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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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INTRODUCTION:

In the light of the present world food situation, the control of insects assumes a role of major importance in the agricultural program.

Various insects, among which grasshoppers are one of the most notorious, attack our growing crops, upon which we depend for food. Others attack grains in storage; plant and animal products of many kinds; clothing and articles of furniture; and our domestic livestock. Man himself is not immune from attack, as is borne out by the epidemics of louse transmitted typhus which are today growing in extent in certain parts of Europe. The losses sustained by mankind due to the ravages of insects runs into a staggering figure every year.

This report, however, is concerned solely with the control of grasshoppers, which in South Dakota alone have destroyed millions of dollars worth of cereal, forage and truck crops in each of the past several years. Mr. G. I. Gilbertson, South Dakota Extension Entomologist, gives the loss figure of $42,303,030 for the 5-year period of 1937-1941, inclusive.

In times of war, when farmers are being urged to produce as much food as possible, one cannot afford not to give due consideration to any factor which serves to reduce the yield of food products from a given area of land. Grasshoppers are "fifth columnists" to the farmer just as much as the individual who bombs a factory is to the manufacturer. In the case of damage done by grasshoppers the results are merely spread out over more territory, do not show up so suddenly, and are therefore not so glaring.

There are several ways by which damage done by grasshoppers can be materially reduced and it is the patriotic duty of each farmer to see that the damage is reduced as much as possible. Cooperation is essential because grasshoppers from the land of one non-cooperator will spread to the land of cooperators all around him. However, this important fact remains: the damage may be lessened proportionately because the cooperators have reduced the grasshopper populations upon their own land.

Certain tillage practices employed by farmers, if done at the right time, comprise one of the most important means of reducing grasshopper populations. In the light of present knowledge these should be followed by the timely use of poison bait for the best results.

The South Dakota Station tillage project for grasshopper control was started in the fall of 1939. A progress report covering the first year's findings was issued in November 1940, as Entomology Pamphlet No. 1. This report is a follow-up of the above-mentioned report and contains the results for 1940 and, in addition, the results of the findings for 1941.

EXPERIMENTS IN THE WINNER-RELIANCE AREA: SOIL TYPE -- BOYD CLAY-LOAM

FALL TILLAGE

Tillage Method	Number of Tests	Average Percentage Control
Double Discing	1	100
Regular Listing	1	100
Moldboard Plowing	2	97.45
One-way Discing (wheat land plow)	2	88.53
Single Discing	4	86.59
Sub-surface cult. (A)* (duck-foot type)	1	72.50
Sub-surface cult. (B)* (duck-foot type)	3	53.00
Sub-surface cult. (straight blade type)	3	50.00
Cut-away disc discing	1	36.12

SPRING TILLAGE

Sub-surface cult. (B)* (duck-foot type)	1	89.78
Single discing	1	82.96
Regular listing	1	No control

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* Designated by A and B in lieu of commercial name which is not given.

EXPERIMENTS IN THE HECLA AREA: SOIL TYPE -- VALENTINE SAND

FALL TILLAGE

Tillage Method	Number of Tests	Average Percentage Control
Moldboard Plowing	2	96.82
Sub-surface cult. (B) (duck-foot type)	1	83.15
One-way discing (wheat land plow)	2	72.66
Double discing	1	71.35
One-way discing plus drilling of grain	1	67.53
Single discing	1	51.09
Double tandem discing	1	50.15
Sub-surface cult. (straight blade type)	1	3.95
Plowing with moldboard removed	2	No control

COMMENTS:

Surveys have been made for a continuation of these studies during the spring of 1942. Fall tillage treatments on experimental areas have been completed; spring treatments will be completed in March or April 1942. Upon the completion of observations which will subsequently be made, another progress report will be issued.

It is to be remembered that the figures given above are subject to change should subsequent observations warrant such change.

The choice of tillage methods employed by the farmer should be made only after consideration of at least the following:

1. Control of grasshoppers,
2. Conservation of soil,
3. Conservation of moisture,
4. Control of weeds, and
5. Seed bed preparation.

These experiments were conducted in the Soil Conservation Districts of Winner-Dixon, Chamberlain (Reliance area), and Hecla. The writer here expresses his appreciation for the cooperation given by the Soil Conservation Service, the officials in these districts and the officials in the Huron and Carpenter areas where preparations for experiments were completed during the fall of 1941.