

## Corn Blotch Leafminer

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The corn blotch leafminer is an uncommon and usually minor pest, but it can damage corn. This NebGuide describes the biology of the leafminer.

A previously uncommon leaf mining fly was reported in high numbers in 1995 in corn fields around Holdrege in south central Nebraska. Numbers were lower in subsequent years, but damaging populations have again been reported since 2004 at locations across central Nebraska. This NebGuide describes what is known about the biology of this usually uncommon pest of corn.

Because the leafminer is a sporadic, usually minor pest, little research information is available about its biology, damage potential and management. The most recent comprehensive biological research on this insect was published in 1914 by W.J. Phillips. Much of the biological information reported below is from that publication.

The corn blotch leafminer adult is a tiny fly, about 1/4 inch long. Flies lay eggs on corn leaf surfaces and as they hatch, fly larvae (maggots) tunnel into corn leaves. They feed internally by scraping away green leaf tissue, leaving behind

transparent tunnels or mines. As the maggots grow, the mines increase in width. When larvae are mature they drop off the plant and pupate in the soil. Pupae are about 1/4 inch long, brown and cylindrical in shape. Adults emerge and start the cycle over. There are several generations in a year. During the hottest part of the summer, a fly can complete its life cycle in about three weeks. Although it is not known definitely, it is likely that leafminers overwinter in the soil as pupae.

Of cultivated crops, corn blotch leafminers primarily damage corn. However, they have been reported to feed on several grassy weeds (barnyardgrass and crabgrass). They also have been reported to feed on some of the cultivated *Panicum* millets. Although not reported in the literature, it is possible that fall panicum also could be an alternate host.

If the leafminers tunnel extensively in corn leaves, they may kill the leaves. Crop consultants reported in 1995 that four to six lower leaves per plant were heavily damaged by leafminer feeding in whorl stage corn in many fields in Phelps County. Typically, later corn leaves are thicker and tougher, and tunneling occurs only on the lower or upper leaf surface, not all the way through, reducing plant injury.



Corn blotch leafminer injury



Corn blotch leafminer larva

Data from *Assessing Hail Damage to Corn*, by J.J. Vorst ([www.extension.iastate.edu/Publications/NCH1.pdf](http://www.extension.iastate.edu/Publications/NCH1.pdf)) can be used to estimate potential losses from corn blotch leafminers. On seven-leaf corn, if plants average 35 percent or less leaf area destroyed, no yield loss would be expected. If plants averaged 50 percent leaf area destroyed, 2 percent yield loss would be expected. On 10-leaf corn, if plants average 20 percent or less leaf area destroyed, no yield loss would be expected. If plants averaged 50 percent leaf area destroyed, 6 percent yield loss would be expected. Loss estimates from hail studies should only be used as a rough guide to potential yield effects. They do not accurately reflect potential damage from corn blotch leafminers, since leafminers primarily feed on leaves in the lower half of the plant, and hail loss assessment is based on injury over the whole corn canopy.

Even if leafminers are causing measurable yield loss, it doesn't necessarily mean that insecticides should be applied. Control efforts probably would have to be targeted at the flies before they lay eggs, as the fly maggot is protected inside the leaf from insecticides. However, repeated applications likely would be needed to reduce injury levels, and the expense probably would not be worth the benefit. Since economic infestations are so rare, studies have not been conducted to evaluate insecticide efficacy against this pest on corn.

Entomologists are unsure why leafminer damage was so extensive in 1995. Usually several species of parasitic wasps control the leafminer. One hypothesis to explain higher

leafminer numbers is that beneficial wasp numbers were reduced. Interestingly, the area reporting higher than normal leafminer levels in the mid-1990s corresponds to where aerial applications of broad spectrum insecticides to control corn rootworm beetles has been a common practice for many years. Another possibility is that increased leafminer numbers are due to the mild weather during the 1994-1995 winter. Leafminer damage was much lower in 1996 in the Holdrege area, but still more common than usual. The current outbreak since 2004 cannot be explained by insecticide suppression from foliar insecticide use, since foliar insecticide has generally decreased in corn since the 1990s.

The possibility that the leafminer was a problem because something disturbed natural biological controls is consistent with the opinion of W.J. Phillips (1914), who wrote:

*“With such a host of parasites as are listed in the preceding pages constantly on the watch, we need not concern ourselves seriously with remedies so long as conditions continue as they are now. In the event that a combination of circumstances should occur that would restrain the parasites and give free rein to their host, the blotch miner would undoubtedly prove a pest very difficult of control. This species seems to furnish an instance in which only the barrier of parasites stands between the farmer and what may easily become, temporarily at least, a very serious pest.”*

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