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Controlling Stored-food Pests In the Home

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Three keys to reducing problems with stored-food pests:

- Proper buying
- Proper storage
- Good housekeeping

The ability to store food has helped our ancestors to survive and live more comfortably. Home storage of food is still a useful, necessary practice, even though we no longer face the same problems of survival. We do, however, share with our ancestors one continuing problem, the presence of insect pests in stored food.

Discovering "signs of life" in home stored grain, flour or dry food products is frustrating. The insect pests that most commonly infest food items include sawtoothed grain beetles, flour beetles, Indian meal moths and carpet beetles (see Figs. 1-4 next pages). Collectively they are often referred to as "flour weevils." This is misleading since true weevils are seldom found, and when they do occur, true weevils infest many food items besides flour.

The life cycles of the common food pests vary with different conditions, but they all need food. Their food source includes all dry food products stored in the home, including pet foods and animal fibers

Thousands of dollars are spent on home food storage in today's society. Much is wasted because of

insect damage during storage. Most damage can be prevented through proper buying and careful attention to storage conditions.

Inspecting the home for food pests

Insects that infest food are found almost everywhere. To minimize or prevent infestations, keep the kitchen, pantry and other food storage areas clean and free of spilled flour or cereal products.

When an infestation is discovered, the first step is to inspect the home to determine the source. **This is most important!** Usually insect problems begin in the kitchen or pantry where most food items are kept. Examine all potential sources such as prepared cereals, flour, garden seed, dry milk products, dry pet foods and livestock feeds. Be sure to inspect behind and under cupboards, cabinets, drawers and appliances where food particles may have accumulated. Mounted trophy birds, game heads, hides, feathers, old furniture and wool carpets are frequently the source of carpet beetles.

In persistent cases where the infestation source remains a mystery, look for external sources, including bird and rodent nests. These same insect pests come from leafcutting bee boards, honey bee boxes and farm seed stored near the home. Once the insect source is located, it must be discarded, removed or treated to control the pest.

Protection of kitchen and pantry areas

- Step 1.** Remove all dishes and foods before cleaning and treating storage for insect control.
- Step 2.** Remove paper or cloth shelf coverings for cleaning. Insects hide under such covering.
- Step 3.** Use a vacuum cleaner to clean debris from cracks and corners of storage areas. Discard the vacuum bag when finished.
- Step 4.** Scrub storage space and vicinity with very hot water and a strong detergent solution. Allow to dry.
- Step 5.** Spray the cupboards and shelves with one of the household pressurized sprays containing chlorpyrifos (Dursban), tetramethrin, sumithrin or pyrethrum. **Select one that states on the label that it is for crack and crevice spraying to control carpet beetles, ants, etc., in cupboards and cabinets in homes.** Follow label directions and be sure that all crevices and joints are thoroughly wetted with spray. Do not spray food, dishes or utensils. Do not spray counter tops where food is prepared.
- Step 6.** Ventilate room and allow two hours drying and airing time. If shelf coverings are used, replace with new ones.
- Step 7.** Wash flat surfaces of cupboards again with clean water to remove extra residue and odor.
- Step 8.** Place food in tightly covered containers before returning to storage even though the food does not appear to be infested. Then you will be certain it cannot reinfest other food.



Fig. 1. Sawtoothed grain beetle, adult.

Regularly inspect your cupboards and storage area to determine if treatment is necessary. Retreatment may be necessary to kill larvae or beetles that were missed or that emerged from protected egg or pupal shells after the initial spray.

Prevention in small quantity storage

Dry food items in the kitchen or pantry must be stored in secure metal, glass or hard plastic containers. Tight fitting lids are a must. An added virtue to tight fitting containers is that if an infested food item escapes detection, it will be confined to that container and not spread to other areas.

Prevention in large quantity storage

Many people store bulk lots of wheat, rice, beans, dry milk, etc. The best protection available for your stored foods is a good pest prevention program. This should be a major consideration since improper storage can result in total loss to insects, rodents or moisture.

Proper buying — Purchase clean insect-free grains. Preferably, buy grains prepared especially for home storage. Some companies have grain available in sealed metal containers, but these are expensive. Bulk buying of specially cleaned grain is acceptable if it is placed in permanent storage containers immediately after purchase. Moisture content should be 10 to 12 percent or less.

Proper storage — Food in open containers is almost certain to become infested. Storage in plastic, burlap or cloth sacks is poor protection against insects, mice or moisture and is not recommended.

PESTICIDE RESIDUES: These recommendations are based on current labels for each pesticide listed. To avoid excessive residues, follow label directions carefully with respect to rate and number of applications.

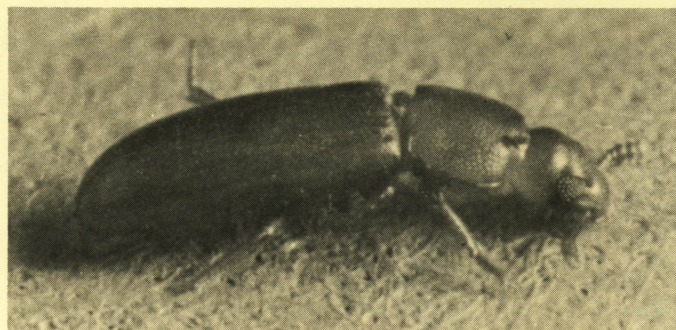


Fig. 2. Red flour beetle, adult.

