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## Potato leafhopper management in alfalfa

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# Potato leafhopper management in alfalfa

## **Abstract**

Potato leafhoppers have made their annual migration from the southern United States back to the alfalfa fields of Iowa. Small populations are being reported from across the state. During the last couple of years, producers have been planting potato-leafhopper-tolerant alfalfa to help prevent yield loss from this insect. Leafhopper-tolerant alfalfa looks, grows, and feeds similar to traditional leafhopper-susceptible alfalfa. It is different from susceptible alfalfa because the symptoms of feeding are much less severe.

## **Keywords**

Entomology

## **Disciplines**

Agricultural Science | Agriculture | Entomology

# INTEGRATED CROP MANAGEMENT

## Potato leafhopper management in alfalfa

Potato leafhoppers have made their annual migration from the southern United States back to the alfalfa fields of Iowa. Small populations are being reported from across the state. During the last couple of years, producers have been planting potato-leafhopper-tolerant alfalfa to help prevent yield loss from this insect. Leafhopper-tolerant alfalfa looks, grows, and feeds similar to traditional leafhopper-susceptible alfalfa. It is different from susceptible alfalfa because the symptoms of feeding are much less severe.

It is important to understand that potato leafhoppers will feed and survive in this tolerant type of alfalfa and this is why it is described as **tolerant**. Under similar leafhopper stress, tolerant alfalfa will show less hopperburn and less stunting compared with alfalfa without leafhopper tolerance. This advantage is recognizable only if the leafhopper population is moderate or large. Exactly how this alfalfa tolerates leafhopper feeding is poorly understood.



[1] **Potato leafhopper adult.**

Research has shown that an established stand of tolerant alfalfa can produce about 1 ton per acre more alfalfa per year than susceptible alfalfa when the leafhopper population is high and alfalfa is left unsprayed. However, tolerant alfalfa is not a cure-all for leafhopper problems. The benefit of leafhopper-tolerant alfalfa is minimal during the first growth interval of the seeding year. Tolerance increases greatly after this initial growth period. Moreover, tolerant alfalfa can still suffer loss from potato leafhopper if populations are exceptionally high.



[2] **Severe hopperburn (stunted plants, weed growth) on alfalfa .**

## Scouting for potato leafhopper

Scouting for potato leafhoppers is an easy and reliable way to prevent serious yield loss. Scouting involves two components: estimating the density of potato leafhoppers and comparing this estimate to an economic threshold. Scouting should begin now and continue until populations decline in late summer. We recommend using a sweep net to estimate the density of leafhoppers in a field. Swing the net like a clock pendulum in front of you as you walk through the alfalfa. Be sure the net goes as deep in the alfalfa canopy as possible, and stop after 10 sweeps through the canopy. Count all of the adults in the net; most will be

collected in the bottom of the net. This number is an estimate of leafhoppers per 10 sweeps. Confidence in your estimate will increase if you repeat this procedure in different places in the field and average the 10-sweep estimates. Also, while sweeping estimate the height in inches of the alfalfa canopy. The next step is to compare the estimate of the leafhoppers to the economic threshold.

An economic threshold is a pest density that, if the alfalfa is left unsprayed, will cause yield loss greater than the cost of an insecticide treatment. Thus, the gain in yield from spraying an insecticide is greater than the cost of the insecticide treatment. There are three factors to consider when determining the correct economic threshold. First, know whether you are scouting leafhopper-tolerant alfalfa or traditional alfalfa. It takes about 10 times more leafhoppers in an established stand of tolerant alfalfa to cause the same amount of loss in traditional alfalfa. Therefore, these alfalfa types have different economic thresholds. Second, estimate the height of the alfalfa when scouting for potato leafhoppers. Taller alfalfa is damaged less by the leafhopper than shorter alfalfa. Third, estimate the cost per acre of an insecticide treatment. Using these three variables and the tables provided herein you can calculate the correct economic threshold.

Tables 1 and 2 show the economic thresholds for traditional- and potato-leafhopper-tolerant alfalfa, respectively. The numbers represent the average catch of potato leafhoppers per 10 sweeps.

**Table 1.** Economic thresholds (potato leafhoppers per 10 sweeps) for potato leafhopper on traditional alfalfa.

	Cost of insecticide treatment (\$)				
Alfalfa height (inches)	10	12	14	16	18
4	2	3	4	5	6
6	3	5	6	8	9
8	4	6	8	10	12
10	5	8	10	13	15
>10	10	16	20	26	30

**Table 2.** Economic thresholds (potato leafhoppers per 10 sweeps) for potato leafhopper on tolerant alfalfa.

	Cost of insecticide treatment (\$)				
Alfalfa height (inches)	10	12	14	16	18
4	21	30	41	50	60

6	32	46	62	76	90
8	42	61	82	101	120
10	53	76	103	126	150
>10	106	152	206	252	300

**VERY IMPORTANT:** Use the threshold for traditional alfalfa when scouting tolerant alfalfa during the initial growth interval of the seeding year.

## Management of potato leafhoppers

Harvesting alfalfa can eliminate leafhopper eggs already laid in stems, suppress the nymphal population by killing or removing them from the field, and displace adult leafhoppers to adjacent sources of food. Combined, these effects slow the growth of leafhopper populations. However, adjusting the harvest schedule to suppress leafhopper populations below the economic threshold usually is not justifiable. Using this tactic alone can increase the harvest frequency and can compromise forage quantity and stand persistence.

Another preventive tactic that suppresses potato leafhopper populations is planting alfalfa and grass mixtures. Grass is a poor food source for this leafhopper and research has shown that its populations are smaller in these mixed forage systems. In this instance, suppressing the leafhopper population comes with a cost--the grass component will lower the overall forage quality. Producers should consider forage use and desired forage quality before using this tactic alone to suppress leafhopper populations.

Applying an insecticide is the most reliable way to suppress a potato leafhopper population that has exceeded the economic threshold. The use of an insecticide is justified only if the field has been scouted and the leafhopper density exceeds its economic threshold. Labeled insecticides and the minimum manufacturer rates are listed in Table 3.

**Table 3.** Insecticides labeled for potato leafhopper and their minimum manufacturer rates.

Product	Rate per acre	Preharvest interval
Ambush*	3.2 ounces	0 days
Baythroid*	0.8 ounces	7 days
Furadan 4F*	1 pint	14 days
Lorsban 4E	0.5 pint	7 days
PennCap-M*	2 pints	15 days
Pounce 3.2 EC*	4 ounces	0 days
Sevin XRL Plus	2 pints	7 days
Warrior T or 1E*	1.92 ounces	7 days

\*Restricted use pesticide.

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