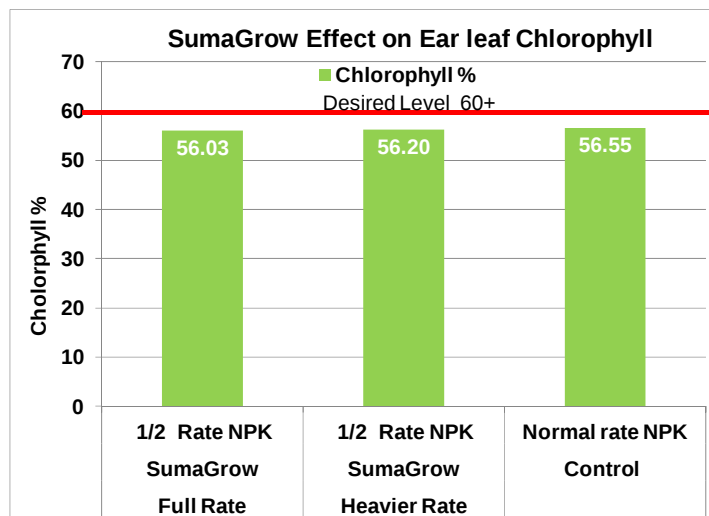


Copper increased slightly in all three treatments. Iron increased dramatically by 148 and 39 percent respectively for full rate and the heavier rate of SumaGrow, while the iron in the control declined slightly. The microbes in SumaGrow clearly worked on the iron.



The soil energy as measured by EGRS declined in all treatments, as did the available sodium levels. One possible explanation might be that the microbes transmuted the sodium into potassium. The September rains may also have moved sodium out of the upper 6 inches of soil. Either way, the soil is deficient in sodium

which has a large bearing on soil energy. Overall, the soil is deficient in available Mg, Ca, ammonia, P, Mn, Cu and Na. In addition the soil tests after harvest via the Mehlich 3 extraction show the soil is also deficient in sulfur and boron.



Chlorophyll and Brix levels were not significantly different although they were slightly higher in the Control treatment.

Summary and Conclusions

SumaGrow performed well, outyielding the control with 160 LbN/ac by 2 to 7 bu/ac while only using half as much commercial N/ac. SumaGrow had a \$22 and \$29 profit advantage over the control. It also left 66% less nitrate in the topsoil to leach over winter. SumaGrow was also adept at increasing the availability of Iron, Potassium and Phosphorus.



Field Plot Evaluation for SumaGrow on Corn.

12-BSE0212-12

Task Descriptions

Arise Research & Discovery, Inc.

Field Plot Evaluation for SumaGrow on Corn.

Trial ID: 12-BSE0212-12 Study Dir.: Dr.Lalitha
Location: Martinsville Investigator: Dr. Roy M Stephen

