**(F)**

**CORN:** *Zea mays* L. 'Novartis N71M-GT/CB/LL'

# GRANULAR AND LIQUID INSECTICIDE EVALUATIONS FOR LARVAL CORN ROOTWORM CONTROL, 2008

**Terry A. DeVries**

South Central Agricultural Laboratory

University of Nebraska-Lincoln

842 Road 313, P.O. Box 66

Clay Center, NE 68933

Phone: (402) 762-4405

Fax: (402) 762-4411

Email: tdevries1@unl.edu

**Robert J. Wright**

Department of Entomology

University of Nebraska-Lincoln

202 Plant Industry Bldg.

Lincoln NE 68583-0816

Email: rwright2@unl.edu

Western corn rootworm (WCR): *Diabrotica virgifera virgifera* LeConte

Northern corn rootworm (NCR): *Diabrotica barberi* Smith and Lawrence

Planting time soil insecticide screening trials were conducted near Clay Center, NE to evaluate their effectiveness for larval corn rootworm control in field corn. Local population consists predominately of WCR (>95% of total). Trial site was late-planted corn (insecticide free) during 2007. Experimental design was a RCB with 4 replicates. Plot size was 2 rows x 145 ft length (N-S orientation) in 30-inch row spacing. Soil type was a Crete silt loam. 'Novartis N71M-GT/CB/LL' hybrid field corn was planted on 01 May 2008 with a 2-row 7100 JD Maximerge planter with finger pickup seed units. A west-northwest wind @ 12-16 mph occurred at planting. Granular insecticides were applied via standard insecticide boxes in either a 7 inch band over the open seed furrow and in front of the press wheels (TB) or directed into the open seed furrow (IF). A $CO_2$ pressurized sprayer mounted on the planter was used to apply liquid insecticides. Microtubes positioned between the disc openers were used to direct an in-furrow spray solution of 5 gpa water (MTIF) or liquid insecticides were applied in a 7 inch band over the open seed furrow and in front of the press wheels in 5 gpa water (LTB). Plant populations were evaluated on 21 May. The total number of plants per plot was recorded and converted to plants per acre. Corn rootworm egg hatch was first observed on 02 Jun. The total number of lodged plants per plot was recorded on 09 Jul and converted to % root lodging. Larval feeding damage was evaluated on 15 Jul. Five randomly selected plants were dug from each plot, washed, and rated using the Iowa State 0-3 scale (0 = no feeding, 1 = one node of roots pruned to within 1.5 inches of the stalk, 2 = two nodes of roots pruned to within 1.5 inches of the stalk, 3 = 3 or more nodes of roots pruned to within 1.5 inches of the stalk). The total number of lodged plants per plot was

also recorded on 25 Sept and converted to % root lodging. Plots were machine harvested on 02 Nov. Percent moisture and lbs of grain were recorded and corrected to 56 lbs/bu @ 15% moisture. Data were analyzed by ANOVA with mean separation using differences of least square means (P = 0.05).

From planting (01 May) to larval feeding damage evaluation (15 Jul), precipitation totaled 11.77 inches. Larval rootworm densities were high, with mean root injury ratings in the untreated check averaging 1.52. All treatments tested significantly reduced larval corn rootworm root damage and both early and late season root lodging compared to the untreated check. Lorsban 15G TB did not perform as well statistically as the other insecticide treatments tested based on root injury ratings. Yield levels and plant populations were not significantly enhanced with a planting time insecticide application.

| Treatment/ Formulation | Rate-amt form/1000 row ft | Placement[1] | Plants/ Acre[3] | Early Season % Root Lodging[2] | Late Season % Root Lodging[2] | Root Injury Rating[2] | Yield Bu/Acre[3] |
|---|---|---|---|---|---|---|---|
| Aztec 2.1G | 6.7 oz | IF | 29,709 | 0.1 a | 0.0 a | 0.18 a | 197.0 |
| Force CS | 0.46 fl oz | LTB | 29,918 | 0.2 a | 0.3 a | 0.30 ab | 197.8 |
| Force CS | 0.46 fl oz | MTIF | 29,509 | 0.1 a | 0.1 a | 0.38 ab | 193.1 |
| Aztec 2.1G | 6.7 oz | TB | 29,975 | 0.1 a | 0.6 a | 0.41 ab | 195.0 |
| Force 3G | 4 oz | IF | 29,944 | 0.1 a | 0.1 a | 0.44 ab | 198.0 |
| Force 3G | 4 oz | TB | 30,510 | 0.1 a | 0.4 a | 0.54 b | 195.3 |
| Capture LFR | 0.49 fl oz | LTB | 30,597 | 0.2 a | 0.6 a | 0.59 b | 194.6 |
| Capture LFR | 0.49 fl oz | MTIF | 29,769 | 0.0 a | 0.2 a | 0.62 b | 200.7 |
| Lorsban 15G | 8 oz | TB | 29,927 | 0.1 a | 7.2 a | 1.11 c | 191.2 |
| Untreated | ---------- | ------- | 29,636 | 2.6 b | 22.2 b | 1.52 d | 191.6 |
| | P | | 0.0509 | 0.0241 | 0.0005 | <0.0001 | 0.5582 |

[1]IF, granular insecticide directed into the open seed furrow; LTB, liquid insecticide applied in a 7 inch band over the open seed furrow and in front of the press wheels in a 5 gpa water solution; MTIF, liquid insecticide applied in-furrow with microtubes positioned between the disc openers in a 5 gpa water solution; TB, granular insecticide applied in a 7-inch band over the open seed furrow and in front of the press wheels.

[2]Means in column followed by the same lowercase letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

[3]Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05

**Part II. Materials Tested for Arthropod Management**

**(F)**

**CORN:** *Zea mays* L. 'Novartis N71M-GT/CB/LL'

**GRANULAR AND LIQUID INSECTICIDE EVALUATIONS FOR LARVAL CORN ROOTWORM CONTROL, 2008**

**Terry DeVries**

University of Nebraska-Lincoln

South Central Agricultural Laboratory

842 Road 313, P.O. Box 66

Clay Center, NE 68933

Phone: (402) 762-4405

Fax: (402) 762-4411

Email: tdevries1@unl.edu

| **Brand Name** | **Formulation** | **Common Name** | **Composition** | **Manufacturer** |
|---|---|---|---|---|
| Aztec | 2.1G | tebupirimphos and cyfluthrin | (*RS*)-[*O*-(2-*tert*-butylpyrimidin-5-yl) *O*-ethyl *O*-isopropyl phosphorothioate] AND (*RS*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*RS*,3*RS*;1*RS*,3*SR*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate | Bayer AG Agriculture Division P.O. Box 4913, Hawthorn Road Kansas City, MO 64120 |
| Force | CS | tefluthrin | 2,3,5,6-tetrafluoro-4-methylbenzyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate | Syngenta Crop Protection, Inc. P. O. Box 18300 Greensboro, NC 27409 |
| Force | 3G | tefluthrin | 2,3,5,6-tetrafluoro-4- | Syngenta Crop |

| | | | | |
|---|---|---|---|---|
| | | | methylbenzyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate | Protection, Inc.<br>P. O. Box 18300<br>Greensboro, NC 27409 |
| Capture | LFR | bifenthrin | 2-methylbiphenyl-3-ylmethyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate | FMC Corporation<br>1735 Market Street<br>Philadelphia, PA 19103 |
| Lorsban | 15G | chlorpyrifos | *O*,*O*-diethyl *O*-3,5,6-trichloro-2-pyridyl phosphorothioate | Dow AgroSciences LLC<br>9330 Zionsville Road<br>Indianapolis, IN 46268 |