

Southern Illinois University

Endigo ZCX Insect Control in Corn - Site 2.

Trial ID: 12-Syngenta-Cowden
 Location: Cowden, IL

Investigator: Bryan Young

General Trial Information

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

Trial Status: F - one-year/final
Initiation Date: 4-24-12

Trial Location

City: Cowden **Latitude of LL Corner** °: 39.261511 N
State/Prov.: IL **Longitude of LL Corner** °: 88.915578 W
Postal Code: 62422 **Altitude of LL Corner, Unit:** 574.00 FT
Country: USA
Angle y-axis to North °: 0.00

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: Syngenta N68B
BCH Scale: BCOR **Planting Date:** 4-24-12
Planting Method: SEEDED Seeded
Row Spacing, Unit: 30 IN

Pest Description

Pest 1 Type: I **Code:** HELIAR Helicoverpa zea
Common Name: Corn earworm
Pest 2 Type: I **Code:** POPIJA Popillia japonica
Common Name: Japanese beetle

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 L Randomized Complete Block (RCB)

No.	Year
1.	2011

Soil Description

% Sand: 10.3 **% OM:** 4.19 **Texture:** SIL SILT LOAM
% Silt: 73.8 **pH:** 5.7 **Soil Name:** Wynoose / Parke
% Clay: 15.9 **CEC:** 13.74

Additional Measured Elements

Element	Quantity	Unit
P1	84	LB/A
K	248	LB/A

Moisture and Weather Conditions

Overall Moisture Conditions: BELNOR below normal
Closest Weather Station: COLES CO MEMO AIRPORT (53802) **Distance, Unit:** 33 MI

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No.	Date	Amount	Unit	Type	Type Description	Interval	Unit	Min Temp	Max Temp	Temp Unit
1.	4-1-12					7	DAY	32	84	F
2.	4-1-12	0.02	IN	RAIN	rain					
3.	4-4-12	0.44	IN	RAIN	rain					
4.	4-5-12	0.76	IN	RAIN	rain					
5.	4-8-12					7	DAY	27	68	F
6.	4-13-12	0.03	IN	RAIN	rain					
7.	4-14-12	1.85	IN	RAIN	rain					
8.	4-15-12					7	DAY	41	75	F
9.	4-15-12	0.28	IN	RAIN	rain					
10.	4-16-12	0.12	IN	RAIN	rain					
11.	4-20-12	0.22	IN	RAIN	rain					
12.	4-22-12					7	DAY	32	74	F
13.	4-28-12	0.74	IN	RAIN	rain					
14.	4-29-12					7	DAY	46	86	F
15.	4-29-12	0.93	IN	RAIN	rain					
16.	4-30-12	0.11	IN	RAIN	rain					
17.	5-1-12	0.31	IN	RAIN	rain					
18.	5-4-12	0.09	IN	RAIN	rain					
19.	5-6-12					7	DAY	44	86	F
20.	5-13-12					7	DAY	44	88	F
21.	5-20-12					7	DAY	47	91	F
22.	5-20-12	0.3	IN	RAIN	rain					
23.	5-27-12					7	DAY	50	93	F
24.	5-29-12	0.07	IN	RAIN	rain					
25.	5-31-12	0.62	IN	RAIN	rain					
26.	6-1-12	0.02	IN	RAIN	rain					
27.	6-3-12					7	DAY	49	87	F
28.	6-4-12	0.08	IN	RAIN	rain					
29.	6-10-12					7	DAY	50	92	F
30.	6-11-12	0.13	IN	RAIN	rain					
31.	6-16-12	0.04	IN	RAIN	rain					
32.	6-17-12					7	DAY	56	92	F
33.	6-21-12	0.27	IN	RAIN	rain					
34.	6-24-12					7	DAY	53	104	F
35.	7-1-12					7	DAY	67	106	F
36.	7-8-12					7	DAY	62	94	F
37.	7-14-12	0.02	IN	RAIN	rain					
38.	7-15-12					7	DAY	60	102	F
39.	7-22-12					7	DAY	60	103	F
40.	7-29-12					7	DAY	64	100	F
41.	8-2-12	0.54	IN	RAIN	rain					
42.	8-5-12					7	DAY	52	96	F
43.	8-8-12	0.48	IN	RAIN	rain					
44.	8-9-12	0.56	IN	RAIN	rain					
45.	8-12-12					7	DAY	52	90	F
46.	8-13-12	0.24	IN	RAIN	rain					
47.	8-16-12	1.29	IN	RAIN	rain					
48.	8-19-12					7	DAY	53	91	F
49.	8-20-12	0.05	IN	RAIN	rain					
50.	8-26-12					7	DAY	59	88	F
51.	8-26-12	0.03	IN	RAIN	rain					
52.	8-27-12	0.5	IN	RAIN	rain					
53.	8-31-12	0.18	IN	RAIN	rain					

