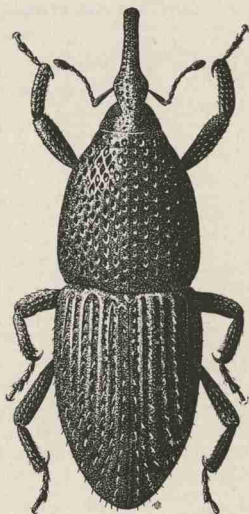


Rice Weevil (adult)



Granary Weevil (adult)

CONTROL OF STORAGE PESTS ON THE FARM

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CONTROL OF STORAGE PESTS ON THE FARM—1956

WALTER M. KULASH

GRAIN	PESTS	CONTROL
Corn	Angoumois grain moth Indian-meal moth Rice weevil Granary weevil Flour beetles Cadmelle and other insects.	<p>BIN TREATMENT.—Clean out before new crop is stored. Spray walls, floors, and ceilings with 2½% DDT, or TDE or methoxychlor made from wettable powder or emulsifiable concentrate. Separate poor corn from good corn and use poor corn first. Check corn frequently to observe insect conditions.</p> <p>SHELLED CORN.—Best results obtained on dry (12% moisture) corn using any 1 of fumigants listed below (see "Small Grains") at 5 to 7½ gallons per 1000 bushels of shelled corn, depending on tightness of storage place. Apply with watering can or spray on surface of corn. Seal all cracks and holes and keep under fumigation for 48 hours. Use gas mask.</p> <p>Some control possible with a 0.05% pyrethrum and 0.80% piperonyl butoxide dust at 100 lbs./1000 bushels shelled corn. Clean corn treated with dust before using for feed or food.</p> <p>EAR CORN WITH HUSKS.—Practice proper sanitation and chemical treatment of bins before grain is stored. Use poor corn first. Fumigation too costly because of absorption of gas by husks and not practical in slated cribs. Pyrethrum-piperonyl butoxide dusts do not control insects under husks.</p> <p>SEED CORN.—Dust with 5% DDT at 1 oz./bu. or treat in a commercial slurry treater at rate of 2 oz. of 75% wettable powder DDT in gallon of water applied at rate of 20 "dumps" or "trips" of about 1 fluid oz. each per 100 lbs. of shelled corn. Do not feed DDT slurry-treated corn to poultry or livestock.</p>
Pop Corn	Angoumois grain moth Indian-meal moth Rice weevil and other beetles.	Dry, clean and shell corn and store in insect-tight containers to avoid infestation. For bin storage, fumigate as described under small grains. For small lots, use any 1 of 4 fumigants listed under "Small Grains" at rate of 2 tablespoonfuls (1 oz.) of fumigant to 2 bushels (100 lbs.) of corn. Use gas-tight metal can for fumigating small lots. Keep sealed for 24 hours. Air thoroughly after fumigation.
Cereals and Grain products	As in corn and small grains. ("Pantry pests")	Keep storage places clean and free of loose food products. Spray shelf and storage areas with a pyrethrum refined oil base household spray. Do not apply spray to food products. Do not store paper or cloth packaged food products for long periods. Infestations in small lots of cereals and grains may be controlled by heating for 30 minutes at 145° F. or by fumigation in a tight container (See "Pantry Pests" under "Household Pests").
Cured meat	Cheese skipper	Cure meat in winter and bag immediately after washing or smoking. Black pepper helps to dry meat but does not control skippers. Wrap meat in good grade of Kraft paper, place in cotton sack free of holes, hang from single strand of wire and cover with quarter-barrel size Kraft paper bag and tie mouth of bag tightly around wire strand.
Small grains Wheat Oats Grain sorghums (milo) Feed products	As under corn and in addition numerous other beetles, such as lesser grain borer, mealworms, saw-tooth grain beetle, flat grain beetle, and mites.	Fumigate with any 1 of the 4 fumigants listed below. Pour over surface of grain. Seal all cracks and holes. Keep under fumigation at least 48 hours with temperature in grain of 60° F. or slightly higher for best results. Use gas mask with proper canister and observe all fumigation precautions. (See N. C. Agri. Exp. Bul. No. 389). Air out grain or feed thoroughly after fumigation and before using.

