

Southern Illinois University

Endigo ZCX Insect Control in Corn - Site 1.

Trial ID: 12-ARC-8E-N140

Location: Agronomy Res. Center

Investigator: Bryan Young

General Trial Information

Study Director: Bryan Young
Investigator: Bryan Young **Title:** Professor

Trial Status: F - one-year/final
Initiation Date: 4-20-12

Trial Location

City: Carbondale
State/Prov.: IL
Postal Code: 62901
Country: USA

Objectives:

Evaluate efficacy of Endigo ZCX and foliar insecticides against silk-clipping and ear-feeding insects and the impact of the insecticides on the crop.

Personnel

Study Director: Bryan Young
Investigator: Bryan Young **Title:** Professor
Affiliation: Southern Illinois University
Address: 1205 Lincoln Drive - AG 176 - MC 4415
Location: Carbondale IL
Postal Code: 62901 **E-mail:** bgyoung@siu.edu
Phone No.: 618-453-7679 **Mobile No.:** 618-713-6471

Crop Description

Crop 1: ZEAMD Zea mays indentata Dent corn
Variety: P1395R **Description:** RR2
BBCH Scale: BCOR **Planting Date:** 4-20-12
Planting Method: SEED Seeded **Rate, Unit:** 28500 S/A
Depth, Unit: 1.5 IN
Row Spacing, Unit: 30 IN

Pest Description

Pest 1 Type: I **Code:** HELIAR Helicoverpa zea
Common Name: Corn earworm

Site and Design

Plot Width, Unit: 10 FT **Site Type:** FIELD field
Plot Length, Unit: 30 FT
Plot Area, Unit: 300 FT2 **Tillage Type:** REDTIL reduced-till
Replications: 4 **Study Design:** RACOB Randomized Complete Block (RCB)

No.	Previous Crop	Year
1.	GLXMA	2011

Maintenance

No.	Maintenance Treatment Name
1.	N 198 LB/A, P205 46 LB/A, K20 120 LB/A
2.	LIME 2 TON/A FALL 2011

Soil Description

% OM: 2.7 **Texture:** SIL SILT LOAM
pH: 5.3
CEC: 11.2

Additional Measured Elements

Element	Quantity	Unit
P1	100	LB/A
K	248	LB/A

Moisture and Weather Conditions

Overall Moisture Conditions: BELNOR below normal
Closest Weather Station: ICN - Carbondale IL **Distance, Unit:** 0.5 MI

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No.	Date	Amount	Unit	Type	Type Description	Interval	Unit	Min Temp	Max Temp	Temp Unit
1.	4-10-12					7	DAY	30.1	79.2	F
2.	4-15-12	0.43	IN	RAIN	rain					
3.	4-16-12	0.39	IN	RAIN	rain					
4.	4-17-12					7	DAY	36.7	75.6	F
5.	4-20-12	0.25	IN	RAIN	rain					
6.	4-22-12	0.09	IN	RAIN	rain					
7.	4-24-12					7	DAY	43.7	80.9	F
8.	4-27-12	0.08	IN	RAIN	rain					
9.	4-30-12	0.05	IN	RAIN	rain					
10.	5-1-12					7	DAY	59.1	91.3	F
11.	5-4-12	0.02	IN	RAIN	rain					
12.	5-7-12	0.08	IN	RAIN	rain					
13.	5-8-12					7	DAY	43.3	79	F
14.	5-15-12					7	DAY	44.9	89.1	F
15.	5-20-12	0.4	IN	RAIN	rain					
16.	5-22-12					7	DAY	45.5	92.8	F
17.	5-29-12					7	DAY	46.3	89.8	F
18.	5-29-12	0.02	IN	RAIN	rain					
19.	5-30-12	0.02	IN	RAIN	rain					
20.	5-31-12	0.16	IN	RAIN	rain					
21.	6-4-12	0.16	IN	RAIN	rain					
22.	6-5-12					7	DAY	48.5	88.8	F
23.	6-11-12	0.62	IN	RAIN	rain					
24.	6-12-12					7	DAY	49.8	91.1	F
25.	6-17-12	0.06	IN	RAIN	rain					
26.	6-19-12					7	DAY	55.4	96.4	F
27.	6-26-12					7	DAY	51.1	105.4	F
28.	7-3-12					7	DAY	71.1	105	F
29.	7-8-12	1.15	IN	RAIN	rain					
30.	7-10-12					7	DAY	65.9	93.9	F
31.	7-14-12	0.11	IN	RAIN	rain					
32.	7-16-12	0.02	IN	RAIN	rain					
33.	7-17-12					7	DAY	60	102.3	F
34.	7-17-12	0.02	IN	RAIN	rain					
35.	7-23-12	0.02	IN	RAIN	rain					
36.	7-24-12					7	DAY	64.1	102.1	F
37.	7-26-12	0.53	IN	RAIN	rain					
38.	7-27-12	0.02	IN	RAIN	rain					
39.	7-29-12	0.27	IN	RAIN	rain					
40.	7-31-12					7	DAY	62.7	97.9	F
41.	8-2-12	0.02	IN	RAIN	rain					
42.	8-3-12	0.02	IN	RAIN	rain					
43.	8-4-12	2.83	IN	RAIN	rain					
44.	8-5-12	2.09	IN	RAIN	rain					
45.	8-7-12					7	DAY	54.1	97.2	F
46.	8-13-12	0.38	IN	RAIN	rain					
47.	8-14-12					7	DAY	51.2	92.5	F
48.	8-16-12	0.66	IN	RAIN	rain					
49.	8-21-12					7	DAY	54.6	94.1	F
50.	8-31-12	1.54	IN	RAIN	rain					

