



# Evaluation of Corn Rootworm Management in Nebraska

## Trial Objective

- Evaluate the relative performance of commercially available, below-ground traits for corn rootworm protection.
- Demonstrate the value of below-ground, corn rootworm protection for reducing the potential of root damage.
- Highlight the improved corn rootworm control of trait platforms with multiple modes of action.

## Experiment/Trial Design

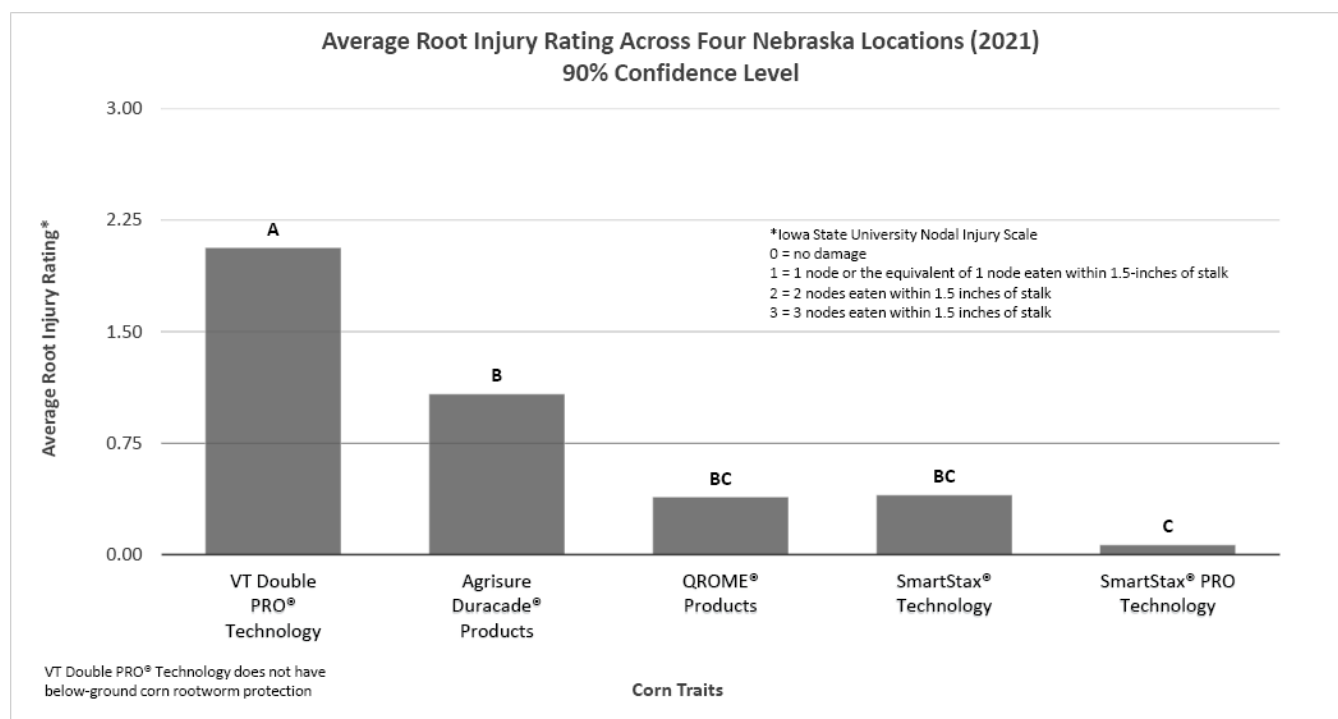
- This single replication strip trial was conducted across four locations during the 2021 growing season.
- Sites were selected for a history of corn rootworm damage and typical planting dates for the area were targeted.
- Each location planted locally adapted corn products with relative maturities of 104 to 113 days. The corn product genetics varied by available trait.
  - » Below-ground corn rootworm protection traits in the trial were:
    - SmartStax® PRO Technology
    - SmartStax® Technology
    - Agrisure Duracade® Products
    - Qrome® Products
  - » VT Double PRO® Corn, which does not have below-ground corn rootworm protection, was used as a check.
- 10 consecutive plants from each entry in representative areas of the plot were collected at the R1 growth stage and assigned a root damage rating using the Iowa State Nodal Injury Scale (NIS03).
  - » NIS03 has a 0 to 3 scale
    - 0 = No Damage
    - 1 = 1 node or the equivalent of 1 node eaten within 1.5-inches of stalk
    - 2 = 2 nodes eaten within 1.5-inches of stalk
    - 3 = 3 nodes eaten within 1.5-inches of stalk
- A multi-trait corn leaf field test was performed on all samples to verify the presence of specific traits and to avoid any refuge plants biasing the data. All refuge plants were excluded from the data and an average NIS 0-3 was calculated for each entry based on the treated plants.
- Weeds were controlled uniformly across the study with no insecticides or fungicides being applied. Nutrient management was managed by the landowners according to their agronomic plan.
- % Stalk Lodging, % Root Lodging, Yield, and % Moisture observations were collected at each location along with NIS 0-3.

Nebraska Locations	Soil Type	Irrigation	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Pilger	Silty Clay Loam	Dryland	Corn	Conventional	5/24/21	9/23/21	200	30,000
Gothenburg	Silt Loam	Center Pivot	Corn	Strip-till	4/30/21	10/31/21	250	34,000
Columbus	Silt Loam	Center Pivot	Corn	No-till	5/13/21	10/23/21	220	31,000
Imperial	Silt Loam	Center Pivot	Corn	Strip-till	5/07/21	11/22/21	225	34,000



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## Understanding the Results



**Figure 1. Average root injury rating across four Nebraska locations using the Iowa State University Nodal Injury Scale.**

- The average NIS 0-3 score across the four locations shows a statistically significant reduction in root feeding between products with VT Double PRO® Technology (that contain no below-ground protection) and the products that contain a below-ground trait (Figure 1).
- The average NIS 0-3 score across the four locations for SmartStax® PRO technology products was significantly lower than the Agrisure Duracade® products. Although not statistically significant, the NIS03 score for SmartStax® PRO technology products trended lower than the SmartStax® corn and Qrome® Products scores.

## Key Learnings

- This study illustrates that in a field with a history of corn rootworm pressure, planting a product with below-ground rootworm protection with multiple modes of action can significantly reduce the observed root feeding compared to a product with no below-ground trait for corn rootworm protection.
- SmartStax® PRO technology is the only trait platform tested that has below-ground insect protection with three modes of action. It did not statistically separate itself from the other below-ground trait platforms; however, its NIS03 score consistently trended better. Please reach out to your local agronomist for further insights.
- Management of corn rootworm requires a holistic approach that focuses on monitoring the life cycle and prevalence of the pest to determine the best pest control methods for the current and future growing seasons. Prior agronomic practices, like planting corn-on-corn, can create higher pest pressure than in rotated fields.
- Maintaining sound agronomic practices and planting corn products with corn traits that defend against corn rootworm should help provide the greatest protection to help preserve corn yield potential.




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## Legal Statements

The information discussed in this report is from a multiple site, non-replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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