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## Corn flea beetles and Stewart's disease risk for 2005

Marlin E. Rice

*Iowa State University*, [merice@iastate.edu](mailto:merice@iastate.edu)

Richard O. Pope

*Iowa State University*, [ropope@iastate.edu](mailto:ropope@iastate.edu)

Alison E. Robertson

*Iowa State University*, [alisonr@iastate.edu](mailto:alisonr@iastate.edu)

Forrest W. Nutter Jr.

*Iowa State University*, [fwn@iastate.edu](mailto:fwn@iastate.edu)

Paul Esker

*Iowa State University*

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# Corn flea beetles and Stewart's disease risk for 2005

## **Abstract**

Stewart's disease (also called Stewart's wilt) is a bacterial disease of corn caused by *Pantoea* (*Erwinia*) *stewartii*. The bacterium survives the winter in the gut of hibernating corn flea beetles. In the spring, adult flea beetles transmit the bacterium while feeding on corn. The bacteria are unable to spread from plant to plant without the beetle. Field corn inbreds and sweet corn are particularly susceptible to this disease. Therefore, seed producers in moderate- to high-risk areas should scout for early season flea beetle populations because, if left unchecked, substantial leaf damage during grain fill and yield loss can be expected.

## **Keywords**

Entomology, Plant Pathology

## **Disciplines**

Agricultural Science | Agriculture | Entomology | Plant Pathology

# INTEGRATED CROP MANAGEMENT

## Corn flea beetles and Stewart's disease risk for 2005

Stewart's disease (also called Stewart's wilt) is a bacterial disease of corn caused by *Pantoea* (*Erwinia*) *stewartii*. The bacterium survives the winter in the gut of hibernating corn flea beetles. In the spring, adult flea beetles transmit the bacterium while feeding on corn. The bacteria are unable to spread from plant to plant without the beetle. Field corn inbreds and sweet corn are particularly susceptible to this disease. Therefore, seed producers in moderate- to high-risk areas should scout for early season flea beetle populations because, if left unchecked, substantial leaf damage during grain fill and yield loss can be expected.



**Corn Flea Beetles on Leaf.**

[Enlarge](#) [1]

Stewart's disease can occur at any stage of plant development. Symptoms are almost always associated with flea beetle feeding. At the seedling stage, infected plants wilt rapidly from systemic infection, death is common, and plants that do survive are stunted. Later in the growing season, usually after pollination, leaf blight occurs. Disease symptoms are long wavy streaks that are initially water soaked, and then turn yellow and die. Corn flea beetle feeding scars are visible within the lesions. If the disease is severe, whole leaves may wilt and die. Mild winters during the past decade have resulted in an increased occurrence of Stewart's disease in Iowa.

Two models are available to predict the risk of Stewart's disease: the Stevens-Boewe Index and the Iowa State Mean Monthly Temperature Model.

### Stevens-Boewe Index

The Stevens-Boewe Index predicts the severity (how much of the corn leaf tissue is infected) of the leaf blight stage of Stewart's disease in the late summer. The risk is calculated by summing the average monthly temperatures for December, January, and February.

A sum below 80°F indicates a slight risk, 80°-90°F is considered low to moderate risk, and greater than 90°F is considered high risk. Forecasting with the Stevens-Boewe Index, southern Iowa has a low to moderate risk of the late leaf blight phase of Stewart's disease (Figure 1).

## Iowa State Model

The Iowa State Model predicts the prevalence (whether or not Stewart's disease occurs) of Stewart's disease. A high prevalence of Stewart's disease is predicted if the mean monthly air temperatures for December, January, and February are each above 24°F. For December 2004, the mean temperature was greater than 24°F in seven of nine climate districts (only the northern and northeast climate districts were lower). In January 2005, the mean temperature was below 24°F in all of the nine climate districts, but in February 2005 it was above 24°F in all nine climate districts. Therefore, the Iowa State Model predicts that there will be a moderate to high risk for Stewart's disease to occur in 2005 in approximately 75 percent of the state and a low risk for Stewart's disease in the north central and northeast regions of the state (Figure 2). We believe the Iowa State Model more accurately predicts the risk of Stewart's disease in Iowa than does the Stevens-Boewe Index.

