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## New method for understanding corn rootworm injury

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# New method for understanding corn rootworm injury

## **Abstract**

In 2000, Jim Oleson and Jon Tollefson, corn rootworm researchers at Iowa State University, developed a new method for evaluating root injury. They abandoned the traditional Iowa 1-6 scale that had been the standard by which all corn roots were evaluated since 1971 throughout the United States. In its place, they developed the Iowa State node-injury scale. This new scale more accurately reflects the relationship of injury from the low to the high end of the scale.

## **Keywords**

Entomology

## **Disciplines**

Agricultural Science | Agriculture | Entomology

# INTEGRATED CROP MANAGEMENT

## New method for understanding corn rootworm injury

In 2000, Jim Oleson and Jon Tollefson, corn rootworm researchers at Iowa State University, developed a new method for evaluating root injury. They abandoned the traditional Iowa 1-6 scale that had been the standard by which all corn roots were evaluated since 1971 throughout the United States. In its place, they developed the Iowa State node-injury scale. This new scale more accurately reflects the relationship of injury from the low to the high end of the scale. For example, with the Iowa 1-6 scale a rating of 3 did not necessarily rate twice as much injury as a rating of 1.5. But with the Iowa State node-injury scale, there is a straight linear relationship, and a rating of 3 does indicate twice as much injury as a rating of 1.5.



**Corn rootworms can injure corn roots.**

[Enlarge](#) [1]

I encourage you to view the [interactive root rating page](#) [2]. This interactive site allows you to compare the old Iowa 1-6 scale to the new Iowa State node-injury scale. You also can follow the progression of injury by rootworm larvae on a computerized root.

To use the interactive node-injury scale, click on the image. The scale shows up in a new window. Once the scale has loaded, use arrow keys for precise movement: up and down to increase or decrease root injury, and left and right to rotate the root. The scale is a large file (9 MB) and requires QuickTime 4 or later version to operate.

Injury by corn rootworm larvae can result in a significant amount of the roots being injured or removed from the plant. A low Iowa State node-injury root value (0.25 or less) is highly desirable. A value of 0.25 node eaten is essentially the same amount of injury as 2.5 on the old Iowa 1-6 scale. This low root injury indicates that the insecticide adequately protected the roots from economic injury. Insecticide evaluations and root ratings for the past 3 years were [published in the December 2002 \*Integrated Crop Management\* newsletter](#) [3].

The table below shows corn rootworm injury in insecticide yield plots from the previous 3 years, specifically as it relates to root protection (product consistency), percentage of plant lodging, and grain yields. There are many factors that influence yield in these tests. In addition to corn rootworm injury to the roots, yield also is influenced by lodging and environmental factors such as wind, heat stress, nutrient levels, and moisture availability.

Thanks to Jim Oleson, Department of Entomology, for the insecticide performance data shown in the table.

**Table 1. Three-year (2000-2002) summary of root-injury, product consistency, percentage of lodging, and yield for planting-time insecticide treatments (Iowa State University corn rootworm efficacy tests; seven locations).**

<b>Insecticide</b>	<b>Placement<sup>a</sup></b>	<b>Node-Injury<sup>b</sup> (0-3)</b>	<b>Product Consistency(%)<sup>c</sup></b>	<b>% Lodging</b>	<b>Yield (bu/acre)</b>
Aztec 2.1G	T-band	0.22 a	81 a	1 a	159 ab
Force 3G	Furrow	0.27 a	78 a	3 a	161 ab
Force 3G	T-band	0.29 a	74 ab	6 ab	163 ab
Aztec 2.1G	Furrow	0.30 a	74 ab	2 a	168 a
Counter 20CR	T-band	0.30 a	74 ab	2 a	154 ab
Counter 20CR	Furrow	0.34 a	71 a-c	2 a	160 ab
Fortress 5G	T-band SB	0.41 ab	65 a-c	6 ab	158 ab
Fortress 5G	Furrow SB	0.45 ab	61 a-d	6 ab	160 ab
Lorsban 15G	T-band	0.47 ab	54 b-e	3 a	157 ab
Capture 2EC	T-band	0.51 ab	51 c-e	6 ab	162 ab
Lorsban 15G	Furrow	0.71 b	43 d-f	8 ab	155 ab
Regent 4SC	Furrow-M	1.03 c	35 ef	16 bc	164 ab
ProShield	ST	1.19 c	26 fg	22 c	149 bc
Prescribe	ST	1.29 c	12 gh	23 c	150 bc
Check	--	1.93 d	4 h	43 d	137 c

Side-by-side comparisons in 35 replications; replications that did not have sufficient larval feeding to challenge a product's performance (check, <0.75 of a node injured) were deleted from these analyses (35 of 44 replications analyzed). Means within a column sharing a common letter do not differ significantly according to Ryan's Q test ( $P < 0.05$ ).

<sup>a</sup> T-band and Furrow, insecticide applied at planting time; SB, SmartBox application of 3 oz. material/1,000, row-ft. in 2000 and 2001; 3.7 oz. material/1,000 row-ft. in 2002; Furrow-M, microtube application, in-furrow (water carrier rate of 4 gal./acre); ST, seed treatment.

<sup>b</sup> Iowa State node-injury scale (0-3). Number of full or partial nodes completely eaten.

<sup>c</sup> Product consistency is determined as percentage of times node-injury rating was 0.25 (1/4 node eaten) or less.

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**Source URL:**

<http://www.ipm.iastate.edu/ipm/icm//ipm/icm/2003/3-17-2003/nodeinjury.html>

**Links:**

[1] <http://www.ent.iastate.edu/imagegal/coleoptera/rw/0164.11crwncornroots.html>

[2] <http://www.ent.iastate.edu/pest/rootworm/nodeinjury/nodeinjury.html>

[3] <http://www.ipm.iastate.edu/ipm/icm/2002/12-23-2002/rw.html>

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