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Managing Potato Leafhoppers in Alfalfa

By Erin Hodgson, Department of Entomology

There have been recent reports of potato leafhopper in Iowa alfalfa (Photo 1), and it's time to think about assessing alfalfa stands. Potato leafhoppers do not overwinter in Iowa, but they are persistent alfalfa pests every growing season. Storms along the Gulf of Mexico bring adult potato leafhoppers north and drop into fields every spring.



Photo 1. Potato leafhopper adult and nymph. Photo by Penn State College.

Mated females begin to deposit two to three eggs per day in alfalfa stems as soon as they land. Pale, green nymphs emerge in 7-10 days depending on the temperature; the fastest development occurs at 86°F. They go through five instars in about two weeks. Therefore, a large population could develop three weeks after the northern migration. The extended egg-laying period can result in at least two overlapping generations in Iowa every year.

Plant Injury

Potato leafhoppers have piercing-sucking stylets. They cause physical damage when probing to feed and also inject saliva that plugs vascular tissue. Initially, alfalfa leaf tips will turn yellow, which is commonly referred to as "hopperburn" (Photo 2). Heavily infested plants will be stunted, particularly new stands and regrowth after cutting. In some cases, large leafhopper populations can significantly reduce tonnage of the current crop, as well as the following crop.



Photo 2. Typical hopperburn caused by potato leafhopper feeding. Photo by Purdue Extension.

Scouting

Potato leafhoppers do not typically build up to damaging levels during the first crop in Iowa. Fields should be monitored weekly after the first cutting until the end of the season. A sweep net is the most effective way to sample for potato leafhoppers because adults and nymphs are very active and easily disturbed. Adults will jump or fly away while nymphs quickly move sideways and backwards. A detailed description on how to make and use a sweep net is available [here](#).

Fields should be sampled when dry and in calm conditions. Sweep vigorously through foliage, using a 180-degree motion for one sweep. For each field, stop at four to five locations and take 25 sweeps per location. Count the number of nymphs and adults at each location and estimate the number of potato leafhoppers per sweep for each field. Keep in mind nymphs will be near the sweep net ring and adults will be at the bottom of the net.

Management

Remember, healthy and vigorous stands are able to tolerate some potato leafhopper (and other insects) feeding. Heat or drought stress can make alfalfa more susceptible to insect feeding. Protecting alfalfa from potato leafhopper usually involves a three-pronged approach:

1. The use of glandular-haired alfalfa varieties can significantly reduce yield losses. More than 70 percent of alfalfa is now resistant to potato leafhopper. Adults are repelled by plant hairs, and nymphs get caught in the sticky hairs and starve. Newly planted resistant fields may not show resistance immediately, but should develop sticky hairs after becoming established. Glandular-haired alfalfa is not the same as non-yellowing varieties. These tolerant plants only hide leafhopper feeding and do not prevent yield loss.
2. The cultural control tactic of cutting stands can disrupt potato leafhopper populations as they develop in alfalfa. Delaying harvest will allow nymphs enough time to become adults and start reproducing. Young nymphs will be destroyed or starve before regrowth occurs. Timely cutting will force adults to move to nearby crops, but they often move back into a field after regrowth occurs. It is

important to start scouting 7-10 days after each cutting to monitor for possible reinfestations.

- Insecticide applications can protect alfalfa yield from potato leafhoppers and are economically justified with regular scouting and the use of economic thresholds. The fluctuating values of hay and control costs are important considerations for making a treatment decision. Table 1 offers a dynamic threshold for potato leafhopper. There are several products registered in Iowa for potato leafhopper control in alfalfa. Follow label directions and pay attention to preharvest interval guidelines.

Table 1. Economic threshold of potato leafhopper, based on the average number of leafhoppers per sweep (Originally published by [John Tooker, Penn State Extension](#)).

		Plants 0-4 inches AND				Plants 4-8 inches AND				Plants 8-12 inches AND			
		Control costs (\$/acre)				Control costs (\$/acre)				Control costs (\$/acre)			
		\$12	\$14	\$16	\$20	\$12	\$14	\$16	\$20	\$12	\$14	\$16	\$20
Hay value (\$/ton)	\$120	0.34	0.37	0.38	0.50	0.50	0.53	0.69	0.85	1.42	1.73	2.10	2.49
	\$140	0.30	0.32	0.35	0.43	0.43	0.45	0.57	0.70	1.21	1.49	1.78	2.08
	\$160	0.27	0.29	0.30	0.38	0.38	0.38	0.49	0.60	1.05	1.31	1.55	1.77
	\$180	0.25	0.26	0.27	0.33	0.33	0.34	0.42	0.52	0.93	1.16	1.37	1.54
	\$200	0.23	0.24	0.25	0.30	0.30	0.30	0.37	0.46	0.84	1.05	1.23	1.36
	\$220	0.21	0.22	0.23	0.27	0.27	0.27	0.33	0.41	0.76	0.96	1.11	1.22
	\$240	0.20	0.20	0.21	0.25	0.25	0.26	0.30	0.37	0.69	0.88	1.01	1.10
	\$260	0.19	0.19	0.20	0.23	0.23	0.24	0.27	0.34	0.64	0.81	0.93	1.00
	\$280	0.18	0.18	0.19	0.21	0.21	0.22	0.25	0.31	0.59	0.76	0.86	0.92
	\$300	0.17	0.17	0.18	0.20	0.20	0.21	0.23	0.29	0.55	0.71	0.80	0.84
	\$320	0.16	0.16	0.17	0.19	0.19	0.20	0.21	0.27	0.51	0.66	0.75	0.78
	\$341	0.15	0.15	0.16	0.17	0.17	0.18	0.19	0.25	0.48	0.63	0.70	0.73
	\$360	0.14	0.14	0.15	0.17	0.17	0.17	0.18	0.23	0.45	0.59	0.66	0.68
	\$380	0.14	0.14	0.15	0.16	0.16	0.16	0.17	0.22	0.43	0.56	0.62	0.64
	\$400	0.13	0.13	0.14	0.15	0.15	0.15	0.16	0.20	0.41	0.53	0.59	0.60

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