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Application Description

	A
Application Date:	7-3-12
Time of Day:	9:00
Application Method:	Spray
Application Timing:	R1
Application Placement:	BROFOL
Applied By:	NRJ
Air Temperature, Unit:	87 F
% Relative Humidity:	50
Wind Velocity, Unit:	3 MPH
Wind Direction:	W
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	84 F
Soil Moisture:	BELNOR
% Cloud Cover:	10
Next Rain Occurred On:	7-8-12

Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	ZEAMD BCOR
Stage Scale Used:	DESC
Stage Majority, Percent:	R1
Stage Minimum, Percent:	VT
Stage Maximum, Percent:	R1
Height, Unit:	120 IN
Height Minimum, Maximum:	72 120

Pest Stage At Each Application

	A
Pest 1 Code, Type, Scale:	HELIAR I DESC
Stage Majority, Percent:	NA

Application Equipment

	A
Appl. Equipment:	CO2 sprayer
Equipment Type:	BACSPR
Operation Pressure, Unit:	30 PSI
Nozzle Type:	XR
Nozzle Size:	110015
Boom Length, Unit:	7.5 FT
Spray Volume, Unit:	10 GPA

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Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	Rating Timing	Trt-Eval Interval	ZEAMD 9-25-12 Moisture Percent	ZEAMD 9-25-12 Test wt. lb/bu	ZEAMD 9-25-12 Yield bu/A	ZEAMD 7-7-12 Injury Percent	ZEAMD 7-10-12 Injury Percent	ZEAMD 7-17-12 Injury Percent
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code				
1	NONTREATED								14.2 abc	60.4 a	26 a	0 b 0 a 0 a
2	ENDIGO COC (PRIME OIL)	2.06 ZC 100 SL		4.5 fl oz/a 1 % v/v	81 g ai/ha 1 % v/v		R1 R1	A A	13.6 cd	55.2 a	25 a	2 a 0 a 0 a
3	ENDIGO ZCX COC (PRIME OIL)	2.71 ZC 100 SL		4.5 fl oz/a 1 % v/v	107 g ai/ha 1 % v/v		R1 R1	A A	14.8 a	62.5 a	36 a	0 b 0 a 0 a
4	QUILT XCEL WARRIOR II COC (PRIME OIL)	2.2 SC 2.09 CS 100 SL		13 fl oz/a 1.91 fl oz/a 1 % v/v	250 g ai/ha 35 g ai/ha 1 % v/v		R1 R1 R1	A A A	14.9 a	60.5 a	22 a	2 a 2 a 0 a
5	A20007 COC (PRIME OIL)	3.15 ZE 100 SL		13 fl oz/a 1 % v/v	360 g ai/ha 1 % v/v		R1 R1	A A	14.7 ab	62.9 a	29 a	3 a 2 a 0 a
6	QUILT XCEL	2.2 SC		13 fl oz/a	250 g ai/ha		R1	A	13.0 d	53.1 a	21 a	2 a 0 a 0 a
7	COBALT ADVANCED	2.63 EC		32 fl oz/a	740 g ai/ha		R1	A	15.2 a	64.8 a	24 a	3 a 0 a 0 a
8	HEADLINE COBALT ADVANCED COC (PRIME OIL)	2.08 SC 2.63 EC 100 SL		12.1 fl oz/a 32 fl oz/a 1 % v/v	220 g ai/ha 740 g ai/ha 1 % v/v		R1 R1 R1	A A A	14.5 abc	58.7 a	30 a	3 a 2 a 0 a
9	WARRIOR II	2.09 CS		1.91 fl oz/a	35 g ai/ha		R1	A	13.7 bcd	56.0 a	33 a	2 ab 0 a 0 a