Schedule for 12/10/2010 to 12/10/2013

Date	Task	Done	Description
4/1/2012	Assess	Yes	Rainfall .02"
4/4/2012	Assess	Yes	Rainfall .44"
4/5/2012	Assess	Yes	Rainfall .76"
4/13/2012	Assess	Yes	Rainfall .03"
4/14/2012	Assess	Yes	Rainfall .76"
4/15/2012	Assess	Yes	Rainfall .28"
4/16/2012	Assess	Yes	Rainfall .12"
4/28/2012	Assess	Yes	Rainfall .74"
4/29/2012	Assess	Yes	Rainfall .93"
4/30/2012	Assess	Yes	Rainfall .11"
5/1/2012	Assess	Yes	Rainfall .31"
5/4/2012	Assess	Yes	Rainfall .09"
5/17/2012	Assess	Yes	Rainfall .01"
5/20/2012	Assess	Yes	Rainfall .3"
5/31/2012	Assess	Yes	Rainfall .62"
6/1/2012	Assess	Yes	Rainfall .02"
6/4/2012	Assess	Yes	Rainfall .08"
6/5/2012	Assess	Yes	104 Degrees and humid plants are very stressed.
6/11/2012	Assess	Yes	Rainfall .13"
6/30/2012	Assess	Yes	96 Degrees and humid plants are stressed.
7/1/2012	Assess	Yes	99 Degrees and humid plants are stressed.
	Assess	Yes	Rainfall .2"
7/2/2012	Assess	Yes	100 Degrees and humid plants are stressed.
7/3/2012	Assess	Yes	97 Degrees and humid plants are stressed.
7/4/2012	Assess	Yes	102 Degrees and humid plants are very stressed.
7/6/2012	Assess	Yes	103 Degrees and humid plants are very stressed.
7/7/2012	Assess	Yes	106 Degrees and humid plants are highly stressed.
7/8/2012	Assess	Yes	Rainfall .24"
7/13/2012	Treat	Yes	Passive irrigation started. Two rate structures of SumaGro applied per protocol direction.
7/16/2012	Assess	Yes	96 Degrees and humid plants are stressed.
7/17/2012	Assess	Yes	99 Degrees and humid plants are stressed.
7/18/2012	Assess	Yes	102 Degrees and humid plants are stressed.
7/19/2012	Assess	Yes	99 Degrees and humid plants are stressed.
	Assess	Yes	Good emergence for the germination conditions.
7/22/2012	Assess	Yes	96 Degrees and humid plants are stressed.
7/23/2012	Assess	Yes	102 Degrees and humid plants are stressed.
7/24/2012	Assess	Yes	101 Degrees and humid plants are stressed.
7/25/2012	Assess	Yes	103 Degrees and humid plants are stressed.
7/27/2012	Assess	Yes	96 Degrees and humid plants are stressed.
7/29/2012	Other	Yes	15 DAP root mass evaluations conducted.
7/31/2012	Assess	Yes	100 Degrees and humid plants are stressed.
8/2/2012	Assess	Yes	99 Degrees and humid plants are stressed.
	Assess	Yes	Rainfall .2"
	Other	Yes	Root mass photos at V3-V4
8/7/2012	Assess	Yes	95 Degrees and humid plants are stressed.
8/9/2012	Assess	Yes	96 Degrees and humid plants are stressed.

Date	Task	Done	Description
8/10/2012	Assess	Yes	Cooler temperature today.
8/13/2012	Assess	Yes	Rainfall .24"
8/16/2012	Assess	Yes	Rainfall 1.8"
8/21/2012	Assess	Yes	Still cooler temperatures plants are less stressed
	Assess	Yes	Rainfall .2"
8/27/2012	Assess	Yes	Rainfall .9"
8/31/2012	Assess	Yes	Rainfall .2"
9/1/2012	Assess	Yes	Rainfall 1.22"
9/2/2012	Assess	Yes	Rainfall .59"
9/4/2012	Assess	Yes	Rainfall .94"
9/5/2012	Assess	Yes	Rainfall .71"
9/7/2012	Assess	Yes	Rainfall 2.6"
9/12/2012	Other	Yes	Sugar Brix test conducted.
	Other	Yes	Corn VT root mass collected.
9/14/2012	Assess	Yes	Rainfall .43"
9/17/2012	Assess	Yes	Rainfall .1"
10/9/2012	Assess	Yes	Killer frost, upper portion of plant killed.
10/16/2012	Harvest Date	Yes	Hand harvest ears for analysis.
10/24/2012	Other	Yes	Harvest Stalk samples- awaiting direction from Bio Soil Enhancers for analysis.
11/7/2012	Sampling	Yes	Post harvest soil samples collected

Includes tasks: Treat, Assess, Other



Field Plot Evaluation for SumaGrow on Corn.

