



Pest e-alerts



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Check for Stored Grain Insects Even though it is Cold Outside

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A false premise is that since it is cold outside, there should be no insect activity in a grain facility. This is not necessarily the truth. The temperature of the grain mass inside the structure is the most critical aspect of insect activity, not the temperature outside. If you are relying on passive temperature movement (no aeration system), it may take a long time before the center of a grain mass equals the temperature outside the storage structure because grain is a very good insulator. If you have an aeration system on your facility and have used it to move cooler air through the grain mass, then you may have cooled the grain sufficiently to minimize insect activity.

How do you know if insects are active in your grain facility? You can use a grain trier (Fig. 1) to obtain probe samples from the grain mass. You will need to take several samples to make sure that all areas are sufficiently sampled since you are only sampling a very small portion of the grain mass (Fig. 2). Make sure to take samples from all areas, especially at the point where grain is loaded into a structure as this is where fine material accumulates and more insects are usually found in this area. Another method to sample for insects is to use probe traps (Fig. 3). This device is placed into the grain mass vertically just below the grain surface and left in place (Fig. 4). As insects move through the grain, they enter the holes on the side of the trap and fall down through a funnel where they are then trapped in the tip. After one week, retrieve the probe trap and dump the contents of the tip into a grain sieve to see if there are any active insects. This method is more sensitive in detecting insects than using a grain trier since it is continually sampling for seven days. Fewer probe traps will need to be used than the number of samples taken with a grain trier.



Fig. 1. Grain trier



Fig. 2. Using grain trier



Fig. 3. Probe trap



Fig. 4. Inserting probe trap

Permanent thermocouple cables in a grain facility should be checked weekly for temperature changes. If you notice an increase in grain temperature at one sensor location during cold weather outside, then this indicates that there is some type of biological activity occurring – insect activity and/or mold growth. This spot may become warmer and warmer with continued insect activity. It is important to break up the grain around a “hot spot” so that it can be cooled which may involve turning the grain mass. If this issue is not addressed, then insect feeding and reproduction can continue over the winter months and the grain will deteriorate further.

The initial goal for cooling grain is to reach a temperature of 60° F throughout the grain mass. At this temperature or below, most stored grain insects will not feed or reproduce. If the grain is remaining in storage through the winter months, then another cooling cycle is needed in mid-winter to lower the temperature in the grain mass to 30-35° F to reduce the insect activity further and equalize the grain temperature. The idea is to maintain a similar grain temperature throughout the grain mass.

If clean grain has been stored and the aeration fan is sized for 0.1 CFM/bushel airflow, then it will require about 120 hours of continuous fan operation to move the cold front completely through the grain mass. If the grain mass contains high levels of foreign material, then it will take the system longer (150 - 175 hours) to cool the grain completely. It is beneficial to use an automatic aeration controller to manage when aeration fans are in operation to take advantage of short duration cool weather. More details on using aeration to cool stored grain can be found in OSU Fact Sheet BAE-1101.

Paying attention to potential insect activity throughout the storage period, even during the winter months, is critical in keeping the grain at high quality. Having good quality grain at the time of market will only happen if regular insect monitoring occurs. Take advantage of the cold weather to help minimize grain loss from insects.

Disease and Insect Diagnostic Laboratory

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