

Wheat midge a possible new wheat pest in Washington State

The wheat midge (*Sitodiplosis mosellana*) was found in several eastern Washington counties in 2011, with the potential to damage spring wheat crops. However, WSU scientists do not recommend that farmers apply insecticides unless they know they have an economic infestation.

The midge (Fig 1) is also called the 'orange wheat blossom midge' because it is orange in color and it infests wheat at pollination (flowering). It originated in Europe and has been an economic pest in the Canada and the northern US, including most recently; Bonner, Boundary, and Kootenai Counties in Idaho.

The 2011 situation

In 2011, scientists put out pheromone traps for the wheat midge because we suspected it would move in from Idaho. The insect was captured in low numbers in pheromone traps in Spokane County (Peone Prairie and Fairfield), Lincoln County, and Garfield County. The midge is probably also in other easternmost counties in the high rainfall zone.

The wheat midge has been reported previously in Washington, so this is not a new finding for the state. However, we don't know the background population levels of the midge, and whether this year's data represent an increase in numbers.

The pheromone is a sex hormone that attracts only the adult male wheat midge. Because the pheromone draws in insects from across large fields, the trap is a sensitive indicator of the presence of the midge but it is not a reliable measure of its population density in the field. However, closer examination of wheat fields did not reveal midge populations that would likely cause economic damage this season.

Consequently we did not recommend that growers go out immediately and spray their crops because that kills beneficial insects such as ladybird beetles.



Figure 1: The adult wheat midge is about 1/2 the size of a mosquito and rests 'head up' on wheat heads.



Figure 2: Wheat midge larvae inside a dissected wheat floret

Action plan

We are in contact with researchers in Canada and the Midwest who have biological control agents for this pest. While the midge populations are still at low levels, we will take the opportunity to bring in the biocontrols.

We will also seek funds to enable us to determine the extent of this infestation and to track population changes. The trap catches from this season (2011) will serve as baseline data.

Identifying the wheat midge

The adult orange wheat blossom midge (Fig 1) is a fragile insect with a body type similar to a mosquito, but about half the size. It has an orange body, conspicuous black eyes, 3 pairs of long legs and one pair of wings. The female lays eggs on the awns and heads of wheat plants. The eggs hatch into larvae (Fig 2) that crawl inside the floret and feed on the developing grain, causing yield loss and shrunken kernels.



Figure 3: Wheat midge larvae (dark yellow) and wheat anthers (pale yellow) from a dissected wheat head.

The larvae are about the same size, shape, and color as the anthers of the wheat floret (Fig 3). Spring wheat crops (Fig 4) are most susceptible to infestation (egg-laying) by the midge from heading until the anthers hang out of the florets. After that time the midge causes little damage.

Winter wheat and barley crops are seldom affected. In addition, the midge needs warm temperatures, calm weather, and moisture for successful egg laying.

During the day the adult midges hide deep in the crop canopy. The best time to scout for the midge is on calm, clear evenings within 1 hour of sunset. The adults may be seen flying in the canopy or sitting on wheat awns with their heads facing upwards (Fig 1).

Take care with identification! There is a lookalike fly that has an orange, but fat, body and it rests **head downwards** in the wheat. And other tiny, orange blobs on the wheat head may actually be aphids (Fig 5).

Various other insects were also found in the pheromone traps in 2011(Fig 6).



Figure 4: Spring wheat heads infested with the wheat midge



Figure 5: English grain aphids on wheat heads are similar in size and color to the wheat midge.

Economic thresholds for the wheat midge

There are no established economic thresholds for midge infestations in Washington State. In North Dakota, the thresholds are 1 midge per 5 heads for hard red spring wheat or 1 midge per 7 heads for durum wheat.

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North Dakota State University has a Wheat Midge bulletin at: <http://www.ag.ndsu.edu/pubs/plantsci/pests/e1330.pdf>

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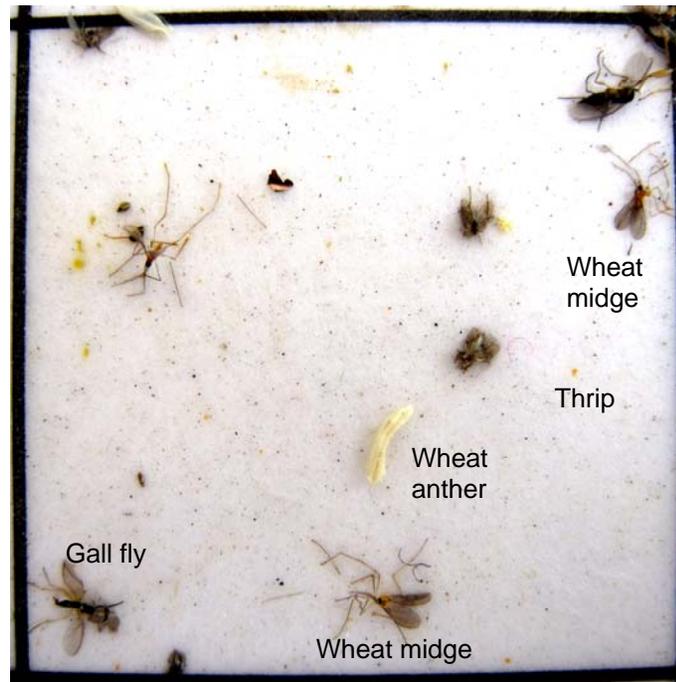


Figure 6. A variety of insects were captured in wheat midge pheromone traps in 2011. They included the wheat midge, gall flies, and thrips. They are all shown here for reference - to show relative sizes – and thus to aid in correct identification of the wheat midge. The black squares are 1-inch demarcations drawn on the sticky paper in the trap. T – they provide a further reference for the size of the insects.

