

6-1918

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A. H. Sherwood

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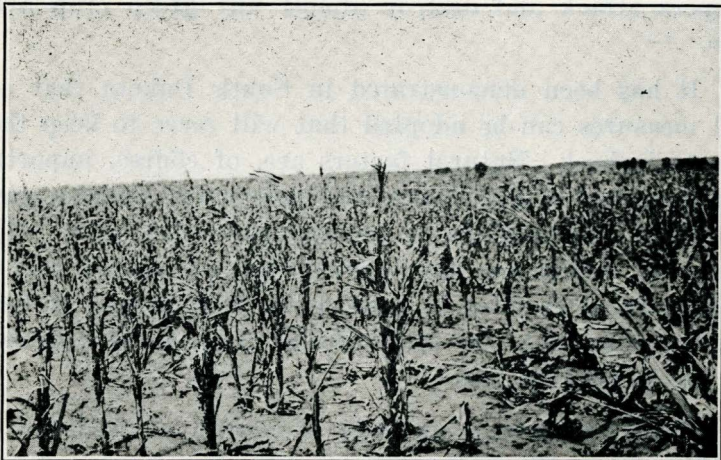
Recommended Citation

Sherwood, A. H., "Poisoned Bait as a Control for Grasshoppers" (1918). *Cooperative Extension Circulars: 1917-1950*. Paper 5.
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Poisoned Bait as a Control for Grasshoppers

A. H. SHERWOOD
Special Field Agent
Bureau of Entomology
U. S. D. A.



“Injury to Corn by Grasshoppers.” After Dean.

EXTENSION DIVISION
SOUTH DAKOTA STATE COLLEGE OF
AGRICULTURE AND MECHANIC ARTS

C. LARSON, *Director*

Cooperative Extension Work in Agriculture
and Home Economics, South Dakota State
College and U. S. Department of Agriculture
Cooperating.

Brookings

Introduction.

Grasshoppers have done considerable damage to South Dakota field crops the past few years. Last year reports from various parts of the state show severe injury to alfalfa, corn, small grains, gardens, and other crops. The injury usually centers around alfalfa fields but the grasshoppers attack and destroy almost any green crop available.

It has been demonstrated in South Dakota that control measures can be adopted that will serve to keep these insects in check. Natural factors are, of course, important in the control of any insect, and their many enemies greatly reduce the numbers of grasshoppers each year. However, our experience has proven that we cannot rely on these natural enemies to protect us from injury, it being necessary to add our own efforts to those of nature if we are to prevent loss.

There are several methods of control advised for use in this state. These may all be classed under two heads; first, those that destroy the eggs, and second, those that destroy the young and adult grasshoppers. Plowing, disking, harrowing, and renovating effect the destruction of numbers of eggs. When an outbreak occurs remedial measures must be used to reduce the numbers of insects, and the best ones for this state are poisoned bait, the hopper catcher, spraying, and the use of poultry and hogs. The object of this circular is to give directions for the use of poisoned bait to destroy the young and adult grasshoppers.

Poisoned Bait As a Control for Grasshoppers.



"Sowing Poisoned Bran Bait Broadcast in Treating Grasshopper Infested Fields." 1915 Y. B. Dept. Agr.

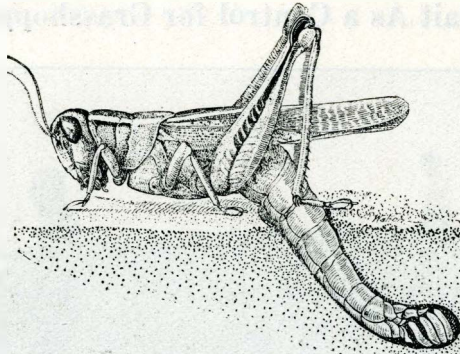
Poisoned bait has proven to be an economical and dependable control for grasshoppers in South Dakota. This bait is not a new idea, but, in various formulae, has been used in several western states the past few years. The formula given below is that recommended by Professor H. C. Severin, state entomologist, after trials in this state the past few years. When made and applied according to directions poisoned bait offers a practical means of protection for field crops. It is urged that wherever it is used it be mixed according to directions, and that it be carefully applied. The best results can be expected only when this is done.

Formula for Poisoned Bait.

Wheat bran, coarse flaked.....	25 pounds
Arsenic or paris green.....	1 pound
Low grade or black strap molasses.....	2 quarts
Lemons or oranges.....	6 fruits
Water	4 gallons

Mixing the Bait.

Mix the dry bran and arsenic thoroughly with a hoe or a stick. Poisoning may result from arsenic coming in



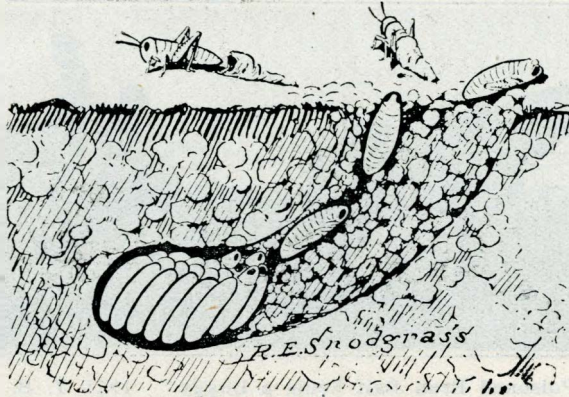
“Female Laying Eggs.” After Howard.

contact with the back of the hands and arms, and for this reason the bare hands should not come in contact with it more than necessary. The mixing may be done in a box or on a feed floor, out of a strong draft of wind. Care should be taken to avoid breathing the poison. A moist sponge tied over the nose will protect against this.