10	BESIEGE	1.25 ZC		9 fl oz/a	99 g ai/ha		R1	A	14.6 abc	63.7 a	23 a	3 a 0 a 0 a
LSD (P=.05)							1.11	8.52	18.5	1.6	1.4	0.0
Standard Deviation							0.76	5.71	12.8	1.1	1.0	0.0
CV							5.32	9.56	47.42	56.35	218.49	0.0
Replicate F							0.355	0.492	11.046	0.984	0.310	0.000
Replicate Prob(F)							0.7857	0.6927	0.0001	0.4149	0.8177	1.0000
Treatment F							3.248	1.883	0.594	4.109	2.172	0.000
Treatment Prob(F)							0.0084	0.1248	0.7901	0.0020	0.0577	1.0000

Means followed by same letter do not significantly differ (P=.05, LSD)
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Pest Code Crop Code Rating Date Rating Type Rating Unit Rating Timing Trt-Eval Interval							HELIAR ZEAMD 7-17-12 Control Percent	HELIAR ZEAMD 7-31-12 Control Percent	ZEAMD 7-17-12 Lodging Percent	ZEAMD 7-17-12 Insects /10 Ears	ZEAMD 7-31-12 Insects / 5 Ears		
							14 DA-A	28 DA-A	14 DA-A	14 DA-A	28 DA-A		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code					
1	NONTREATED								85 a	71 a	9 a	1.0 a	1.3 a
2	ENDIGO COC (PRIME OIL)	2.06 100	ZC SL	4.5 fl oz/a 1 % v/v	81 g ai/ha 1 % v/v		R1 R1	A A	83 a	78 a	3 a	0.8 a	1.0 a
3	ENDIGO ZCX COC (PRIME OIL)	2.71 100	ZC SL	4.5 fl oz/a 1 % v/v	107 g ai/ha 1 % v/v		R1 R1	A A	82 a	73 a	3 a	0.5 a	1.5 a
4	QUILT XCEL WARRIOR II COC (PRIME OIL)	2.2 2.09 100	SC CS SL	13 fl oz/a 1.91 fl oz/a 1 % v/v	250 g ai/ha 35 g ai/ha 1 % v/v		R1 R1 R1	A A A	88 a	65 a	4 a	1.3 a	2.0 a
5	A20007 COC (PRIME OIL)	3.15 100	ZE SL	13 fl oz/a 1 % v/v	360 g ai/ha 1 % v/v		R1 R1	A A	81 a	78 a	6 a	0.5 a	1.8 a
6	QUILT XCEL	2.2	SC	13 fl oz/a	250 g ai/ha		R1	A	86 a	80 a	8 a	1.0 a	1.0 a
7	COBALT ADVANCED	2.63	EC	32 fl oz/a	740 g ai/ha		R1	A	94 a	71 a	5 a	0.8 a	2.3 a
8	HEADLINE COBALT ADVANCED COC (PRIME OIL)	2.08 2.63 100	SC EC SL	12.1 fl oz/a 32 fl oz/a 1 % v/v	220 g ai/ha 740 g ai/ha 1 % v/v		R1 R1 R1	A A A	86 a	75 a	9 a	1.3 a	2.3 a
9	WARRIOR II	2.09	CS	1.91 fl oz/a	35 g ai/ha		R1	A	85 a	73 a	5 a	0.3 a	1.5 a
10	BESIEGE	1.25	ZC	9 fl oz/a	99 g ai/ha		R1	A	86 a	74 a	8 a	0.5 a	1.0 a
LSD (P=.05)							14.4	16.4	6.0	1.40	1.61		
Standard Deviation							9.9	11.3	4.1	0.97	1.11		
CV							11.61	15.35	68.47	124.84	71.65		
Replicate F							2.121	2.664	14.063	0.525	3.162		
Replicate Prob(F)							0.1209	0.0680	0.0001	0.6687	0.0407		
Treatment F							0.501	0.549	1.323	0.501	0.802		
Treatment Prob(F)							0.8607	0.8256	0.2714	0.8604	0.6181		

