EC-7

GRASSHOPPER CONTROL *IMPROVED* BY NEW INSECTICIDES

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GRASSHOPPER CONTROL IMPROVED BY NEW INSECTICIDES 1/

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Sprays and Dusts

Many farmers are now using sprays or dusts containing new organic insecticides for grasshopper control instead of broadcasting bran-sawdust-sodium fluosilicate bait. Of the various new chemicals that have been thoroughly tested, chlordane and toxaphene have performed the best.

These new insecticides give quicker and better initial control and continue to kill longer than the standard sodium fluosilicate bait. They are particularly effective when applied as sprays or dusts on succulent growth along roadsides, railroad right-of-ways, canal banks, and field margins, or to such crops as rank-growing alfalfa, young cotton, or corn.

Dosages and Formulations.—Chlordane and toxaphene applied as sprays give higher initial kills, and continue to kill over a longer period, than equal dosages of dusts. When using sprays, apply 1 pound of technical chlordane or 1½ pounds of technical toxaphene per

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1/ This supersedes EC-1, New Insecticides for Grasshopper Control.

acre. When using dusts, apply 1½ pounds of technical chlordane or 2 pounds of technical toxaphene per acre.

These dosages have given high initial kills and residual action lasting 1 to 3 weeks under a wide variety of conditions and are recommended to farmers for general use. Slightly lower dosages are effective against newly hatched grasshoppers, but if some eggs are still unhatched and long-continued killing action is desired the dosages recommended above should be used. A slight increase in the dosage of both sprays and dusts may be necessary late in the season, when most of the grasshoppers are adults and vegetation is maturing.

Chlordane and toxaphene are manufactured as emulsion concentrates, wettable powders, and dusts of various strengths of the technical material. Emulsion concentrates and wettable powders may be diluted with water to suit available spraying equipment. Whatever the formulation or dilution, the quantity of technical material applied per acre should conform to the stated recommendations.

Time and Methods of Application.—If these new insecticides are to be effective, they must be applied properly, at the right time, and in the right places. They may be applied with ground dusters or sprayers of various types, or from airplanes. However, the equipment used should be carefully adjusted so that the rate of application is accurately controlled. Too much material, besides being wasteful, increases the danger of residues; too little insecticide is also

wasteful of labor and materials because it will not prevent crop losses. The insecticide should be distributed evenly over the area needing treatment.

Farmers intending to use these new insecticides as sprays or dusts for grasshopper control should proceed as follows:

1. Observe proper precautions in handling and using them. Remember that, like most insecticides, they are poisonous to man and livestock.

2. Determine the location of dangerous infestations of young grasshoppers in relation to the fields planted to the crop. They may be found on roadsides, canal banks, field margins, or idle lands bordering cultivated fields, as well as in the fields themselves. Spray or dust these infestations when the main hatch is completed or when the young hoppers begin to move off the hatching grounds, and thus greatly reduce the acreage to be treated. Grasshoppers that damage row crops generally hatch in the field margins. Timely spraying or dusting will destroy them before they move into the fields.

3. Prevent grasshoppers from damaging corn by treating margins of cornfields and adjacent infested small-grain fields or weed patches when small grains begin to mature and before the hoppers move into the corn.

4. When an entire alfalfa field is infested with damaging populations of grasshoppers, it is ordinarily most economical to cut the alfalfa and then apply control measures to protect the

next cutting. The best procedure is to spray or dust field margins, ditch banks, patches of weeds, or uncut strips of alfalfa where grasshoppers have concentrated after the first crop is removed. Grasshoppers frequently hatch in considerable numbers after the first crop has been harvested and fields have been irrigated. To control these insects spray or dust the next crop when the vegetation is 6 to 10 inches high This practice avoids heavy residue at harvesttime and protects the new growth.

