

Time To Check Stored Grain For Insect Infestations

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A reminder that it is important to check the condition of on-farm stored grain at this time. Differences in grain mass temperatures of several degrees may indicate that insect and mold problems are present. If the grain mass was properly dried this past fall (to 12% or below) and temperature of the mass was reduced to 55 degrees Fahrenheit or below for storage during the winter months, then any insects present in the grain mass should be inactive. If the grain is to be held in storage into the summer months and no insecticide was applied in the fall, then the grain may be at risk from insect pests after just 3 to 6 weeks of storage once the grain mass temperature is warmed to above 60 degrees Fahrenheit necessary for summer storage. To determine if insects are present at this time, you should do a visual inspection of the top of the bin to see if any insects or insect damage is present. A sour smell, grain clumped together, the appearance of condensation present on the inside surface of the bin roof, webbing on the grain surface, or the presence of insect larvae, adult beetles or moths all suggest the presence of an insect infestation. Similarly, an inspection of grain from the interior of the grain mass is also needed.

Scouting methods differ by location in the bin and the presence of specific insect pests. Indianmeal moth infestations can generally be found by observing the top of the grain mass from the roof access door. If no webbing or foul grain odors are found, then it is unlikely that Indianmeal moths are present in high numbers. If the grain was properly leveled and the grain surface treated (capped) with an insecticide after filling of the storage structure the previous fall, it is best not to break or disturb the pro-

a problem in the end product is recommended. The grain should be fed to livestock prior to the arrival of summer temperatures when insect activity increases. If the grain is to be retained into the summer, then fumigation of the entire grain mass is a second, but less attractive management option. Producers can legally fumigate grain bins in Missouri providing they possess a valid private pesticide applicator license when purchasing and using the fumigants. However, due to the extreme hazard associated with the very poisonous gases emitted by the fumigation pesticides and the extreme danger if used improperly, it is strongly recommended that a professional fumigator be contracted to fumigate grain bins and other grain storage structures. A third option is to move the grain out of the storage facility to another storage structure with the grain being treated with a recommended insecticide as the grain is moved. When the grain is then warmed in the spring, the insecticide should provide satisfactory insect control on a short-term basis. Of these three options, immediate use of the grain as livestock feed is generally the best option. Once the grain is removed from the bin, sanitation procedures should be implemented and the empty bin treated with an approved insecticide both inside and out.

All insecticides labeled for stored grain insects have very explicit uses, requiring special attention during selection for various uses. Some insecticides are labeled for use in empty grain bins, but are not labeled for use on grain. Some insecticides are labeled for wheat- or corn only, whereas others may be labeled for both. Be sure to read and follow all label instructions, restrictions, and precautions when using insecticides for management of stored grain insect pests.

Moisture in the grain mass is one very important factor which attracts insect pests to these structures. Charles Ellis, a Regional Extension Engineering Specialist with the University of

Table 1. Stored Grain Insecticides for Direct Application to Specific Grain

Common Name	Trade Name	Rate of formulated material per acre	Placement
pirimiphos-methyl	Actellic SE	9.2 to 12.3 fl oz per 1,000 bu	Corn, grain sorghum
chlorpyrifos-methyl + deltamethrin	Storicide II	11.6 fl oz per 1,000 bu 12.4 fl oz per 1,000 bu 9.9 fl oz per 1,000 bu 8.6 fl oz per 1,000 bu	grain sorghum wheat barley oats
Labeled Fumigants by Grain			
	Phostoxin or Fumitoxin	tablets: 40-80 per 1,000 bu pellets: 200-300 per 1,000 bu	corn, grain sorghum, wheat, barley, oats

Comments: Storicide II not labeled for use on corn; Actellic SE only labeled for corn and grain sorghum. Fumigation best accomplished by professional commercial pesticide applicator. Be sure to read the label and follow all directions, precautions, and restrictions.

ductive cap of insecticide previously applied at that time. Some probing of the grain surface from the access door may be necessary to determine level of insect infestations if found. Scouting for stored grain insects in the grain mass can be accomplished by using a grain probe to collect samples from the side access panel. Grain collected should be placed in a quart glass jar, plastic bag, or some other container through which insects can be seen if they are present in the grain. These containers of grain should be placed in a warm area to allow the grain to warm to at least 60 degrees F or higher in order to stimulate insect activity. Although there are no reliable thresholds for most insects found in stored grains, it is usually considered that if insects are found in the 1 quart samples of grain collected, the grain content of the bin should be either quickly used before grain quality is diminished by insect activity or treated (fumigated) to kill insects present in the grain and prevent excess loss of grain quality when stored at summer temperatures.

If an insect infestation is found on the surface of the grain mass and webbing is present, this usually indicates the presence of Indianmeal moth. As this insect only damages the upper 12-14 inches of the grain mass, removal of the webbing and damaged grain along with an application of a labeled insecticide are recommended. Pest strips (dichlorvos or DDVP) hung above the grain mass inside the storage structure may help prevent Indianmeal moth infestations by controlling the moth stage of this common pest. If an infestation of various flour beetles, grain weevils, or other stored grain beetles is found infesting the cold grain mass, then the immediate use of grain for livestock feed or some other use where the insects do not cause

Missouri, discussed the aeration and moisture zones in on-farm grain storage facilities in the January 15, 2009 issue of Insect Pest & Crop Management (Volume 19, Number 1). Proper aeration of the grain mass to manage moisture and grain mass temperature is essential for good insect control. It is important to note that it often requires a week or more of aeration to move a moisture layer through and out of a grain mass depending on several factors. These include the volume of air moved, the size of the storage structure, and the temperature of the air being moved into or out of the grain mass. If a grain mass was properly cooled to 50-55 degrees F in the fall, then the grain mass must be properly warmed in the spring to prevent the formation of condensation and moisture damage during summer. A second article discussing moisture management in grain bins and several other important harvest concerns for onfarm grain storage was written by Tom Dorn, an extension educator associated with the University of Nebraska. His article can be found here: <http://cropwatch.unl.edu/web/cropwatch/archive?articleID=989014>.

Color images and additional information concerning proper management of common stored grain insects can be found on the Commercial AG Electronic Bulletin Board at <http://agebb.missouri.edu/storage/pests/insect.htm>.

Listed on page 16 are insecticides currently labeled for use directly on grain. Be sure to match the proper insecticide to the grain crop listed on the specific pesticide label. Please note that fumigants offer no residual protection from insect damage and that proper fumigation is best completed by professional pesticide applicator. Δ

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