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Pest Code							ZEAMD	ZEAMD	ZEAMD	ZEAMD	ZEAMD		
Crop Code							7-17-12	7-31-12	7-17-12	7-17-12	7-17-12		
Rating Date							Ears Damgd	Ears Damgd	Damgd Kern	Damgd Kern	Disease		
Rating Type							Percent	Percent	/10 Ears	cm2	Percent		
Rating Unit							14 DA-A	28 DA-A	14 DA-A	14 DA-A	14 DA-A		
Rating Timing													
Trt-Eval Interval													
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code					
1	NONTREATED								28 a	70 a	9.5 a	3.8 a	0 a
2	ENDIGO COC (PRIME OIL)	2.06 100	ZC SL	4.5 fl oz/a 1 % v/v	81 g ai/ha 1 % v/v		R1 R1	A A	28 a	60 a	14.8 a	5.8 a	0 a
3	ENDIGO ZCX COC (PRIME OIL)	2.71 100	ZC SL	4.5 fl oz/a 1 % v/v	107 g ai/ha 1 % v/v		R1 R1	A A	28 a	65 a	5.8 a	2.3 a	0 a
4	QUILT XCEL WARRIOR II COC (PRIME OIL)	2.2 2.09 100	SC CS SL	13 fl oz/a 1.91 fl oz/a 1 % v/v	250 g ai/ha 35 g ai/ha 1 % v/v		R1 R1 R1	A A A	23 a	90 a	1.0 a	0.4 a	0 a
5	A20007 COC (PRIME OIL)	3.15 100	ZE SL	13 fl oz/a 1 % v/v	360 g ai/ha 1 % v/v		R1 R1	A A	30 a	55 a	4.0 a	1.6 a	0 a
6	QUILT XCEL	2.2	SC	13 fl oz/a	250 g ai/ha		R1	A	20 a	55 a	11.8 a	4.7 a	0 a
7	COBALT ADVANCED	2.63	EC	32 fl oz/a	740 g ai/ha		R1	A	13 a	70 a	0.0 a	0.0 a	0 a
8	HEADLINE COBALT ADVANCED COC (PRIME OIL)	2.08 2.63 100	SC EC SL	12.1 fl oz/a 32 fl oz/a 1 % v/v	220 g ai/ha 740 g ai/ha 1 % v/v		R1 R1 R1	A A A	23 a	60 a	10.0 a	3.8 a	0 a
9	WARRIOR II	2.09	CS	1.91 fl oz/a	35 g ai/ha		R1	A	25 a	70 a	5.3 a	2.0 a	0 a
10	BESIEGE	1.25	ZC	9 fl oz/a	99 g ai/ha		R1	A	28 a	70 a	0.0 a	0.0 a	0 a
LSD (P=.05)							24.0	30.0	15.87	6.22	0.0		
Standard Deviation							16.6	20.6	10.93	4.29	0.0		
CV							68.26	31.05	176.37	176.01	0.0		
Replicate F							2.467	3.276	0.612	0.567	0.000		
Replicate Prob(F)							0.0837	0.0362	0.6130	0.6412	1.0000		
Treatment F							0.386	0.993	0.889	0.888	0.000		
Treatment Prob(F)							0.9314	0.4685	0.5476	0.5478	1.0000		