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Application Description

	A
Application Date:	7-6-12
Time of Day:	10:15
Application Method:	Spray
Application Timing:	R1
Application Placement:	BROFOL
Applied By:	NRJ
Air Temperature, Unit:	98 F
% Relative Humidity:	41
Wind Velocity, Unit:	2 MPH
Wind Direction:	N
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	80 F
Soil Moisture:	BELNOR
% Cloud Cover:	5
Next Rain Occurred On:	7-14-12

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
Pest 2 Code, Type, Scale:	POPIJA 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 8-29-12 Moisture Percent	ZEAMD 8-29-12 Yield bu/A	ZEAMD 7-9-12 Injury Percent	ZEAMD 7-13-12 Injury Percent	ZEAMD 7-20-12 Injury Percent	INSECTS ZEAMD 7-20-12 Control Percent	INSECTS ZEAMD 8-3-12 Control Percent		
							54 DA-A	54 DA-A	3 DA-A	7 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								22.1 a	41 a	0 a	0 a	0 a	89 b	96 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	20.8 a	40 a	0 a	0 a	0 a	96 a	96 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	21.3 a	43 a	0 a	0 a	0 a	98 a	99 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	18.5 a	50 a	0 a	0 a	0 a	96 a	99 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	21.0 a	39 a	1 a	0 a	0 a	93 ab	99 a
6	QUILT XCEL	2.2	SC	13 fl oz/a	250 g ai/ha		R1	A	21.2 a	38 a	0 a	0 a	0 a	80 c	99 a
7	COBALT ADVANCED	2.63	EC	32 fl oz/a	740 g ai/ha		R1	A	18.9 a	45 a	0 a	0 a	0 a	97 a	96 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	22.8 a	33 a	0 a	0 a	0 a	94 ab	99 a
9	WARRIOR II	2.09	CS	1.91 fl oz/a	35 g ai/ha		R1	A	20.4 a	52 a	0 a	0 a	0 a	95 ab	99 a
10	BESIEGE	1.25	ZC	9 fl oz/a	99 g ai/ha		R1	A	21.7 a	52 a	0 a	0 a	0 a	94 ab	99 a
LSD (P=.05)							4.26	25.7	0.7	0.0	0.0	7.1	5.0		
Standard Deviation							2.93	17.7	0.5	0.0	0.0	4.9	3.4		
CV							14.05	40.68	632.46	0.0	0.0	5.28	3.52		
Replicate F							2.686	4.471	1.000	0.000	0.000	1.479	3.714		
Replicate Prob(F)							0.0673	0.0117	0.4079	1.0000	1.0000	0.2425	0.0239		
Treatment F							0.816	0.527	1.000	0.000	0.000	4.604	0.963		
Treatment Prob(F)							0.6066	0.8412	0.4635	1.0000	1.0000	0.0009	0.4914		

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	HELIAZ	POPIJA	INSECTS	ZEAMD	ZEAMD							
Crop Code	ZEAMD	ZEAMD	ZEAMD	ZEAMD	ZEAMD							
Rating Date	7-20-12	7-20-12	8-3-12	7-20-12	8-3-12							
Rating Type	Insects	Insects	Insects	Ears Damgd	Ears Damgd							
Rating Unit	/10 Ears	/10 Ears	/ 5 Ears	Percent	Percent							
Rating Timing												
Trt-Eval Interval	14 DA-A	14 DA-A	28 DA-A	14 DA-A	28 DA-A							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Other Rate Rate Unit	Growth Stage	Appl Code					
1	NONTREATED							0.3 a	0.5 a	0.0 a	3 a	5 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	0.3 a	0.3 a	0.0 a	3 a	5 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	0.0 a	0.3 a	0.0 a	0 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	0.3 a	0.5 a	0.0 a	3 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	0.0 a	0.8 a	0.0 a	3 a	0 a
6	QUILT XCEL	2.2	SC	13 fl oz/a	250 g ai/ha	R1	A	0.0 a	0.0 a	0.0 a	3 a	0 a
7	COBALT ADVANCED	2.63	EC	32 fl oz/a	740 g ai/ha	R1	A	0.0 a	0.5 a	0.0 a	0 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	0.5 a	0.5 a	0.0 a	3 a	0 a
9	WARRIOR II	2.09	CS	1.91 fl oz/a	35 g ai/ha	R1	A	0.0 a	0.8 a	0.0 a	0 a	0 a
10	BESIEGE	1.25	ZC	9 fl oz/a	99 g ai/ha	R1	A	0.0 a	0.8 a	0.0 a	3 a	0 a
LSD (P=.05)								0.61	1.13	0.00	6.0	7.2
Standard Deviation								0.42	0.78	0.00	4.1	4.9
CV								336.43	164.45	0.0	235.22	328.17
Replicate F								0.895	5.067	0.000	1.328	3.714
Replicate Prob(F)								0.4563	0.0065	1.0000	0.2859	0.0239
Treatment F								0.707	0.405	0.000	0.344	0.963
Treatment Prob(F)								0.6976	0.9213	1.0000	0.9513	0.4914

