Stored Grain

Foreign Grain Beetle

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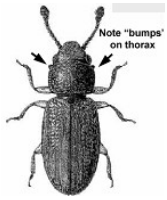

Foreign Grain Beetle.

Introduction

(*Ahasverus advena*) These species are thought to not feed readily on the grain itself, but on fungi that grow on high moisture grain, as well as on the surface of fine material and higher moisture weed seeds. Their presence is an indication of a higher moisture condition, and possibly moldy grain.

In Montana, adult beetles of these species fly into newly-stored wheat, where they feed on molds associated with the newly-stored grains, where females will deposit their eggs. The larvae will continue to actively feed on fungi and other fine material. However, these beetles are unlikely to damage stored grain and a population cannot survive the winter in Montana. Their presence in a bin indicates attraction to small amounts of moldy field grain in early storage. Well-managed grain will not remain infested with these beetles, particularly if the grain moisture content is maintained at less than 13% and the temperature declines.

Biological Control

There are a number of insect predators and parasitic wasps that attack insect pests of stored grain. All are effective if used in overwhelming numbers. However, biologicals are generally not used because the Food and Drug Administration (FDA) and food processors do not accept live insects or insect parts in raw grain. This inudative approach is simply the addition of very large numbers of beneficial insects.

Biological agents have limited commercial avail-ability and are cost prohibitive, except perhaps for organic production. Specific species that attack the different groups of pests are listed below. It is important to note that there are limited numbers of naturally occurring biological control agents:

Primary Pests

Parasitic wasp of grain
Anisopteromalus calandrae
Choetospila elegans
Lariophagus distinguendus

Predaceous mites
Warehouse pirate bug - *Xylocoris flavipes*

Secondary Pests
Predaceous mites
Warehouse pirate bug - *Xylocoris flavipes*

Indianmeal moth
Habrobracon hebetor
Predaceous mites
Trichogramma pretiosum
Warehouse pirate bug - *Xylocoris flavipes*

Insecticide Treatments

Empty bin treatments include residual insecticides applied in and around the fan, aeration ducts, auger, door openings, and hatch covers, or fumigants, before bins are filled at harvest. Commercial facilities must comply with the Occupational Safety and Health Administration (OSHA) bin entry permits. Following are pesticides available for treating empty bins:

Insecticides Labeled for Use as Empty Bin Treatments

Active Ingredient (a.i.)	**Example Brands**	**Comments / Usage**
Cyfluthrin	Tempo Sc Ultra Premise Spray®	Most effective residual as compared with malathion and chloripyrifos-methyl.
Chlorpyrifos-methyl	Reldan 4E®	Can only be applied from outside of bin and sprayed downward into the bin. Degrades on hot surfaces.
Diatomaceous earth (DE)	Insecto, Protect-it®	Excellent empty bin treatment. Special grade required for grain use. Must use DE labeled for grain.
Malathion	Malathion	No longer recommended for empty grain bins because of high insect resistance and rapid degradation in warm, relatively moist grain.
Chlorpyrifos-methyl + cyfluthrin	Storcide®	Can only be applied from outside of bin and sprayed downward into bin. It is not

		recommended for grain intended for export.
Chloropicrin	Chlor-o-pic®	Empty bin fumigant, under false floor, aeration tubes, and tunnels.
Methyl bromide	Brom-o-gas®, others	Empty bin fumigant; seldom used.
Phosphine	Phostoxin®, others	Empty bin fumigant.

Liquid Insecticides Labeled for Use as Grain Protectants

Active Ingredient	Example Brands	Comments
Chlorpyrifos-methyl	Reldan 4E®	Reldan does not control lesser grain borer. Can only be applied to the grain stream as it is moved (augered) into the bin. Use limited to existing stocks.
Malathion	Malathion 5EC	Existing stocks are available but label has been withdrawn. Most stored grain insects are resistant.
DDVP	Vapona®	Also as strips. Used in the head space against Indianmeal moth.
Methoprene	Gentrol, Diacon II®	Kills developing insects only, slow kill of larvae, no kill of adults though causes sterility. High cost and must use other products before sale. Newly marketed.
Chlorpyrifos-methyl + cyfluthrin	Storcide®	Can only be applied to the grain stream as it is moved (augered) into the bin. It is not recommended for grain intended for export.
Pyrethrins	Pyrenone®	Expensive, short residual life.

Grain protectants are insecticides applied directly onto grain going into the storage or already in storage. Grain protectants do not kill insects inside the kernels. Following are insecticides labeled as protectants.

In Montana, the use of protectants should be limited to high-value commodities that need protection during storage for several months, and for which it is cost effective to use them. For direct application on wheat at first storage, there are limited circumstances where the use of a protectant is necessary.

Dust Insecticides Labeled for Use as Grain Protectants

Active Ingredient	Example Brands	Comments
Malathion	Big 6 Grain Protector®, Agrisolutions 6% Malathion Grain Dust	Top-dress treatment. Insects are resistant in many areas. Millers resist purchasing grain with strong malathion odor.

Diatomaceous earth (DE)	Protect-It™, Insecto®	Can lower the test weight of grain and is expensive if it is applied to entire grain mass, so is best applied to empty bins and to the top and bottom layers of the grain mass.

Categories: Stored Grain, Insects, foreign grain beetle, Ahasverus advena

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