

## INTEGRATED APPROACH NEEDED FOR WESTERN CORN ROOTWORM

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**Realize optimum corn yields through an integrated management approach for Western Corn Rootworms.**

Effective management of Western Corn Rootworm (WCR) begins with an integrated approach that emphasizes stewardship of existing technology. The rotation to non-host crops can be an effective tool for managing corn rootworms but often is not a practical option in some corn growing areas. *Bacillus thuringiensis* (Bt) traited corn has been effective and highly successful. Unfortunately, planting of pyramided traited Bt corn has been overly relied on and now the protection provided by this technology is not as strong as it first was. To help preserve Bt traited technology corn, the incorporation of other strategies is needed, such as using soil-applied insecticides at planting and foliar insecticide treatments targeted at adult WCR.

## SOIL-APPLIED INSECTICIDE TREATMENTS FOR PROTECTION AGAINST WCR LARVAL FEEDING: CAPTURE<sup>®</sup> LFR<sup>®</sup> INSECTICIDE AND ETHOS<sup>®</sup> XB INSECTICIDE/FUNGICIDE

Capture<sup>®</sup> LFR insecticide and Ethos<sup>®</sup> XB insecticide/fungicide help maximize root health at planting with a next-generation, liquid, in-furrow insecticide/fungicide that's simple to mix with liquid fertilizer and delivers WCR root protection against this yield-robbing pest.

Product Attributes	Capture <sup>®</sup> LFR <sup>®</sup> insecticide	Ethos <sup>®</sup> XB Insecticide/Fungicide
<b>Active Ingredients:</b>	Bifenthrin	Bifenthrin + <i>Bacillus amyloliquefaciens</i> strain D747
<b>Class:</b>	Pyrethroid: IRAC Group 3A	Pyrethroid: IRAC Group 3A & Microbial: FRAC Group 44
<b>Recommended Rates:</b>	8.5 – 17 fl. oz./A	8.5 – 17 fl. oz./A
<b>REI:</b>	12 hours	12 hours
<b>Starter Fertilizer Compatible:</b>	Yes	Yes
<b>Benefit Provided:</b>	Protect roots from larval WCR feeding.	Helps maximize root health at planting and protect roots from larval WCR feeding.

## FOLIAR ADULT INSECTICIDE TREATMENTS TARGETED AT REDUCING GRAVID EGG-LAYING WCR ADULTS: STEWARD<sup>®</sup> EC INSECTICIDE

Steward<sup>®</sup> EC insecticide delivers reliable control of adult WCR when applied properly. Primary exposure is through ingestion with some contact activity for increased control levels and moderate residual activity. Adult WCR behaviors are affected (feeding, egg laying and mobility) within zero to four hours of ingestion and this product resists wash off once dried. There is minimal impact to many key beneficial insects and predators and there is no flaring of spider mites. Steward EC insecticide has been formulated to help eliminate mixing, handling and clean up issues and contains both an oil solvent and a surfactant package that provides optimal leaf wetting and surfactant characteristics for excellent crop protection.

Product Attributes	Steward <sup>®</sup> EC insecticide
<b>Active Ingredients:</b>	Indoxacarb
<b>Class:</b>	Oxadiazine: IRAC Group 22
<b>Recommended Rates:</b>	6-10 fl. oz./A
<b>REI:</b>	12 hours
<b>Benefit Provided:</b>	Suppress the number of eggs laid and potential WCR problems in the future. Plus, controls other Lepidopteran pests.

An effective and properly timed foliar insecticide application of Steward EC Insecticide can suppress the number of eggs laid and reduce potential WCR larval feeding problems in the future. Three factors are important to consider when applying Steward EC insecticide:

- 1. Proper Timing:** Treatments are usually started when more than 10% of the females are gravid. It is not advisable to make treatments too early, since more females will emerge to lay eggs and newly emerged silks and foliage will not be protected. It is not advisable to make treatments too late, since egg laying will already be complete.
- 2. Good Coverage:** Because this product needs to be consumed, it needs to get to where the adult WCR are feeding. It is recommended that 3-5 gallons/A are applied by aerial applications.
- 3. Proper Rate:** Field efficacy trials have shown Steward EC insecticide provides excellent knockdown and control at rates of 6-10 fl. oz./A. If high adult WCR numbers are present and longer residual control is needed, the higher rate should be used.

## INTEGRATED APPROACH: SOIL-APPLIED INSECTICIDE TREATMENTS AND ADULT FOLIAR INSECTICIDE TREATMENTS

**Soil-applied insecticide treatments**, such as Capture<sup>®</sup> LFR<sup>®</sup> insecticide and Ethos<sup>®</sup> XB insecticide/fungicide can provide protection to corn roots and help maximize yields. The research trial below shows that using Ethos<sup>®</sup> XB insecticide/fungicide can decrease root damage to Bt traited corn and conventional corn. In addition, the application of Ethos XB insecticide/fungicide to conventional corn can result in root ratings similar to that of just using Bt traited corn.

