

The Pernicious Potato Leafhopper – To Resist, Or Not To Resist?

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Potato leafhoppers are a very common insect pest of alfalfa throughout the Plains, Midwest, and northeastern United States. This insect pest has been a particular problem in several geographies this summer. During early June 2020, tropical depression Cristobal brought a heavy dose of leafhoppers north along the Mississippi River Valley to the Upper Midwest and eastern Canada. The heavy early infestation caught many alfalfa farmers off guard after experiencing light infestations the past few years. Spraying for leafhoppers after alfalfa shows symptoms of infestation is like ‘shutting the barn door after the horses bolt.’ With variable success in timely recognition of the need to control the pest, many alfalfa farmers are scratching their heads about how to be more prepared for future leafhopper outbreaks.



This photo shows an established alfalfa variety trial in Ohio. The trial was not sprayed for leafhopper control. Unsprayed conventional varieties exhibit leafhopper damage symptoms, whereas leafhopper-resistant germplasm maintains better growth. Photo Courtesy of J.S. McCormick, The Ohio State University.

Dr. Marc Sulc, a researcher at The Ohio State University, shared his observations recently, “This summer we have seen very high potato leafhopper populations across Ohio and especially in the western half of the state. Populations have exploded and have reached way above the economic action thresholds where control measures were not taken – up to 10 times above thresholds in many fields. This is resulting in severe damage to yield and crude protein content in unprotected, susceptible stands. In new seedings, forage growth has been slow due to dry and hot conditions. Harvesting has been delayed, resulting in the need for a second insecticide application in the same growth cycle in order to protect new stands of susceptible alfalfa varieties from the high potato leafhopper populations.”

For pesticide control to work, scout for potato leafhoppers with a sweep net *and* make timely pesticide spray applications when economic thresholds are reached. Recommendations can vary by state, but in general, the economic threshold for control is reached when you sweep fields and the number of leafhoppers per ten sweeps exceeds the height of the alfalfa in inches.

Commercial alfalfa varieties with resistance to potato leafhoppers have been available for more than twenty years. During that time, alfalfa breeders have worked to improve the yield of varieties with this recessive genetic trait. Leafhopper-resistant varieties still don’t quite keep up with the best conventional varieties for yield in the absence of leafhoppers. S&W’s research shows the best overall forage yield in the absence of leafhoppers comes from the most elite conventional varieties.

What about resistant- versus non-resistant-variety yield comparisons when leafhopper infestations occur? The yield story gets a bit more complicated when leafhoppers infest alfalfa. The level of resistance to leafhoppers has improved among the leafhopper-resistant commercial varieties, and these varieties hold onto a relatively greater proportion of their yield potential during leafhopper infestations. That ability to better preserve yield during leafhopper infestations gives leafhopper-resistant varieties the edge in unsprayed situations.

Leafhopper-Resistant Yield Comparisons. 2014-18 Unsprayed Trial Location Summary.

	Percent of Mean Yield
Leafhopper-Resistant	102%
Non-Resistant	98%

Untreated infestations that exceed the threshold for control favor varieties with the leafhopper-resistant characteristic. Conversely, fields that receive effective control of the pest through timely scouting and spraying when economic thresholds are met, often favor conventional varieties. The management choices are pretty clear. You can choose the best conventional varieties for high yield, with the commitment to scout for leafhoppers, and spray when economic thresholds are met. Otherwise, choose an adapted leafhopper-resistant variety if any of the following apply in your situation:

1. You don't always have the time to properly scout for leafhoppers during the growing season.
2. You can't seem to get good control of leafhoppers even when you scout and spray.
3. You are producing/selling alfalfa hay for organic use.

Check out these extension articles for more in-depth information about leafhopper identification, lifecycle, scouting methods, and economic thresholds for control...

<https://agcrops.osu.edu/newsletter/corn-newsletter/2020-17/time-start-scouting-potato-leafhoppers-alfalfa>

<https://ohioline.osu.edu/factsheet/ENT-33>

<https://ipcm.wisc.edu/blog/2020/07/potato-leafhopper-in-alfalfa/>

<https://extension.umn.edu/forage-pest-management/alfalfa-insects-what-look-and-how-scout>

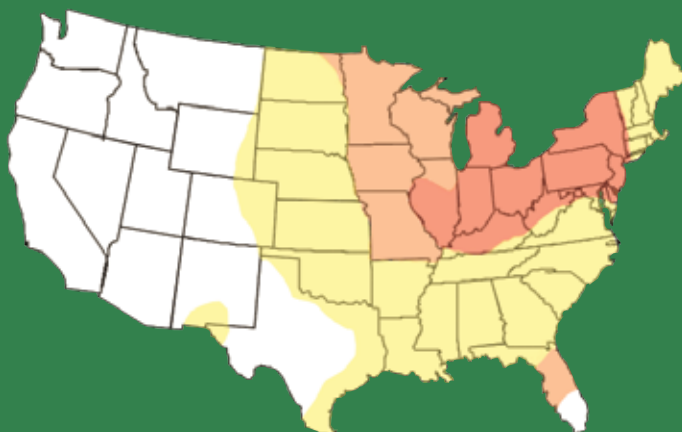
https://www.canr.msu.edu/news/scouting_for_potato_leafhoppers_in_alfalfa

<https://extension.psu.edu/potato-leafhopper-on-alfalfa>

Potato leafhoppers typically infest alfalfa during second and third cuttings. Adults overwinter along the Gulf of Mexico and spread northward each year, riding storm fronts coming up from the Gulf. Storm tracks in some years bring more of the pests northward and can quickly reach economic thresholds for control. In the absence of control, these insects use their piercing-sucking mouthparts to inject saliva into stems and suck out plant juices. As a result of the feeding process, alfalfa stems become infected and clogged. Symptoms begin to show as V-shaped yellowing and reddening of leaves, stunting growth and resulting in reduced yield of lower-protein forage.

Tropical storms and tropical depressions that can bring leafhoppers north out of the gulf coast usually commence in late May, and there can be more than a dozen such storms before they subside around October. During early June 2020, tropical depression Cristobal brought a heavy dose of leafhoppers north along the Mississippi River Valley into the Upper Midwest and into eastern Canada.

DISTRIBUTION AND SEVERITY OF POTATO LEAFHOPPER



- Not known to occur.
- Occurs but is not considered a problem.
- Occasionally causes significant losses on susceptible cultivars.
- Frequently causes significant losses on susceptible cultivars.

Potato Leafhopper Distribution Map, courtesy of North American Alfalfa Improvement Conference (NAAIC.org).