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Burke County Extension

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SPRAYING FOR WHEAT STEM MAGGOT IN WHEAT

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In 2007 we saw an explosion in the numbers of white heads due to wheat stem maggot in the area. Wheat stem maggot can be found in area wheat and durum fields every year and even though they are very noticeable before the grain begins to ripen they do not normally cause an economic yield loss. However, when numbers explode like they did in 2007 that loss can be substantial.

NDSU Extension Entomologist, Janet Knodel says inquiries have been coming into the NDSU Extension Entomology office about whether to tank mix an insecticide with herbicide when spraying 4-6 leaf wheat for controlling wheat stem maggot. Here's a summary she provided of what we know to aid your decision-making.

Emergence: Based on preliminary research data collected from six sites in North Dakota in 2008, the first emergence of wheat stem maggot occurred at an average of 1240 accumulated growing degree days (AGDD), and the peak emergence occurred at an average of 1560 AGDD using a base of 32 F (wheat growing degree day base). Currently, most of the southern tier of North Dakota is at first emergence (or 1240 AGDD), while the northern tier has yet to reach 1240 AGDD (Fig. 1). As of June 12, Pat Beauzay of NDSU Extension Entomology observed the first adult wheat stem maggots in 4-6 leaf wheat at Fargo using a sweep net. It appears that adult wheat stem maggots are emerging right on schedule in the Fargo area. If we warm up to 70-80 F this week, we will accumulate about 20-30 GDD units per day. So, we should anticipate peak emergence in 10-15 days depending on the weather.

Sampling & Economic Threshold: It is easy to sample for adult wheat stem maggots using a sweep net in wheat fields. Adult flies are small (1/4 inch) long with a yellow-green thorax, black stripes on thorax and abdomen, square face and bright green eyes. The hind tibia is greatly enlarged. Although we are typically more concerned with spring wheat infestation by wheat stem maggot, winter wheat development is delayed this year and wheat stem maggot can also cause injury to winter wheat. So, consider scouting winter wheat as well as spring wheat this year. Unfortunately, no economic threshold for wheat stem maggot has been developed.

Biology: Wheat stem maggot attacks cereal crops including spring wheat (preferred), winter wheat, rye, barley, oats and native grasses. This pest has two to three generations per year. Wheat stem maggot passes the winter in the larval (maggot) stage in the lower parts of the stems of wheat and other wild grass hosts. They pupate in the spring and adults emerge in June. Females lay 30 eggs per individual on the leaves and stems of wheat and other grass hosts. Newly hatched maggots of this generation enter the leaf sheaths and tunnel into the tender tissues of the stem. Maggots feed for about three weeks before pupating. Another generation of flies emerges in midsummer to lay eggs in wheat or other grass hosts. The fall generation emerges in late August to early September and lays eggs in native grass hosts.

Control: Optimal insecticide spray timing is prior to peak emergence of adult flies, since insecticides should be directed against adults and newly hatched larvae before they enter the leaf sheaths and stems. Insecticide timing data indicate that spraying is effective at controlling wheat stem maggot from the 4-6 leaf stage through the flag leaf stage in 2008 (Table 1) based on white head counts. However, when populations of wheat stem maggot were low (average of 6% infested plants per field, source - 2008 NDSU Extension IPM Survey) as in 2008, there was no yield gain from spraying an insecticide regardless of spray timing (Table 2). In 2007, populations of wheat stem maggot were higher (average of 17% infested plants per field, source - 2007 NDSU Extension IPM Survey) and a yield gain of 10 bushel/acre was observed from spraying wheat at either 4-6 leaf or flag leaf.

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