12-BSE0212-12

Weather Data

Daily Reports for April 2012

	Maximum Temp (°F)	Minimum Temp (°F)	Days Avg. Temp (°F)	Precipitation (In)	Avg Humidity for April	Wind Speed
1	84	48	69	0	65	9
2	77	52	68	0	73	10
3	84	50	71	0	59	8
4	63	42	56	0.44	79	10
5	60	33	49	0.76	67	14
6	60	29	46	0	63	8
7	64	32	50	0	59	6
8	66	24	55	0	57	10
9	68	22	56	0	38	15
10	56	19	45	0	42	13
11	56	21	42	0	54	7
12	61	26	48	0	56	4
13	60	32	50	0	60	10
14	65	44	58	1.85	86	9
15	75	55	68	0.28	74	18
16	63	43	55	0.12	74	12
17	66	37	54	0	68	3
18	69	38	56	0	67	6
19	73	43	63	0	55	10
20	62	37	52	0.22	77	14
21	56	35	49	0	69	10
22	58	26	46	0	57	11
23	62	26	47	0	51	14
24	63	32	54	0	57	8
25	74	44	60	0	77	9
26	74	29	59	0	66	14
27	61	18	50	0	36	12
28	68	31	58	0.74	67	11
29	64	42	55	0.93	86	7
30	75	55	66	0.11	83	7

Mean:	66	36	55	0.2	64	10
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2012 Growing Season Temperature Average for April =55 °F

Daily Reports for May 2012

	Maximum Temp (°F)	Minimum Temp (°F)	Days Avg. Temp (°F)	Precipitation (In)	Avg Humidity for May	Wind Speed
1	80	50	65	0.31	79	7
2	84	67	76	0	65	11
3	83	67	75	0	72	11
4	83	64	74	0.09	72	8
5	86	62	74	0	68	3
6	86	66	76	0	72	8
7	78	58	68	0	80	9
8	73	56	65	0	64	10
9	70	50	60	0	60	12
10	70	44	57	0	60	2
11	73	47	60	0	61	5
12	76	54	65	0	62	5
13	79	50	65	0	61	9
14	80	52	66	0	46	6
15	81	48	65	0	51	6
16	77	51	64	0	48	12
17	78	44	61	0	44	6
18	83	53	68	0	51	6
19	88	63	76	0	58	7
20	88	63	76	0.3	61	8
21	71	50	61	0	75	11
22	75	47	61	0	56	9
23	80	47	64	0	57	5
24	87	61	74	0	58	13
25	88	72	80	0	62	6
26	91	69	80	0	66	7
27	92	71	82	0	52	7
28	93	73	83	0	54	9
29	84	64	74	0.07	59	6
30	80	54	67	0	50	9
31	68	52	60	0.62	75	10

Mean:	81	57	69	0.0	61	8
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90+

95+

100+

2012 Growing Season Temperature Average for May =69 °F

Daily Reports for June 2012

	Maximum Temp (°F)	Minimum Temp (°F)	Days Avg. Temp (°F)	Precipitation (In)	Avg Humidity for June	Wind Speed
1	64	50	57	0	73	13
2	72	51	62	0	70	7
3	82	58	70	0	64	6
4	71	55	63	0	79	6
5	78	49	64	0	64	8
6	76	49	63	0	63	6
7	80	53	66	0	56	2
8	85	52	69	0	58	2
9	87	61	74	0	54	6
10	88	62	75	0	61	9
11	81	68	75	0	80	6
12	81	56	69	0	59	10
13	81	50	66	0	57	4
14	87	57	72	0	51	7
15	90	59	75	0	55	5
16	92	67	80	0	67	9
17	87	68	78	0	68	5
18	91	73	82	0	59	12
19	92	72	82	0	56	11
20	92	71	82	0	49	9
21	91	65	78	0	63	9
22	85	61	73	0	64	5
23	87	56	72	0	61	3
24	89	62	76	0	62	2
25	86	58	72	0	52	11
26	84	53	69	0	58	6
27	91	59	75	0	48	9
28	102	69	86	0	45	7
29	104	74	89	0	52	6
30	96	72	84	0	60	6

Mean:

86	60	73	0.0	60	7
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90+

95+

100+

2012 Growing Season Temperature Average for June =73 °F

Daily Reports for July 2012

	Maximum Temp (°F)	Minimum Temp (°F)	Days Avg. Temp (°F)	Precipitation (In)	Avg Humidity for July	Wind Speed
1	99	77	88	0.2	60	6
2	100	70	85	0	58	5
3	97	69	83	0	61	6
4	102	73	88	0	58	6
5	104	73	89	0	51	5
6	103	67	85	0	56	4
7	106	75	91	0	55	3
8	94	70	82	0.2	68	9
9	93	62	78	0	54	6
10	93	64	79	0	57	7
11	94	62	78	0	54	6
12	93	69	81	0	49	5
13	92	68	80	0	62	6
14	88	71	80	0	72	6
15	93	71	82	0	67	6
16	96	74	85	0	63	6
17	99	75	87	0	65	6
18	102	76	89	0	58	6
19	99	74	87	0	61	10
20	84	65	75	0	78	9
21	90	60	75	0	66	3
22	96	73	83	0	49	6
23	102	75	89	0	49	8
24	101	79	90	0	54	8
25	103	74	89	0	55	9
26	92	73	83	0	58	11
27	96	66	81	0	56	11
28	87	60	74	0	63	6
29	89	64	77	0	56	5
30	92	68	80	0	60	5
31	100	68	84	0	64	6

Mean:

96	70	83	0.0	59	6
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90+

95+

100+

2012 Growing Season Temperature Average for July =83 °F

Daily Reports For August 2012

	Maximum Temp (°F)	Minimum Temp (°F)	Days Avg. Temp (°F)	Precipitation (In)	Avg Humidity for August	Wind Speed
1	93	64	79	0	58	6
2	99	67	83	.2	59	8
3	90	67	79	0	72	6
4	93	74	84	0	71	9
5	90	64	77	0	62	8
6	89	59	74	0	60	3
7	95	63	79	0	51	4
8	96	65	81	0	48	9
9	90	65	78	0.6	66	7
10	80	58	69	0	70	11
11	82	52	67	0	56	6
12	81	52	67	0	61	2
13	75	62	69	0.2	81	6
14	82	63	73	0	66	7
15	87	62	75	0	65	5
16	90	65	78	1.8	76	8
17	79	55	67	0	64	7
18	79	53	66	0	62	2
19	77	56	67	0	66	1
20	79	53	66	0	66	3
21	83	57	70	0.2	63	3
22	86	56	71	0	57	5
23	90	61	76	0	52	4
24	91	64	78	0	67	6
25	91	73	82	0	46	7
26	87	65	76	0	73	8
27	88	63	76	0.9	73	7
28	87	60	74	0	65	4
29	88	59	74	0	69	3
30	88	63	76	0	59	5
31	86	69	78	0.2	76	7

Mean:	87	62	74	0.1	64	6
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90+

95+

100+

2012 Growing Season Temperature Average for August =74 °F

Daily Reports For September 2012

	Maximum Temp (°F)	Minimum Temp (°F)	Days Avg. Temp (°F)	Precipitation (In)	Avg Humidity for August	Wind Speed
1	83	72	78	1.22	90	9
2	79	72	76	0.59	91	6
3	83	70	77	0.01	85	6
4	88	67	78	0.94	79	2
5	81	64	73	0.71	87	6
6	88	67	78	0	74	4
7	83	63	73	2.6	81	8
8	72	55	64	T	72	11
9	74	54	64	0	67	9
10	75	50	63	0	68	2
11	79	52	66	0	69	7
12	82	59	71	0	65	7
13	81	59	70	0	65	7
14	73	54	64	0.43	66	8
15	73	51	62	0	69	2
16	75	52	64	0	73	4
17	74	57	66	T	84	3
18	64	48	56	0	78	18
19	69	40	55	0	61	9
20	76	54	65	T	52	8
21	75	51	63	0.64	71	7
22	62	43	53	0	70	9
23	64	40	52	0	64	5
24	67	36	52	0	67	7
25	69	54	62	0.91	78	8
26	72	63	68	0.12	90	4
27	75	54	65	T	79	5
28	71	52	62	0	73	8
29	74	45	60	0	71	5
30	72	47	60	0	66	7
Mean:	75	55	65	0.3	74	7

90+

95+

100+

2012 Growing Season Temperature Average for September = 65 °F