Store grain in airtight containers. Several types of metal or hard plastic 5-gallon cans are available, but only "food storage" grade containers should be used. Plastic containers designed for trash disposal should not be used because the plastic may contain harmful chemicals. A 5-gallon can will store approximately 35 pounds of grain.

Use plastic bags designed for food storage as additional moisture protection inside the metal or hard plastic cans. When used separately, plastic bags offer little protection against insect infestation. Regardless of type or size of storage can, tight fitting lids are a necessity.

Store grain in a clean, cool, dry place, at least 18 inches off the floor and away from damp areas. Rotate the supply frequently so that the older grain is consumed first. Use a permanent marker to write purchase dates on the containers.

Good housekeeping: A necessity

Keep food storage areas free of spilled food, grain or flour. Wheat grinding equipment must be kept clean when not in use. Wipe excess flour from grinder and vacuum immediately after use. Old dry-food products and pet foods should be discarded if there is no longer a use for them. Periodic inspection and cleaning of areas behind shelves and appliances will help prevent food particle accumulation. Animal products such as hides and feathers require occasional dusting and treatment with appropriate insecticides

to maintain good condition. In summary: Good housekeeping prevents insect infestations.

Insect control

Often it is not necessary to destroy lightly infested grain or flour products. In small quantities, such products can be treated by:

Heating — Heat oven to 140°F. Put grain or flour in shallow pan and place in oven for 30 minutes. Microwave treatment on high setting for about 10 minutes will also destroy the insects. Both processes will destroy the grain's germinating ability.

Freezing — Place small packages in freezer at 0°F or below for a minimum of 4 days. Leave larger packages for at least 7 days. This process may cause excessive moisture in the product if it is defrosted in a humid room.

Insecticides should never be used to treat food items directly and should be used very cautiously in areas where food items are stored. Several household aerosol sprays can be used to reduce infestations of insects, including stored-food pests. Barrier sprays around doors and windows prevent entry of potential pests. Certain insecticides can be used for crack and crevice treatment in food storage areas, but it is critical to read the pesticide label and determine the proper uses before and after buying.

Dry ice for home grain fumigation

It may not be possible to purchase insect-free grain and cereal products or to be certain of noncontamination. In such cases, grain must be treated after purchase but before long-term storage.

Dry ice is not the most effective fumigant for controlling stored-grain pests but, if used carefully, it is one of the safer compounds available for home use.

To fumigate home-stored wheat or similar products, spread about 3 ounces of crushed dry ice on 3 or 4 inches of grain in the bottom of a 5-gallon container, then add the remaining grain to the can



Fig. 3. Indian meal moth, larva and damage.

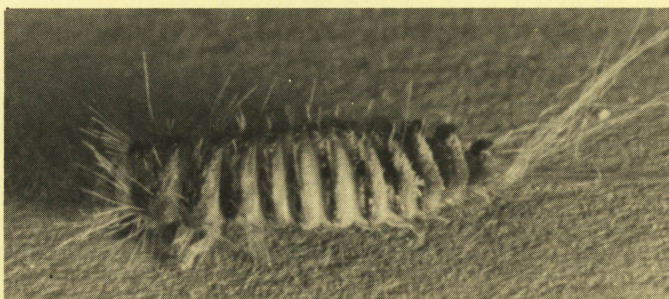


Fig. 4. Carpet beetle larva.

until it is the desired depth. To fumigate large quantities, use 8 ounces for 100 pounds of grain or 1 pound for each 30 gallons of stored grain.

Since the gas from vaporizing dry ice is heavier than air, it readily replaces the existing air in the container. Keep the container lid loose until the dry ice has vaporized and replaced the air. Then firmly place the lid on the container.

If pressure causes the can to bulge after the lid has been put in place, cautiously remove the lid for a few minutes to release the pressure and then replace it. If you have plastic bags in the can, do not seal the bags until the dry ice has vaporized. Carbon dioxide will stay in metal or glass containers for some time if the container lid is tight.

When practical, use the dry ice procedure in a dry atmosphere to reduce the condensation of moisture in the bottom of the can. If done properly, one treatment should be enough. Yearly treatments are not needed unless an infestation is found.

Dry ice will control adult and larval insects but may not kill the eggs or pupae. A tight fitting lid placed

firmly on the container as soon as the dry ice has vaporized may keep enough carbon dioxide inside to kill the eggs and pupae.

CAUTION: Dry ice should be handled with care. Skin can be severely frozen if it is handled improperly. Dry ice should not be accessible to children or adults who are unaware of its freezing or vaporizing properties. Do not use in closed room where carbon dioxide may replace air and cause asphyxiation.

Repellents

Homeowners have used bay leaves, spearmint and peppermint gum and other scented items to repel grain insects, with the claim of many years of insect free storage. The authors have not experienced good results from these repellents in controlled test situations. Therefore, we do not recommend reliance upon them.

Proper buying, storing and housekeeping are still the best methods to beat stored food insect problems.

To simplify information, trade names have been used. No endorsement of named products is intended and no criticism is implied of similar products not mentioned.

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