Dilute the molasses with 3 gallons of water. Grind the lemons or oranges in a food chopper and add to the diluted molasses.

Pour the mixture over the poisoned bran and mix thoroughly, being careful to moisten all the bran. More water may then be added so as to make the bait as moist as possible without having it become sloppy. The bait should be mixed just before using if possible, and should never stand over twelve hours.

Alfalfa meal or shorts may be substituted for bran with about equal success. The alfalfa should not be ground too fine for then it will scatter altogether too much when applied to the field. It requires more water than does bran, and, as it sours readily it should be mixed just before using. It is important that a low grade, rank smelling, molasses be used, in fact black strap should be obtained if at all possible. Last year many farmers used rhubarb cooked into a syrup in place of the lemons and they report very good results.



"Nymphs Hatching From Egg Mass." After Snodgrass.

Applying the Bait.

The poison bait may be spread on the field broadcast by hand or with the broadcast seeder. There is little danger of poisoning the hands with the wet bait if there are no open sores or cuts. A man carrying a pail of bait on his arm can spread it over a considerable distance on each side. Another method employed is to haul the bait in pails or tubs in the back end of a wagon and throw it out by hand. A broadcast seeder may be used successfully if the bait is not too wet. The amount of bait to use depends upon the severity of the outbreak and varies from five to seven pounds an acre. Do not spread the bait too thickly and never dump it in piles.

The above formula is sufficient for eight to ten acres. In order to get an idea of how thickly to spread it, one may weigh out enough pounds for an acre and apply it. Then the entire field may be baited at the same rate. If spread thinly, there will be little danger of poisoning birds and poultry, in fact in many instances poultry have been turned into the baited fields to catch the grasshoppers with no loss of the poultry.

The best time to put out the bait is in the late afternoon on a sunny day. The grasshoppers usually spend the hot hours of the day on the ground in the shade of



“Sowing Poisoned Bran Bait From a Buggy.” 1915 Y. B. Dept. Agr.

the vegetation, coming out to feed in the late afternoon and climbing up to roost on plants, fence posts, trees, etc., at night.

They remain at roost until it warms up in the morning and then they come down to feed. If the bait is applied in the late afternoon, the hoppers will feed on it that evening and again in the morning. As it dries out, it loses its attractiveness. On cloudy days the bait may be spread in the late afternoon, if there is no danger of a shower or rain. Rain greatly reduces its effectiveness and for this reason it should not be put out when a rain is threatening.

The results of using the bait are often not apparent for from three to four days as arsenic is a slow acting poison. In cases of severe infestation fields should be re-baited after two or three days.

Control in Grain Fields.

As soon as grasshoppers are discovered damaging a portion of a field that portion should be baited; by so doing the remainder of the field may be saved. If they are working over an entire field, the whole field must be baited.

In corn fields a slightly different formula is recommended, in which two or three times the amount of

molasses and less water in proportion are used. This bait can be thrown against the leaves and stalks of the corn to which much of it will adhere. Poisoned bait has been used very successfully in grain and corn fields.

In Alfalfa.

Alfalfa fields may be treated the same as grain fields. As alfalfa offers abundant green food for the insects, it is very important that the poison bait be as attractive as possible. In case the alfalfa is ready to be mowed a very good plan is to leave several strips uncut, each strip being a few yards wide. The hoppers will collect in these rows a day or so later and may then be baited. Whenever possible, some such plan should be used as it will reduce the cost and labor of applying the bait, and yet give very satisfactory results.

Gardens, Beets, Potatoes, Etc.

The bait is spread over these fields in the usual way. Small fields may, of course, be given more intensive treatment.

When Insects Are Migrating.

When grasshoppers are entering a field from a nearby one the bait should be applied to a strip along the edge of the field. Applications may be made every few days as long as the migrating continues. In the case of an alfalfa field, a strip may be left uncut along the edge and the bait applied there.

Take Steps in Time.

It is obvious that best results can be obtained only when a farmer is on the lookout for the trouble and is prepared to combat it. In the young stages the grasshoppers are so small as to attract little attention and for this reason farmers often report that no hoppers were noticed until after the first cutting of alfalfa. Only when they are endangering the fields is a hurry call for help sent in. Eleventh-hour methods of control are not as easily carried out, or as effective as those taken in ample time. The

best time to poison grasshoppers is before they reach maturity; for this reason farmers should watch their fields for the appearance of the insects, and be ready to apply the bait before they are full grown.

Unless arranged for ahead of time it is seldom possible to obtain poison and molasses of the right grade and at a reasonable price. The extension office will be glad to refer county agents and others to companies that can furnish these materials. It is suggested that all materials be handled through local dealers, wherever these are willing to handle them at a reasonable profit.

Work Required to Kill Hoppers.

There is no easy way to destroy grasshoppers. Poisoned bait is a remedial measure; that is, it is a means of reducing their numbers and damage when an outbreak occurs. Through the killing off of females before they lay their eggs, the numbers of hoppers which may hatch out the following year is reduced.

While other methods may be adopted for control, poisoned bait is the best remedy. The individual case should be studied carefully and control attempted in time.

Community Control.

Grasshopper outbreaks in this state are in most cases of a local or community nature. The insects which have done the chief damage during the past three years are of a non-migratory species, and while they have wings, they migrate but short distance from field to field or from farm to farm in search of food. From this it will be seen that the control of grasshoppers is a local problem and a neighborhood can control them within its own borders. It is often the case that one farmer may find his fields damaged by grasshoppers that have hatched out and migrated from a neighboring farm or right-of-way. It is discouraging for this farmer to attempt to control the insects unless there is co-operation on the part of the neighbors. It is urged that, wherever possible, control measures be taken up as a community problem.