TABLE OF FUMIGANTS AND RATES

FUMIGANT	TYPE OF BIN	Gallons per 1000 Bu. Grain		
		Shelled Corn	Small Grains Except Sorghums	Grain Sorghums (Milo)
1. "4 to 1 mix" or an "80 to 20 mix" (4 parts carbon tetrachloride to 1 part carbon disulfide)	Metal or concrete	5	1½-2	6½
	Wood	7½	2½	8
2. Mixture of 3 parts ethylene dichloride to 1 part carbon tetrachloride.	Metal or concrete	5	3-4	8
	Wood	7½	6	10
3. Carbon tetrachloride.	Metal or concrete	5	3	6½
	Wood	7½	6	8
4. Mixture of: 5% ethylene dibromide 35% ethylene dichloride 60% carbon tetrachloride	Metal or concrete	5	2-3	6½
	Wood	7½	6	8

In addition to fumigants, a 0.08% pyrethrum and 1.15% piperonyl butoxide dust mixed on wheat flour is available for treatment of wheat only. Apply at rate of 75 lbs. to 1000 bu. of wheat.

**CONTROL OF STORAGE PESTS IN ELEVATORS,
WAREHOUSES, AND OTHER TYPES OF STORAGE**

The same insect pests that attack feed and food on the farm are also found in large storage areas. Proper sanitation and bin or area treatment with a spray is essential to safe insect-free storage. A good rule to follow is to fumigate all grain as it comes in. Frequent checks should be made on the condition of the grain in storage. Turning of grain in elevators will help to improve the condition of the grain and lessen the possibility of insect damage.

Different types of large storage places require different methods of chemical treatment but the general rules of sanitation and good house-keeping apply equally well to all types of storage on the farm as well as in commercial storage.

ELEVATORS.—The following fumigants may be used at the rates indicated:

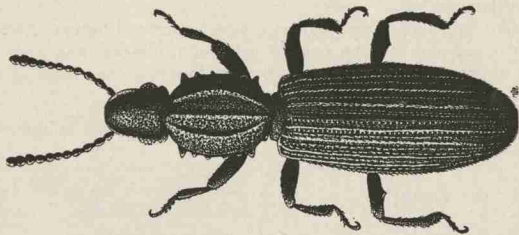
Fumigant	Gals. Fumigant per 1000 Bu. Wheat in Steel or Concrete Elevator Bins (to 50 ft. depths)		
	80°F.-higher	70°F.-80°F.	60°F.-70°F.
1. "4 to 1 mix" ("80 to 20 mix")	2	2½	3
2. "75-25 mix" (3 parts ethylene dichloride to 1 part carbon tetrachloride)	4	5	6
3. Mixture of: 5% ethylene dibromide 35% ethylene dichloride 60% carbon tetrachloride	2	2½	3

Fumigant may be applied in a steady flow to the grain stream or with an extra "capping" dosage of 2.3 gallons in the last 1,000 bushels—or—may be applied to surface of grain.

WAREHOUSES.—Spray walls and floor with DDT, TDE, or methoxychlor as described under “Bin Treatment.” Stack bagged grain in 2 rows, 6 inches apart and 4 bags high. Pour fumigant over surface of bags with watering can and cover with polyethylene plastic tarpaulin immediately and batten down around pile with “sand snakes” to keep gas enclosed. Use any of the 3 fumigants listed above at the 60°F.-70°F. dosage rate.

Methyl bromide, with chloropicrin added to it as a warning agent, can be applied through a tube from a 1 pound pressurized can or a bulk tank to the surface of grain enclosed in a polyethylene tarpaulin. A 1 pound can will treat approximately 1,000 cubic feet—that is, a pile of bagged grain 2 rows wide (7 ft.), 5 feet high, and 25 feet long. Observe all precautions in fumigation. Use a gas mask with a yellow canister when fumigating with methyl bromide. Provide ample ventilation when covers are removed 24 hours after treatment.

FLAT OR BULK STORAGE.—Clean out storage area and treat walls and floor as described under “Bin Treatment.” Fumigate only where floor and walls are gas-tight. Level mass of grain and pour fumigant on surface using fumigants as in “warehouse fumigation” at the 60°F. dosage rate. Cover with polyethylene tarpaulin for 24 hours or more.



Saw-Toothed Grain Beetle (adult)