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Pest Code							ZEAMD	ZEAMD	ZEAMD
Crop Code							7-17-12	7-17-12	9-6-12
Rating Date							Reduc	Barren	Senescence
Rating Type							Vigor	Ears	Percent
Rating Unit							Percent	/10 Ears	Percent
Rating Timing									
Trt-Eval Interval							14 DA-A	14 DA-A	EOS
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code	
1	NONTREATED								0 a
2	ENDIGO COC (PRIME OIL)	2.06 100	ZC SL	4.5 fl oz/a 1 % v/v	81 g ai/ha 1 % v/v		R1 R1	A A	0 a
3	ENDIGO ZCX COC (PRIME OIL)	2.71 100	ZC SL	4.5 fl oz/a 1 % v/v	107 g ai/ha 1 % v/v		R1 R1	A A	0 a
4	QUILT XCEL WARRIOR II COC (PRIME OIL)	2.2 2.09 100	SC CS SL	13 fl oz/a 1.91 fl oz/a 1 % v/v	250 g ai/ha 35 g ai/ha 1 % v/v		R1 R1 R1	A A A	5 a
5	A20007 COC (PRIME OIL)	3.15 100	ZE SL	13 fl oz/a 1 % v/v	360 g ai/ha 1 % v/v		R1 R1	A A	3 a
6	QUILT XCEL	2.2	SC	13 fl oz/a	250 g ai/ha		R1	A	3 a
7	COBALT ADVANCED	2.63	EC	32 fl oz/a	740 g ai/ha		R1	A	5 a
8	HEADLINE COBALT ADVANCED COC (PRIME OIL)	2.08 2.63 100	SC EC SL	12.1 fl oz/a 32 fl oz/a 1 % v/v	220 g ai/ha 740 g ai/ha 1 % v/v		R1 R1 R1	A A A	3 a
9	WARRIOR II	2.09	CS	1.91 fl oz/a	35 g ai/ha		R1	A	3 a
10	BESIEGE	1.25	ZC	9 fl oz/a	99 g ai/ha		R1	A	0 a
LSD (P=.05)							7.1	1.96	10.8
Standard Deviation							4.9	1.35	7.5
CV							243.43	68.26	8.75
Replicate F							0.844	19.563	10.374
Replicate Prob(F)							0.4820	0.0001	0.0001
Treatment F							0.656	0.808	0.763
Treatment Prob(F)							0.7398	0.6126	0.6507

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Trial Comments

1. Protocol: Syngenta (751 2012).
2. Ratings: CI at 3 and 7 DAT, continue if injury persists.
Insect counts (insects per 10 ears) at 14 DAT;
Percent insect control at 14 and 28 DAT; Percent ear damage (cm² damaged kernels) at 14 DAT (R3-R4);
Percent disease severity, and percent vigor at 14 DAT.
Percent delayed senescence when nontreated is at 80% brown tissue.
3. Application timing is threshold when the insect population is increasing or R1, target Japanese beetles.
4. Blanket POST application of Roundup Powermax (22 fl oz/A) + Degree Xtra (3 qt/A) + Aatrex (1 qt/A) was applied to all plots 10 ft wide on 5-10-12.
5. Yield if possible, destroy grain from non-registered products for corn use.
6. HELIAR = *Helicoverpa zea*, Corn earworm.
HELIAR, Control, Percent = Control based on number of insects rather than compared to the nontreated.
Insects, /10 Ears = Number of insects per 10 ears. Insects, / 5 Ears = Number of insects per 5 ears.
Ears Damgd, Percent = Percentage of ears damaged, tip or kernel feeding.
Damgd Kern, /10 Ears = Number of damaged kernels per 10 ears.
Damgd Kern, cm² = Damaged kernels, square centimeters per 10 ears.
Reduc Vigor = Reduction in vigor compared to the nontreated.
Barren Ears, /10 Ears, Number of ears that failed to pollinate due to hot dry weather per 10 ears.
Senescence = Percentage of plant with brown tissue when the nontreated was at 90% brown tissue.
7. Harvested 9-25-12, (2) 30 inch rows by 27 ft.