

## INFLUENCE OF POTATO LEAFHOPPER ON ALFALFA YIELD AND QUALITY

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The potato leafhopper has the distinction of being one of the native insects that can have a very major impact on the production characteristics of alfalfa. This insect is very definitely the second most important pest of this crop, with the alfalfa weevil, an imported insect, holding the distinction of being the most damaging. These tiny insects (full grown potato leafhoppers are 1/8 inch long) have a very definite impact on alfalfa but their damage is very insidious and hard to recognize.

These insects are not able to survive Kentucky winters and therefore they have to migrate into the state each spring. They arrive on spring storms about June and become a threat to alfalfa in late June, July and August.

Potato leafhoppers are wedge-shaped and yellow-green in color. The adults have well developed wings and they fly readily into alfalfa fields. The females lay their eggs in the stems and petioles of the alfalfa plant. The nymphs that hatch are miniature versions of the adults except that they lack wings and have a more yellow color. These insects have a relatively short life cycle; they are able to complete their life cycle in as little as three weeks. Large populations can develop in short time.

Both the adults and the nymphs feed on the juices of the alfalfa plant, using their piercing-sucking mouthparts. Externally this feeding seems to cause very little physical damage to the plant. However, the feeding activity of these insects has several effects that can cause the plant both short and long term damage.

A field that is heavily infested with potato leafhoppers will begin to take on a yellow cast. This is because the plant is reacting to a toxin, that is injected when the insect feeds, that inhibits the movement of sugars from the leaves to the other parts of the plant. The accumulation of these sugars in the leaves causes the creation of the characteristic triangular shaped yellowing at the tips of the leaves.

If this was the most damage caused by this pest it would be of little consequence. The damage that these insects cause is related to the quality of the plant much more than it is related to the quantity or yield of the plant. In some ways this is unfortunate because it is very difficult for the farmer to recognize the impact of this insect on the alfalfa crop. In some very heavily infested fields it has been possible to demonstrate that very heavy leafhopper populations have caused yield reductions.

Despite the fact that lower populations of leafhoppers have little impact on the alfalfa's yield, they do impact very heavily

on a very important quality component...PROTEIN. Relatively low populations of potato leafhoppers cause reductions of the percent protein content of 5 to 10%. This reduction becomes more pronounced as the crop becomes more mature. Alfalfa loses protein content as it becomes more mature, the leafhopper actually increases that loss.

As we indicated earlier, potato leafhopper feeding restricts the movement of sugars and therefore reduces the ability of the plant to build valuable root reserves. The reduction of root reserves of carbohydrates reduces the plants vigor. It makes it more difficult for the plant to recover from harvest. Since the root reserves are lowered, the plants grow more slowly and, thus, the time between harvests is lengthened. This is important to the producer because it can reduce the number of harvests. In addition, it increases the time available for the insects to rebuild their populations and allows the earlier damage to be compounded.

The impact on root reserves is damaging in a second way. They actually produce fewer stems per crown. This translates directly into a reduction in the yield. The damage done by leafhoppers on a previous cutting causes these subtle impacts on the succeeding cuttings. Interestingly enough, this damage is not visible on the plants if they are not being fed upon by the leafhoppers. They look green and healthy but the impact is still there.

The reduction in the level of root reserves also makes the plant less well prepared to enter the winter. The plant that has lowered root reserves has a better chance to be winter killed. Therefore, potato leafhopper damage exhibits itself with stand loss during a time when the insect has been long killed by cold weather.

Potato leafhoppers can be managed. It is very important that the fields be monitored to determine whether the population is high enough to warrant control. To do this, it is necessary to use a 15 inch sweep net to sample the leafhopper population. Ask your county agent for a copy of ENT 17 INSECTICIDE RECOMMENDATIONS FOR ALFALFA AND CLOVER - 1987. It has the procedures delineated that will help you to determine whether control is necessary.

If control is needed to reduce potato leafhoppers, two options are available. If the crop is early in regrowth, an insecticide is going to be required. All the insecticides listed in ENT 17 are effective against this insect.

If the crop is within ten days of normal cutting and leafhopper control is needed, then harvest is an excellent control measure. Good close cutting and removal of the crop will reduce the leafhopper population by 90 - 95%. It is interesting to note that the potato leafhopper population actually gets a head start on the crop if the cutting is sloppy. The nymphs and adults are able to survive on plants left in the field. This allows the insects to impact on the regrowth when it is small, which can be quite damaging.

The potato leafhopper is the "mighty mite" of damage in alfalfa. It causes a reduction in protein content, and carbohydrate root reserves. The first impact causes a direct impact on the quality of the forage. The second impact causes reduced vigor and can result in reduced yield and a hastening of stand loss.

Luckily, the pest can be managed with timely harvests and the judicious use of insecticides. Don't let this insidious little insect steal your alfalfa profits.