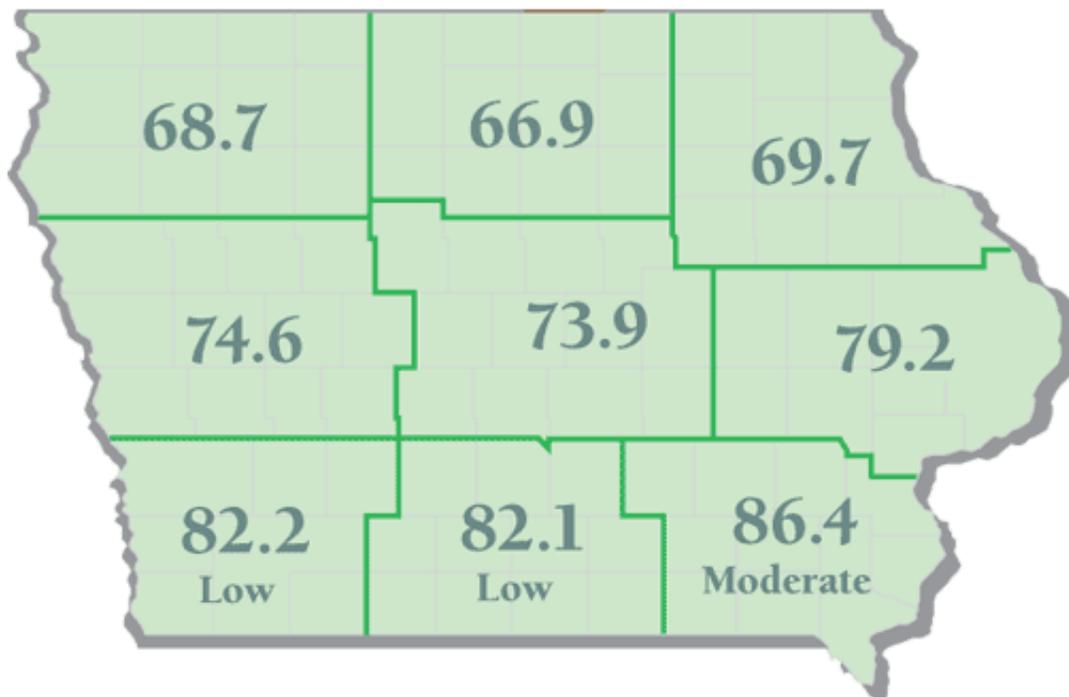
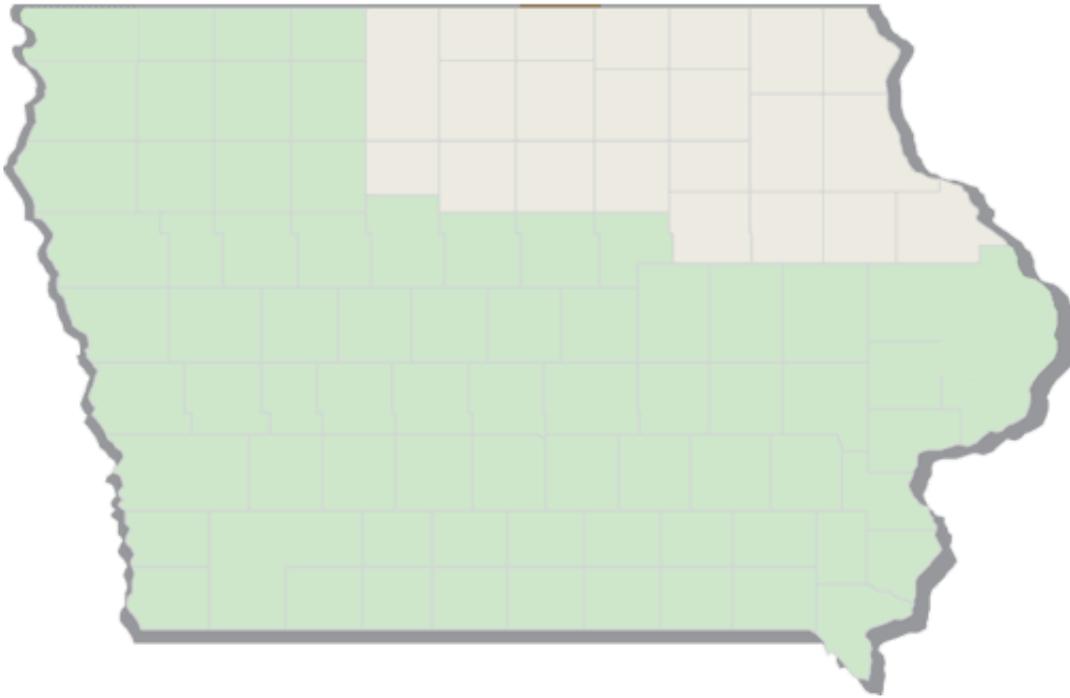


Figure 1. Stevens-Boewe Index predictions for the risk of Stewart's disease severity in Iowa in 2005.



*Figure 2. Iowa State Mean Monthly Temperature Model predictions for the risk of Stewart's disease in Iowa in 2005. Gray areas are predicted low risk and green areas are predicted moderate risk.*

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