

How to Stop "Weevil" Damage in Stored Grain

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GRAIN held for any length of time in farmers' bins is almost sure to become infested with insects, with consequent loss in seed value, weight of grain, quality, and reduction in grade. The best measures for controlling stored-grain insects and preventing damage are cleanliness and fumigation. Measures to *prevent* infestation will have to be taken before the grain is in the bins.

Much insect damage is due to the fact that bins are not thoroly cleaned before the grain is stored. Bins should be thoroly cleaned out, all waste grain removed from the cracks, corners, and floors of the bins. If a bin has been infested, spray it thoroly with ordinary or deodorized kerosene. Clean the bin of all waste grain on the outside as well as the inside.

Grain should be threshed in the field as promptly as possible. In southern Illinois, in years following mild winters, a considerable



FIG. 1.—Before fumigation the grain in the bin is leveled off in order that the very heavy gas given off by carbon bisulfid will penetrate uniformly down into the grain.

amount of grain in the shock may be infested in the fields if it is not promptly threshed.

Once the grain is in the bin and has become infested with insects, fumigation is the only practical method of stopping damage. Several fumigants for fumigating grain in cars or grain in elevators have recently been developed, but they are not practical for use in farmers' grain bins.

Fumigation With Carbon Bisulfid

Carbon bisulfid is the best fumigant, all things considered, for farmers' grain bins, or for piles of feed that can be kept in a tight



FIG. 2.—The amount of carbon bisulfid required to fumigate the bin is poured on burlap sacks placed on the surface of the grain.

room or container. It is a nearly colorless, ill-smelling liquid that changes to a gas very rapidly when exposed to the air at ordinary temperatures. The gas is much heavier than air and sinks to the bottom of any container in which it is used. The gas is deadly to all forms of insect life if used in sufficient strength and at temperatures in which the insects are active.

Carbon bisulfid should be used at the rate of 1 pound to each 100 cubic feet of space in large tight bins or 1 pound to each 80 bushels of grain. In small bins where there may be some leakage, use 1 pound to each 50 bushels of grain.

To use this gas, first have the sides and bottoms of the bins, rooms, or containers to be fumigated as nearly air-tight as possible (the average grain bin is very far from air-tight). Where there is sure to be some leakage, the amount of carbon bisulfid must be increased. Never

attempt to fumigate a room or bin with large cracks or openings in the bottom or sides.

The best results with carbon bisulfid will be obtained at temperatures of 75° to 90° F. Do not attempt to fumigate when the temperature is below 60° F. The liquid may be applied directly to grain or seeds, but better results will be obtained by spreading gunny sacks on the grain and then pouring the carbon bisulfid on them. This gives a rapid evaporation which is more effective than when the liquid is exposed in pans on the surface of the grain. While not necessary, it is better to cover the top of the bin with a tarpaulin or blanket. Keep the room closed for 36 to 60 hours. This treatment will not injure the milling qualities of grain and will leave no poisonous residues on feeds.

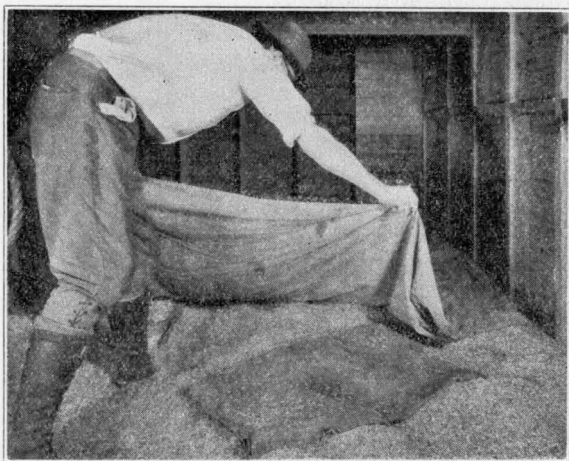


FIG. 3.—After applying carbon bisulfid cover the grain to confine the gas. Leave the bin at once after covering the grain.

Small quantities of seeds may be fumigated in tight barrels. Never pour the liquid directly on the seeds, as it is likely to injure the germinating qualities. Seeds will not be injured by fumigation at a strength of 1 pound of carbon bisulfid to 100 cubic feet of space, but they should not be exposed to the gas for more than 36 hours.

As this gas is poisonous to human beings, one should leave the bin or room as soon as possible after applying the liquid. Always ventilate thoroly before entering any place that has been fumigated.

The inflammable nature of this gas must always be kept in mind. When mixed with air it is very explosive. Even a spark caused by striking a nail with a hammer is sufficient to cause an explosion.

This material can be obtained from many of the larger dealers in insecticides at prices ranging from 9 cents to 12 cents a pound, depending on the quantity purchased.

Fumigation With Hydrocyanic Acid Gas

Empty grain bins may be cleaned of all insect life by fumigating with hydrocyanic acid gas. This gas should be used only by persons thoroly familiar with its properties, as it is deadly to all forms of animal and plant life. Special directions for the use of this gas will be sent upon request to anyone wishing them.

Commercial Fumigants

Several prepared fumigants are now on the market, which are not inflammable and which are quite effective. Before buying any of these prepared fumigants, however, be sure that they have been thoroly tested and that the company selling them will guarantee their product to give a satisfactory kill of insects.

Sulfur fumes are of very little value in treating stored grain. Formaldehyde is of no value in treating stored grain or seeds.

Application of Heat

In all life stages grain insects are killed if exposed for several hours to a temperature of 125° to 135° F. Exposure to such temperature for not over six hours does not injure the germinating qualities of seed if it does not show over 12% moisture. Above this temperature, however, there is danger of injury.

In large bins of grain it is hard to get an even distribution of heat, the temperature becoming too high in the outer layers of the grain before it reaches a sufficiently high point to kill insect life in the middle of the bin. When heat is to be used with large quantities of grain, it is best to pass the grain thru heating machines. Such machines, if properly constructed, will raise the temperature of the grain run thru them to a point sufficiently high to kill insects in all stages.

Hydrated Lime

Soybeans and cowpeas that are held over from one year to another may become infested by one of the pea or bean weevils or by one or two of the common grain moths. Quantities of such seed piled in bins can be protected by covering with a layer of hydrated lime to a depth of about half an inch; or small quantities of such seeds may be protected by mixing one part of hydrated lime with four parts by weight of beans or peas. This should be done immediately after thrashing.

This treatment will not injure the germination value of the seeds.

Not all insects found in grain bins cause damage to grain. Farmers who find insects, the importance of which they are not sure, are invited to send specimens to State Entomology Building, University of Illinois, Urbana, for identification.