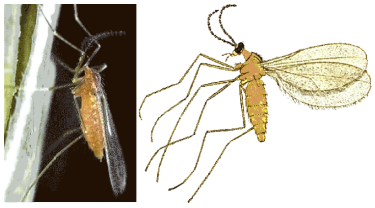
Small Grains



Orange Wheat Blossom Midge

Sue Blodgett

The wheat midge was introduced to North America in the early 1800s. Since that time, wheat midge has emerged as an important and damaging pest of Northern Great Plains and Canadian wheat production areas. In 1983 it was considered an important wheat pest of Saskatchewan and Manitoba and in 1996 an outbreak occurred in North Dakota. In Montana its traditional distribution is in the northeastern corner of the state; Sheridan, Daniels, Valley and Roosevelt Counties where its population density has remained at relatively low levels. However, wheat midge has recently been detected in northwestern Montana (Flathead County) at high population levels (100% crop loss). Infestations have not been seen in more southerly growing regions.

Identification (and life cycle/seasonal history)

The wheat midge is a small (approximately 3 mm long), delicate, mosquito-like fly that is orange in color. Adults emerge over a 4-6 week period around the time of wheat head emergence and flowering (late June through July). Females fly beginning at dusk when temperatures are above 59ºF and wind speed is below 6 mph. During the day, wheat midge prefers to rest within the humid crop canopy. Eggs are deposited on florets or developing kernels just before anthesis. Eggs hatch in 4-7 days and orange-colored larvae feed on developing kernels. Individual kernals can support several larvae. Larvae complete their feeding in 2-3 weeks, when they are 1/8" to ? ?and drop to the soil in August after either rain or a heavy dew. They burrow into the soil and overwinter in cocoons in the soil. In spring, the larvae pupate and emerge as adults. There is one generation per year.

The wheat midge cocoons are easily transported on soil adhering to cultivation or harvest equipment. Larvae can remain dormant in the soil for several years if conditions to induce pupation do not occur.

Plant Response and Damage

Wheat is the preferred host of wheat midge and is susceptible between heading and flowering stages. Barley is not susceptible to wheat midge. The larvae feed on the developing kernel, reducing grain size by 30 to 50 % per larva. In addition, damaged seeds are more susceptible to pathogen invasion, may fail to germinate, and may produce weak seedlings when they do germinate,

Monitoring

Wheat midges are attracted to wheat that is between heading and flowering. Monitoring efforts should begin with head emergence through completion of flowering. Scouting for wheat midge is best done by visually inspecting fields on warm nights (59ºF or above) at dusk (9-10pm), when females are flying

between plants to deposit eggs. Females fly in an irregular pattern over the canopy and tend to flutter between plants. Number of adults on 4 to 5 wheat heads should be counted on a minimum of 4 sites per field.

Wheat midge may be confused with Lauxanid flies, a much stouter yellow fly, more closely resembling a housefly and which has a much stronger, more direct flight pattern. Lauxanids tend to sit on plants horizontally or with their head pointing down where wheat midges ?generally sit on plants with their heads pointing up.

Degree day accumulations can also be used to determine when monitoring should begin. Based on Canadian data the threshold temperature for midge development is 40ºF. The following table indicates developmental stages of the wheat midge.

Table 1. Degree day progress of OBWM life cycle

Examine at least 4 locations in each field and take an average of the number of females seen per head. If 1 female per 4-5 heads is found, and 30% to 50% of the first heads are flowering, insecticide application will likely provide an economic return. **Optimum control will be achieved when 70% of the crop is in the heading to flowering stages.** At 30% heading, wait up to 4 days prior to application.

When more than 80% of heads are flowering, application is not recommended due to reduced insecticide efficacy and for protection of the parasitic wasp that attacks midge eggs.

Management Approaches

Treatment decisions can only be made from visual scouting. Sticky traps or pheromone traps may be used to detect midge presence but are not used for treatment decisions, as they do not provide a reliable estimate of population levels. Degree day accumulation can be used to initiate scouting activities. Based on North Dakota field observations, midge infestations were greatest when heading occurred during peak female emergence (1475 DD).

Crop rotation to winter wheat, barley or a non-host crop can prevent wheat midge population build up. Early seeding can advance crop development beyond wheat midge susceptible stages. **Later planted spring wheat crops are at the greatest risk for midge infestation.**

Chemical Control

Lorsban 4E at a rate of 1 pt/A is the only labeled material for wheat midge control. Applications should be

made in the late afternoon or early evening for best results. Check the label for gallonage recommendations.
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