

**REPORT – MICHIGAN STATE UNIVERSITY
2009 FIELD SEASON**

Western bean cutworm in dry bean - larval infestation trial

Trial Location: Michigan / Montcalm County / Thorlund Brothers Farm

Cooperators: M. Jewett, C. DiFonzo, Fred Springborn, Greg Varner
- Michigan State University, 243 Natural Science Bldg, East Lansing, MI 48824
- Phone 517-353-5328 / fax 517-353-4995

Funding: Project GREEN

Crop/Pest: Dry bean / Western Bean Cutworm
Variety: California early light red kidney (CAL-ELRK)
Planting Date/Rate: 15 June 2009 / 59,285 seeds per acre

Treatments: 0, 2, 4, or 8 larvae foot of row
[2 larvae per foot of row is the current threshold for irrigated beans in Nebraska]
Dry bean plots were infested with varying numbers of WBC larvae, hatched from egg masses and fed until they reached the 2nd instar. Larvae were placed on upper leaves of the beans, but they rapidly moved down the plant. Alleys were rototilled around each plot to reduce plot-to-plot larval movement.

Plot layout: 4 reps, RCBD, plots 5 feet (2 rows) x 20 feet

Fertilizer Application: 200 lbs 12-12-12 at planting

Pesticide Applications (Rate / acre):

- ◆ 15 June, Eptam 7E (1.25 qt) + Sonalan HFP (1.0 pt) + Intro (2.0 qts) - all incorporated
- ◆ 7 July, Basagran (12 oz.) + Reflex (1pt) + Crop oil (1pt)
- ◆ 7 July, Dimethoate (16 oz) for potato leaf hopper control

Trial infestation and harvest

- ◆ 6 August: Infested dry beans with WBC larvae
- ◆ 24 Sept: Harvested center two rows of each plot. Details below.

At the end of the season, two center rows of each plot were harvested. Plants in one row were pulled, run through an Almaco stationary thresher, and weights and moistures taken. A 250 g sub-sample subsample was collected to determine % damaged beans. The percentage was multiplied by the total plot weight, and the resulting number subtracted from the total plot weigh to provide an estimate of marketable yield in lbs. This is similar to what an elevator would do to estimate the percentage of damaged beans (pick) in a commercial shipment.

The second row was hand harvested and taken back to the laboratory to determine % damaged plants. Damaged and undamaged pods were counted. The damaged pods were removed from stems by hand, and run through a small table-top roller thresher [Taylor Manufacturing Co.] to determine the number and weight of damaged versus undamaged beans. The undamaged beans (still on the stems) were run through the Almaco thresher to get total weight. Data was analyzed using SAS version 9.1.

Weather Data: Station located at the MAWN, Montcalm research station ~15 mile distant

Month	Total Precipitation Inches
April	3.9
May	2.2
June	2.4
July	2.1
August	4.7
September	1.5

Damage and Yield, WBC larval trial, 2009

# larvae per row ft	% pods damaged	% beans damaged by weight		Yield lbs/acre
		hand- harvested sample	Machine- harvested sub-sample	
0	3 a	0.4 a	0.5 a	2196 a
2	8 a	0.6 ab	0.9 a	2528 a
4	16 b	1.1 bc	0.8 a	2329 a
8	22 b	1.2 c	1.0 a	2400 a

In columns, numbers followed by different letters are significantly different at $p < 0.05$, LSD.

Results and Discussion:

As in our egg mass study, a small amount of damage was found in the '0' plots which were not infested with larvae. This could be the result of interplot movement (despite the rototilled borders) or natural background infestation. At 4 larvae per foot, there were significantly more damaged pods (16%) and beans (1.1%) than the '0' treatment. Although there were no significant differences in lbs of yield, once again there was a difference in quality that would cause an elevator to have to spend money and time screening of commercial loads for damage.