### COPELAND, KS, SCHMIDT FARM, 2020

Planted: 5/1/20; Hybrids Planted: Pioneer 1828 AM and Pioneer 1828 Q; Evaluated: 8/5/20

	Bt Traitd Corn	Ethos <sup>®</sup> XB insecticide/fungicide	Node Injury Scale (0-3)
★	Yes	Yes	0.04
★	No	Yes	0.14
	Yes	No	0.36
	No	No	0.74

Node Injury Scale: Oleson, J.D., Y. Park, T.M. Nowatzki, and J.J. Tollefson. 2005. *J. Econ Entomol.* 98(1): 1-8.

#### NIS = Node Injury Scale:

##### Economic threshold guidelines:

- If NIS < 0.25, no economic loss
- If NIS 0.25-0.75, economic loss dependent
- If NIS > 0.75, economic loss likely

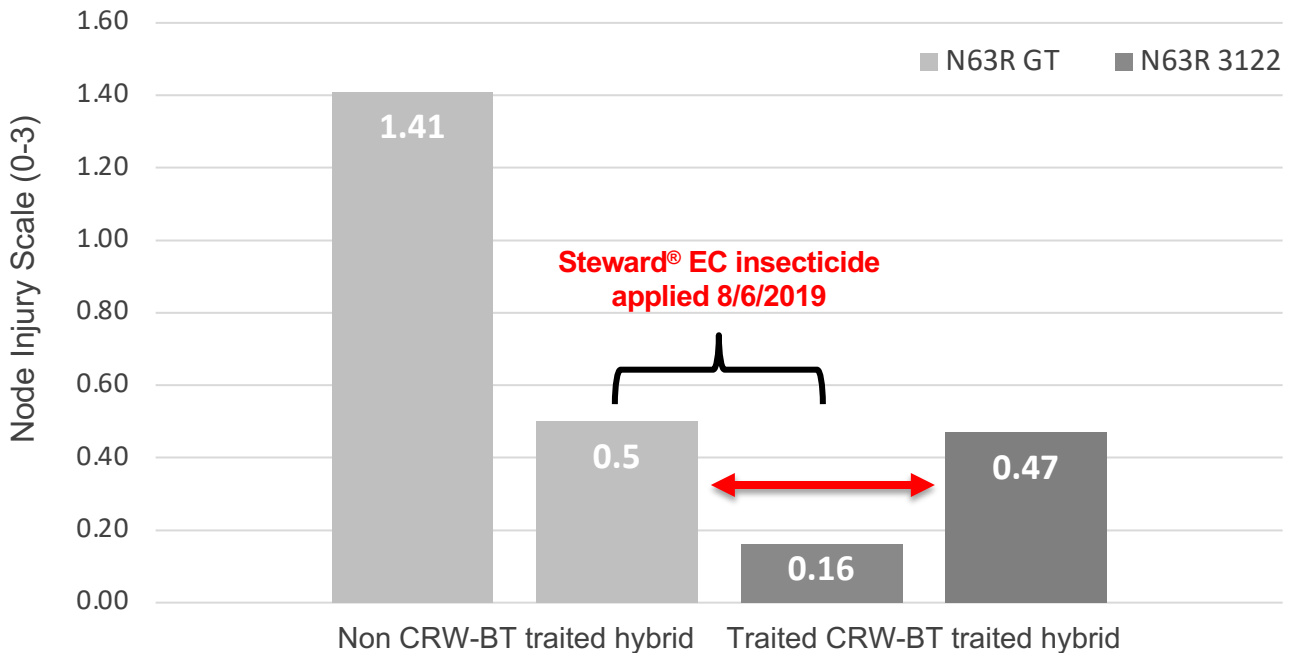
Ethos XB insecticide/fungicide application dramatically reduced root damage in Bt traited corn and resulted in the conventional hybrid root ratings looking similar to the Bt traited hybrid.

## INTEGRATED APPROACH: SOIL-APPLIED INSECTICIDE TREATMENTS AND ADULT FOLIAR INSECTICIDE TREATMENTS

**Adult foliar applied insecticide treatments** such as Steward<sup>®</sup> EC insecticide can drastically reduce WCR egg numbers and ultimately larvae the following year. The research trial below shows a Steward EC insecticide application made the prior year can reduce larval feeding in conventional corn to similar levels of just using Bt traited corn.

### IOWA STATE UNIVERSITY, DR. GASSMANN, JOHNSON FARM, AMES, IA, 2020

Planted: 5/1/20; Hybrids Planted: Syngenta N63R GT and N63R 3122; Evaluated: 7/27/20



Node-Injury Scale: Oleson, J.D., Y. Park, T.M. Nowatzki, and J.J. Tollefson. 2005. *J. Econ Entomol.* 98(1): 1-8.

#### NIS = Node Injury Scale:

##### Economic threshold guidelines:

- If NIS < 0.25, no economic loss
- If NIS 0.25-0.75, economic loss dependent
- If NIS > 0.75, economic loss likely

The Steward EC insecticide application applied the prior year, resulted in the conventional hybrid root ratings looking similar to the Bt traited hybrid the following year.