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**CORN:** *Zea mays* L. ' Pioneer P1173HR'

# EVALUATION OF LIQUID INSECTICIDES AT PLANTING FOR LARVAL CORN ROOTWORM CONTROL, 2012

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

Liquid insecticides were applied at planting time to evaluate their effectiveness for larval corn rootworm (CRW) control in field corn near Clay Center, NE during 2012. Trial site was late-planted corn and pumpkins (insecticide free) during 2011. Experimental design was a RCB with 4 replicates. Plot size was 2 rows x 142 ft length in 30-inch row spacing. Soil type was a Crete silt loam. 'Pioneer P1173HR' (contains Herculex I insect traits) corn hybrid was planted on 23 Apr with a 2-row JD 7100 Maximerge planter with finger pickup seed units. The corn hybrid received a seed-applied treatment of Pioneer Premium Seed Treatment 250 (thiamethoxam @ 0.25 mg/kernel). A southeast wind @ < 10 mph occurred at planting. Liquid insecticides were applied in a 5 GPA water solution via a $CO_2$ pressurized system and directed into the open seed furrow (IF). Initial CRW egg hatch occurred on approximately 08 May. Plant populations were evaluated on 09 May. The total number of plants per plot was recorded and converted to plants per acre. The total number of dead plants per plot was recorded on 28 Jun. Larval feeding damage was evaluated on 02 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 pre-harvest root lodged plants per plot was recorded on 18 Sept. Plots were machine harvested on 12 Oct. Percent moisture and lbs of grain were recorded and corrected to 56 lbs/bu @ 15.5% moisture. Data were analyzed by PROC MIXED with mean separation using differences of least square means (P = 0.05).

From planting (23 Apr) to larval feeding damage evaluation (02 Jul), rainfall totaled 8.55 inches and overhead irrigation, 1.57 inches. Larval CRW densities were moderately high, with mean

root injury ratings (Iowa 0-3 scale) in the untreated check, averaging 1.62. Belay treatments significantly enhanced larval corn rootworm protection based on root injury ratings compared to the untreated check. All treatments significantly reduced the number of dead plants per plot due to CRW larval feeding compared to the untreated check. Grain yield levels were not statistically enhanced by the application of a liquid insecticide at planting compared to the untreated check.

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| Treatment[a]/ Formulation | Rate-amt form/acre | Placement | Plants/ Acre[c] | No. of Dead Plants[b] | Root Injury Rating[b] | No. of Root Lodged Plants[c] | Yield Bu/Acre[c] |
|---|---|---|---|---|---|---|---|
| Belay | 10.9 oz | IF | 30,268 | 0.0 a | 0.50 a | 89.8 | 213.3 |
| Belay | 5.5 oz | IF | 30,247 | 0.3 a | 0.77 ab | 173.3 | 212.1 |
| Capture LFR | 8.5 oz | IF | 29,661 | 0.3 a | 1.31 bc | 127.0 | 215.9 |
| Untreated | | | 29,870 | 11.0 b | 1.62 c | 189.3 | 192.9 |
| | | P | 0.2053 | 0.0375 | 0.0093 | 0.3685 | 0.1391 |

[a]Liquid insecticides were applied in a 5 GPA water solution and directed into the open seed furrow.

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

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

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| **Brand Name** | **Formulation** | **Common Name** | **Composition** | **Manufacturer** |
|---|---|---|---|---|
| Belay | | clothianidin | (E)-1-(2-chloro-1,3-thiazol-5-ylmethyl)-3-methyl-2-nitroguanidine | Valent U.S.A. Corporation<br>1600 Riviera Avenue, Suite 200<br>Walnut Creek, CA 94596-8025 |
| 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<br>1735 Market Street<br>Philadelphia, PA 19103 |