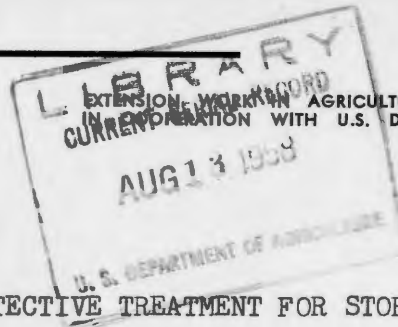


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1958
AGRICULTURAL EXTENSION SERVICE

State College of Washington · Pullman



E.M. 1915
July 1, 1958

MALATHION (PREMIUM GRADE) AS A PROTECTIVE TREATMENT FOR STORED GRAIN

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The following recommendations for malathion as a protective treatment for grain were made possible by the research conducted by the Department of Entomology at Washington State College in close cooperation with the Entomology Departments of Oregon State College and the University of Idaho. The Stored-Product Insects Section, Marketing Research Division AMS, of the United States Department of Agriculture concurs in these recommendations. The value of the malathion treatment has been substantiated by research conducted by USDA and by the University of California at Riverside.

Malathion is a highly effective, safe, and inexpensive material for controlling the most common stored-grain insects in the Pacific Northwest. Although it is especially useful for grain that is to be stored for several months, it can also be used for shorter storage periods. It is particularly useful for flat storage where fumigation or turning is difficult.

The U.S. Food and Drug Administration has set a tolerance of 8 p.p.m. of malathion in stored grain, wheat, barley, oats, rye and sorghums. The USDA has approved registration at one pint of the 57% premium grade malathion (5 lbs./gal.) emulsifiable concentrate in 2-5 gallons of water per 1,000 bushels of grain or as a 1% dust at 60 pounds per 1,000 bushels. When applied at either of these rates, the grain would have a calculated deposit of approximately 10 p.p.m., 2 p.p.m. over the established tolerance. Extensive residue determinations, however, have shown that treated grain will lose a part of the malathion very soon after treatment. Therefore, if the grain is not shipped within two weeks after treating, the residues will be below the allowable 8 p.p.m. tolerance.

The moisture content of grain is an important factor in relation to the effectiveness of the protective treatment. The malathion treatment is considerably more effective on low moisture grain. Poor results were observed on grain with 14½% moisture. Grain stored between 9 and 11 per cent moisture can be protected without difficulty. USDA tests in Kansas gave good results with grain having a moisture content as high as 12½%.

Either the dust or liquid formulations are effective but the former is objectionable because of loss during loading, and it increases the amount of dust already present in grain. The liquid formulation adheres better to the grain and will not materially increase the grain moisture. The cost of the spray formulation should not exceed two-tenths of a cent per bushel; the dust treatment may be slightly more.

Off Odor: Use only premium grade malathion

Use only premium grade malathion on grain, and the emulsifiable concentrate formulation, if used, should not be over six months old. Off odors have been produced in grain when

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the agricultural or standard technical grade was used. This is the type normally applied on plants. It is very important that only fresh premium grade malathion be used for grain treatments. Do not apply old malathion or agricultural grade material on the grain.

Directions for use

Spray: Use 57% premium grade malathion (5 lbs./gal.) emulsifiable concentrate diluted at the rate of one pint to 2-5 gallons of water/ 1,000 bu. ($\frac{1}{2}$ pint for oats). The spray can be applied as the grain is being loaded or turned into final storage. Any of the standard applicators on the market which can be calibrated to deliver a known volume of spray at this rate are suitable for applying malathion.

For small amounts of grain in farm storage where special application equipment is not available, any type of low pressure sprayer holding a gallon or more can be used. The spray can be applied to the grain stream either when the grain is being elevated into storage or as the grain is moving from the combine to the truck or wagon. The first step would be to test spray a tank of water to determine the rate at which the sprayer is discharging, then regulate the flow of grain to get on the proper amount of spray. Adjustments can also be made in the size of the nozzle or the operating pressure of the sprayer in order to compensate for the rate of flow of the grain. Be certain of your dosage. Too much may cause excessive residues. Too little may not give desired control.

Dust: Use 1% premium grade malathion dust at 60 pounds per 1,000 bushels (30 pounds for oats). Apply as the grain is being loaded or placed into storage.