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TILLAGE METHODS
IN
GRASSHOPPER CONTROL

by

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TILLAGE METHODS IN GRASSHOPPER CONTROL
(A Progress Report)

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The eyes of the world are turned toward the American farmer as the individual to whom they must look for the production of a plentiful supply of food for our fighting forces, our Allies and for the hungry millions as they are liberated from Nazi rule and devastation. Grasshoppers have done much to defeat the Great Plains farmers in their effort to produce this food.

In the central part of our State many fields of corn, badly needed for feed, were planted during the past year from which not one bushel of grain was harvested. Numerous fields of flax, very important as an oil crop, remained uncut. Many fields of small grain, also badly needed for feed and the manufacture of food products, had the yield per acre very seriously reduced. This damage was done by grasshoppers and under moisture conditions which otherwise could have permitted a good harvest.

By the use of appropriate tillage methods, and using them at the proper time of the year, the damage which will otherwise be done by grasshoppers can be reduced considerably.

Based upon four years of experimentation the following tables give an evaluation of the effectiveness of various tillage implements for use in grasshopper control.

EXPERIMENTS IN THE WINNER-RELIANCE-CHAMBERLAIN AREA
Heavy soils ---- clay and clay loam
Fall Tillage under Field Conditions

<u>Tillage Treatment</u>	<u>Average Percentage Control</u>
Moldboard plowing	81.33
Single discing	76.34
Double discing	74.35
Narrow sweep sub-surface cultivation	59.93
Straight blade sub-surface cultivation	58.02
One-way discing (wheat land plow)	44.61
Listing (one test)	26.85 ¹
Cut-away disc treatment (one test)	20.70

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EXPERIMENTS IN THE HECLA AREA
Light soil ---- sand and sandy loam
Fall Tillage under Field Conditions

<u>Tillage Treatment</u>	<u>Average Percentage Control</u>
Listing* (one test)	100.00*
Tandem discing	97.40
Moldboard plowing	96.04
One-way discing plus drilling (one test)	93.97
One-way discing (wheat land plow)	92.27
Wide sweep sub-surface cultivation (one test)	91.49
Narrow sweep sub-surface cultivation	84.27
Plowing with moldboard removed	74.11
Double discing (one test)	60.07
Single discing	44.51
Straight blade sub-surface cultivation	2.90

*It is the writer's belief that additional experiments with listing will without doubt lower this figure. All the above figures are subject to change as subsequent tests and emergence results may justify.

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SUGGESTIONS FOR USE OF TILLAGE IN GRASSHOPPER CONTROL

1. Plan your control campaign in advance. The man who waits until the 'hoppers hatch has lost a major battle in grasshopper control, and with it a chance to reduce greatly the future damage to his crops.
2. Fall tillage is best but if no fall tillage was used then spring tillage can be used to advantage. Spring tillage should be done as early as possible with particular attention being given to outer edges (150 feet) of fields and to headlands. Both surface and sub-surface methods are good in that they disturb the soil for a depth of at least 2 - 3 inches.
3. In using the above tables as a guide in the choice of implement for 'hopper control one should note that the results differ with the different types of soil. Consult the table which most nearly matches the soil type of the land to be treated.
4. Consider soil erosion control recommendations as well as grasshopper control when choosing the implement to be used.
5. Deep plowing is recommended where it can be done without danger of soil blowing.
6. Cultivate with a spring tooth harrow early next spring to reduce hatching of grasshoppers in alfalfa fields.
7. (IMPORTANT) Use tillage following harvest to create unfavorable egg-laying conditions in fields. Leave untilled strips, 15 to 20 feet wide, every 15 or 20 rods in the field to function as egg concentration areas. These strips should be tillage treated when grasshopper egg-laying has been completed, late in the fall.
8. (IMPORTANT) Fields should be examined in the fall, if at all possible, to determine the amount of grasshopper egg deposition. Inexpensive egg screens can be constructed from 1 x 4 boards and 1/4 inch mesh hardware cloth. Soil samples of approximately one-half square foot each, of the surface 2-inch layer of soil, should be taken at intervals over the field and field margins. The screening of egg pods from these individual samples gives a good estimate of the seriousness of the infestation. An egg pod count of one per square foot in a field on an average (or one pod per 2 samples) is an indication of a threatening grasshopper infestation. This may mean, depending upon weather and other factors, from 35 to 45 percent damage to crops, by Government and State Extension Service figures. The infestation does not necessarily have to be this heavy to warrant the use of tillage as a control measure.
9. In headlands and edges of pastures bordering cultivated land, where tillage cannot be used, the TIMELY use of poisoned bait is recommended. Poisoning is most effective while the 'hoppers are small and before they scatter out from their hatching grounds. Consult your County Agent.