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Pest Code	Crop Code	Rating Date	Rating Type	Rating Unit	Rating Timing	Trt-Eval Interval	ZEAMD 7-20-12 Damgd Kern /10 Ears	ZEAMD 7-20-12 Damgd Kern cm2	ZEAMD 7-20-12 Silk Clip Percent	ZEAMD 7-20-12 Disease Percent	ZEAMD 7-20-12 Reduc Vigor Percent	ZEAMD 8-13-12 Senescence Percent		
							14 DA-A	14 DA-A	14 DA-A	14 DA-A	14 DA-A	38 DA-A		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate Unit	Other Rate	Other Rate Unit	Growth Stage	Appl Code						
1	NONTREATED								0.0 a	0.00 a	20 b	0 a	0 a	55 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	0.0 a	0.00 a	5 c	0 a	3 a	64 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	0.0 a	0.00 a	3 c	0 a	5 a	56 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	0.0 a	0.00 a	5 c	0 a	5 a	58 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	0.8 a	0.21 a	8 bc	0 a	0 a	63 a
6	QUILT XCEL	2.2	SC	13 fl oz/a	250 g ai/ha		R1	A	0.0 a	0.00 a	38 a	0 a	3 a	65 a
7	COBALT ADVANCED	2.63	EC	32 fl oz/a	740 g ai/ha		R1	A	0.0 a	0.00 a	5 c	0 a	0 a	79 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	0.0 a	0.00 a	10 bc	0 a	3 a	56 a
9	WARRIOR II	2.09	CS	1.91 fl oz/a	35 g ai/ha		R1	A	0.0 a	0.00 a	10 bc	0 a	0 a	64 a
10	BESIEGE	1.25	ZC	9 fl oz/a	99 g ai/ha		R1	A	0.0 a	0.00 a	10 bc	0 a	0 a	74 a
LSD (P=.05)							0.69	0.196	14.9	0.0	4.8	29.1		
Standard Deviation							0.47	0.135	10.3	0.0	3.3	20.0		
CV							632.46	632.46	91.12	0.0	189.68	31.69		
Replicate F							1.000	1.000	2.181	0.000	3.857	2.623		
Replicate Prob(F)							0.4079	0.4079	0.1134	1.0000	0.0203	0.0710		
Treatment F							1.000	1.000	4.137	0.000	1.538	0.612		
Treatment Prob(F)							0.4635	0.4635	0.0020	1.0000	0.1851	0.7757		

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Trial Comments

1. Protocol: Syngenta (752 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 CRW.
4. Yield if possible, destroy grain from non-registered products for corn use.
5. HELIAR = Corn ear worm. POPIJA = Japanese beetle.
Insects, /10 Ears = Number of insects per 10 ears. Insects, / 5 Ears = Number of insects per 5 ears.
Insects, Control, Percent = Control based on number of insects rather than compared to the nontreated.
Damgd Kern, /10 Ears = Number of damaged kernels per 10 ears.
Damgd Kern, cm² = Damaged kernels, square centimeters per 10 ears.
Silk Clip = Silk clipping, Japanese beetles.
Reduc Vigor = Reduction in vigor compared to the nontreated.
Senescence = Percentage of plant with brown tissue when nontreated was at 55% (variable at 30, 75, 30, and 85% in reps 1 to 4) brown tissue.
6. Low yield overall and especially plots 103 and 108 was due to hot dry conditions and low ear production at pollination.
Missing data at 28 DAT and yield for plot 104 was due to destructive sampling of ears at 14 DAT.
Destructive sampling at 14 DAT was removal of 10 ears per plot.
7. Harvested 8-29-12 (2) 30 inch rows by 25 ft.