5-27-2009

Dynamic Black Cutworm Action Threshold

Erin W. Hodgson
Iowa State University, ewh@iastate.edu

Jon J. Tollefson
Iowa State University, tolly@iastate.edu

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Abstract
Two things must be balanced when deciding whether to apply pesticide: the cost of control and the value of the commodity that will be saved. Action thresholds are commonly used in field crop entomology, and are defined as the pest density at which chemical controls should be applied. Action thresholds are generally meant to be dynamic based on crop market value and ever-changing control costs.

Keywords
Entomology

Disciplines
Agricultural Science | Agriculture | Entomology

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Dynamic Black Cutworm Action Threshold

By Erin Hodgson and Jon Tollefson, Department of Entomology

Two things must be balanced when deciding whether to apply pesticide: the cost of control and the value of the commodity that will be saved. Action thresholds are commonly used in field crop entomology, and are defined as the pest density at which chemical controls should be applied. Action thresholds are generally meant to be dynamic based on crop market value and ever-changing control costs.

An action threshold has been established for black cutworm larval damage in corn. Last year, 2008, corn was much more valuable and the thresholds were lowered. This year corn prices are somewhat lower and it would be appropriate to raise the threshold accordingly, i.e., don't spend money on control unless it is profitable. This shows that it would be appropriate to routinely adjust the control action threshold as the expected yield and price per bushel of corn changes and the cost of control increases or decreases.

To facilitate calculating the changes in the black cutworm action threshold, an Excel spreadsheet with a dynamic threshold has been created. The calculations use the density of corn (plants per acre), expected yield (bushels per acre), and the anticipated value of a bushel of corn to determine the value of a single plant.

Then by dividing the cost of control by the value of a single plant, the number of plants that can be lost per acre to break even will be determined. Finally, by dividing the number of plants that can be lost to equal the cost of control by the actual stand count and multiplying by 100, the percentage of the plants that can be lost to break even is identified.

To make these calculations easier, follow this link to a downloadable spreadsheet template. There is an explanation with two examples to demonstrate the spreadsheet tools. The third column, Ex.3, contains a formula. If the user downloads the Excel spreadsheet and inserts their values for plant population, expected yield, anticipated market value, and the cost of control - an action threshold, in percent stand lost, will be calculated by the spreadsheet.

Please use anticipated yield estimates that are appropriate for the stand that has been planted and is established. By saving the Excel spreadsheet to the user's personal computer, it can be used repeatedly as the value of corn and cost of control change.

Erin Hodgson is an assistant professor of entomology with extension and research responsibilities. She can be contacted by email at ewh@iastate.edu or phone (515) 294-2847. Jon Tollefson is a professor of entomology with responsibilities in research and extension. He can be reached at (515) 294-

8044 or tolly@iastate.edu.

This article was published originally on 5/27/2009 The information contained within the article may or may not be up to date depending on when you are accessing the information.