PRECAUTIONS.--DO NOT FEED FORAGE TREATED WITH THESE NEW INSECTICIDES TO DAIRY ANIMALS OR TO ANIMALS BEING FINISHED FOR SLAUGHTER. Some of these insecticides are known to accumulate in the fatty tissues of animals and are given off in milk and butterfat. Forage treated with them at dosages heavier than needed for grasshopper control has been fed to meat animals continuously for several weeks to the exclusion of all other feed, without visible impairment of their health or development. However, meat animals fed for long periods on treated forage may accumulate enough of these chemicals in their tissues to make the meat unfit for food. This possibility is greatly reduced if no treated vegetation is fed during the last two months before slaughter.

If these chemicals are used on fruits and vegetables, do not apply them to the parts of the plants that will be eaten or marketed unless residues can and will be removed by washing or stripping.

AVOID APPLYING THESE INSECTICIDES TO LEGUMES IN BLOOM. If control during this period is needed to save the seed crop, spray in the early morning or late evening while bees are inactive. Sprays are less harmful to bees than are dusts.

Baits

Grasshopper control has been improved by the use of the new organic insecticides in baits as well as in sprays and dusts. As sprays and dusts they have given better control of grasshoppers in dense succulent vegetation. Bait is much more economical, and equally effective, in sparse range grass, grain stubble, or dry vegetation which is no longer attractive to grasshoppers as food. In fall-seeded grain, when the plants are only a few inches tall, bait is not only more economical but much more effective.

Wet Baits.—Chlordane or toxaphene can be substituted for sodium fluosilicate in any wet-bait formula containing bran and sawdust. Both insecticides have been tested in the standard bran-sawdust bait for two seasons. Both kill more quickly and for a longer period than sodium fluosilicate. Chlordane at ½ pound and toxaphene at 1 pound have consistently given at least as good kill as 6 pounds of sodium fluosilicate per 100 pounds of dry bran and sawdust.

Emulsion concentrates and wettable powders are the most practical formulations for use in wet baits. They can be stirred into the quantity of water required for wet baits and applied to the

bran-sawdust mixture in a single mixing operation. They are obtainable at various strengths, but whatever their strength, they should be used to provide ½ pound of chlordane or 1 pound of toxaphene for each 100 pounds of the dry bran-sawdust mixture.

Dry Bait.--A dry bait consisting of coarse bran impregnated with an oil solution of chlordane or toxaphene has been used very successfully in controlling grasshoppers on range land. The dosage used, 5 pounds of dry bait per acre, is equivalent to 20 pounds of wet bait. This is an advantage, particularly when bait is applied by airplane, because the plane can operate four times as long without reloading. Dry bait can be prepared at the farmer's convenience and stored until needed.

Dry bait can be applied by airplane and single-outlet dusters, but should not be used in wet-bait broadcasting machines, as they are not equipped to apply such a small quantity uniformly.

Dry bait is made as follows:

Prepare an oil solution containing ½ pound of chlordane or 1 pound of toxaphene to each ½ gallon of solution. When using technical chlordane or an emulsion concentrate of toxaphene, add enough kerosene to the insecticide to make the required quantity of solution. When using technical toxaphene, which is a gummy, semisolid material, be sure to dissolve it completely in the kerosene. Apply the oil solution of either insecticide as a finely divided spray to the dry bran at the rate of ½ gallon to 100 pounds of coarse bran containing no flourlike material. Wet-bait mixing machines may be

equipped with spraying devices for this purpose. 2/

For mixing small quantities, spread the dry bran thinly and evenly on a concrete floor and apply the solution with a hand sprayer.

Turn the bran several times during the spraying operation. In mixing dry bait every effort should be made to obtain uniform distribution of the small quantity of solution throughout the dry bran.

Community Action Needed for Successful Control

Grasshopper control, regardless of the method used, is most effective when all property owners in a community cooperate in destroying threatening infestations of grasshoppers wherever they are found.

2/ Information regarding such equipment may be obtained from the Division of Grasshopper Control, Bureau of Entomology and Plant Quarantine, 131 Speer Blvd., Denver, Colo.