Traders Dispatch
Version, April 20, 2018

# Alfalfa blotch leafminer: A new serious threat to alfalfa crop in Montana?

**By Gadi V.P. Reddy, Govinda Shrestha, Anamika Sharma and Stefan T. Jaronski**
**Montana State University, Western Triangle Agricultural Research Center, Conrad, MT and USDA-ARS, Northern Plains Agricultural Research Laboratory, Sidney, MT**

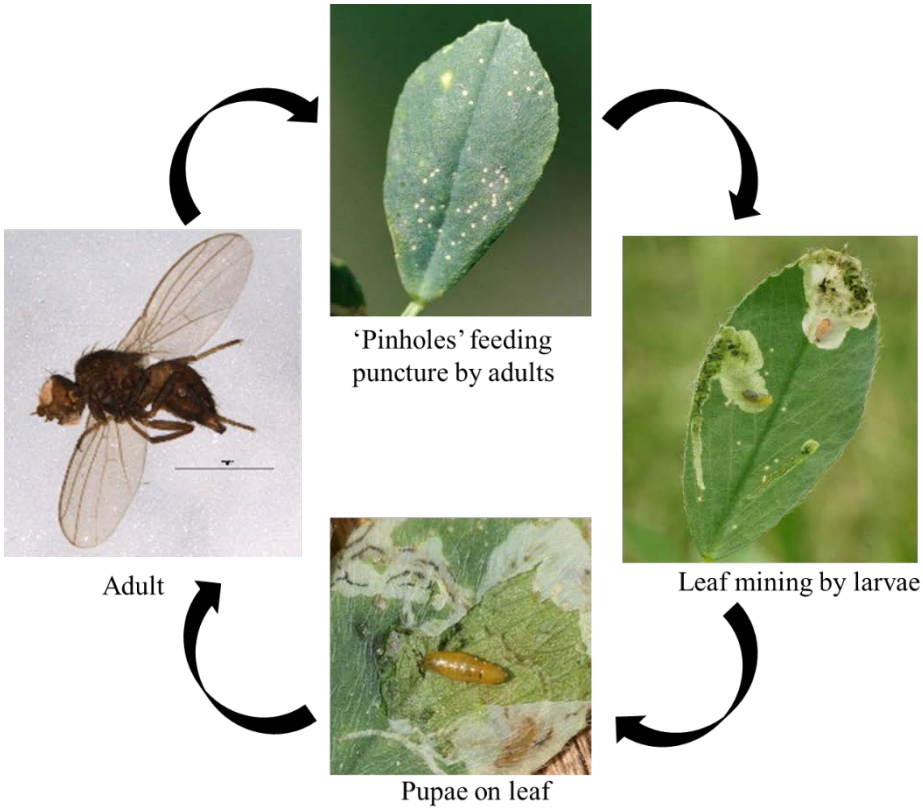
---

This year, Montana alfalfa producers might need to watch out for a new pest called “alfalfa blotch leafminer (ABL)” [*Agromyza frontella* (Rondani)]. This pest debuted last year (2017) in Eastern Montana and it is therefore likely to spread to other parts of Montana. ABL is pest of European origin that was discovered first time in Massachusetts in the late 1960s followed by Minnesota (1994), Wisconsin (1997) and North Dakota (1998). This pest has also recently reported in Alberta, Canada in 2005. ABL infestations is reported to reduce alfalfa yields by 7-20% and protein content by 10-20 % without control measures.

Alfalfa (*Medicago sativa*) is a major hay crop in Montana and is a preferred host of ABL. Alfalfa producers should be aware of pest morphology, biology, damage symptoms and control measures of ABL. The adults ABL is a very small (about 1/8 inch long), hump-backed black fly. In spring, females lay an average of three eggs on the bottom side of leaves and each female can lay up to total of 140 eggs. The larvae (also called maggots) are pale yellow and mine between the leaf surfaces. Adult feeding cause tiny “pinholes” on the leaf surface. Adult puncturing is not considered a significant problem but is an indication of early damage symptoms. The larvae feed inside the leaflet, producing tunnels or mines in the middle of the top and bottom layers of the leaf (Figure 1). These tunnels create a "blotchy" appearance as this process starts at the base of the leaflet and widen towards the leaf apex. The larvae feed within the alfalfa leaves for about six to 17 days. Once the development is complete, larvae will leave the leaf and fall to the ground to pupate. Temperature dependent pupal diapause occur in ABL, which mainly happen in October–November and as per published information, it has 3–4 generations per year. However, the ABL life-cycle in Montana remains unknown.

Although economic threshold levels for ABL have not been determined in Montana, control may be initiated when 30-40% of the leaflets (or 250 pinholes per three leaves) show adult pinhole feeding scars in plants. Therefore, it is advisable to scout alfalfa fields weekly to assess the percentage of leaves with pinhole feeding during alfalfa cropping period. Since the alfalfa crop attracts and houses many beneficial insects including crop pollinators, producers should be careful when deciding chemical control application. The management practices including chemical control for ABL can be found in the High Plains Integrated Pest Management Guide (https://wiki.bugwood.org/HPIPM:Alfalfa_Blotch_Leafminer). Early cutting can be used to decrease damage and would be advantageous through first cut. Also, hay should be removed from the field as soon as possible to prevent pupae from surviving. Regarding biological control options, the larval parasitoids *Dacnusa dryas* (Nixon) and *Chrysocharis liriomyzae* Delucchi have been found effective with parasitism rates greater than 50% in northeastern United States. These parasitoids are already established in the Midwest and eastern Canada. If our survey studies indicate the pest populations and damage levels are high, the parasitoids could be produced and

released to manage the ABL population. However, multiple releases of parasitoids might be necessary to control ABL wherever it has spread into new areas ahead of its natural enemies. Our monitoring studies will also determine if these parasitoids have been introduced fortuitously along with the pest.




(Figure 1). Photo Credits: Alfalfa blotch leafminer: pupae and adult (Agrobase); adult feeding puncture (Whitney Cranshaw, Bugwood.org) and leaf mines produced by larval tunneling (M. Billard, aramel.free.fr)

The researchers at WTARC are planning to carry out monitoring of this pest and also do some experiments on the effect of jasmonic acid (JA) and its derivatives (jasmonates, JAs) and methyl jasmonate (MeJA) for managing the alfalfa blotch leaf minor. These are phytohormones with essential roles in plant defense against insects and diseases. Plants can advance a range of immune and defense responses in their cells. The team will determine the pest population distribution, abundance and damage assessments. Our previous laboratory and field experiments indicated that JA was most effective in reducing larval populations of wheat midge and kernel damage levels, and produced a higher spring wheat yield. If anybody notices alfalfa blotch leafminer please contact Entomology/Insect Ecology team at 406-278-7707.