CHINCH-BUG BARRIERS

By W. P. Flint

Cross-section of a chinch-bug barrier. Note line of repellent material on the ridge and the post holes in the bottom of the furrow.
FIG. 1.—CORNFIELD INVADEN BY CHINCH-BUGS AT HARVEST TIME
More than thirty acres of corn were killed in this field of forty acres.
CHINCH-BUG BARRIERS!

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The use of barriers around wheat fields at harvest time is one of the best means of killing the first brood of chinch-bugs. By this means the first brood may be entirely kept out of the corn and tens of millions of the bugs killed. If the weather is unfavorable to the development of the second brood of bugs, or if the general infestation in the neighborhood is not excessively heavy, most of the protected corn can be saved. Even in the heaviest infestations, corn that has been protected can, if cut early, be utilized for silage. If every field of small grain in a chinch-bug infested area could be entirely surrounded by a barrier at harvest time it might be possible to stop nearly all damage from these insects. In actual field practice it has never been found possible to do this, but thousands of acres of corn have been saved by the use of barriers.

If corn has been planted in proximity to a field of small grain infested with chinch-bugs, it is folly to allow the first brood to destroy the corn following the harvesting of the small grain. The corn has at this time generally reached a height of eight to fourteen inches, and if the bugs are allowed to take it, the labor of raising the corn to this stage, the use of the land for the season, and the seed are all lost. There is always the possibility that the second brood will be reduced in numbers by unfavorable weather conditions, and hence do little damage if barriers are used, even when the first brood has been abundant. For this reason, where it is possible, barriers should always be used to prevent the direct invasion of the cornfields. Chinch-bug resistant varieties of corn which are protected by barriers will always make at least a partial crop.

CREOSOTE BARRIER

One of the best barriers thus far developed is the creosote barrier. This is made by throwing up a ridge of earth around the infested field of small grain, and pouring along the brow of this ridge a small stream of creosote. At the bottom of the ridge, on the side toward the small grain, a row of post holes 18 to 24 inches deep are dug from 20 to 50 feet apart. The tops of these holes should be flared and kept

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dusty. If kept in this way, the bugs, on following along the line of the barrier and arriving at the hole, cannot get a foothold, fall in, and are unable to climb out. A line of creosote painted around the inside of the hole about four inches from the top will help in keeping in the bugs.

The creosote is applied by putting it in a galvanized or tin bucket, in which a small hole has been punched in the side, near the bottom, with a six-penny nail, and walking along the barrier, directing the stream of liquid against the brow of the ridge on the side toward the field of small grain, so that the bugs will always have to crawl up to it. The creosote must be renewed once a day during the first week and should always be applied on the same line. The application should generally be made about one o'clock in the afternoon, before the bugs are massed against the line. It is the odor of the creosote that prevents them from crossing this barrier, and if the line is renewed when they are massed against it, many become confused by the strong smell of creosote in the air, and run over the line. It will require, on the average, a barrel of creosote for each half-mile of barrier maintained for the entire period during which the bugs are leaving the wheat stubble.
The creosote should preferably be of a grade with a high naphthalene content.¹

In making a creosote barrier, a line of limestone is sometimes spread along the brow of the ridge and the creosote applied on this material. Limestone retains the odor of creosote better than does the soil and thus its use makes the barrier somewhat more effective than if the creosote is applied directly to the soil.

![Figure 3: Barrier in Use Before Harvest](image)

Sometimes the bugs dry up the small grain and leave before it is cut.

**COAL TAR BARRIER**

Coal tar may be used as a barrier in much the same manner as creosote, but the ground on which it is poured should be nearly level and compacted as firmly as possible, and a larger quantity of coal tar will have to be applied than is used of creosote. A row of post holes should be dug in the same way as described for the creosote barrier.

It must be borne in mind that the effectiveness of the coal-tar barrier depends largely on the sticky character of the material. It will have to be renewed more frequently than the creosote, and as about

¹Creosote for this work may be obtained from the F. J. Lewis Manufacturing Company, Moline, Illinois; from the Barrett Company, St. Louis or Chicago, or their agents; from the Republic Creosoting Company, Indianapolis, Indiana, or from nearly any large dealer in coal-tar products.
twice as much coal tar is required as creosote, the cost of maintaining this kind of a barrier is usually higher than the cost of maintaining one of creosote.

Coal tar for this work may be obtained from gas plants in any of the larger cities. There is a wide difference in the grade of this material obtained from different gas plants. That which contains practically all the creosote is much more effective for barriers than that from which a part of the creosote compounds have been distilled.

**KEROSENE AND LIMESTONE BARRIER**

A barrier that is effective in stopping the bugs may be made by smoothing a path around the field of small grain and on this path placing a narrow ridge of ground agricultural limestone, which is later moistened with kerosene. The kerosene will prove more expensive than creosote, but the materials for making this barrier are always easily obtained. The kerosene should be applied by using a bucket in the same way as described for applying creosote. If the kerosene is applied to the bare ground the odor disappears too quickly to be effective. Applied to the limestone, the kerosene will have to be renewed two or three times each day.

For catching the bugs a row of post holes should be dug along the side of the barrier toward which the bugs are coming, as described under the creosote barrier.

**DUST BARRIER**

The oldest kind of barrier in use against the chinch-bug is the dust barrier, which is made by dragging a log or a trough of planks back and forth around the edge of the field of small grain, until a very dusty furrow is formed, out of which the bugs cannot climb. Another method of making a dust barrier is by repeatedly disk several strips between the small grain and the corn. On certain soils in dry weather a good dust barrier may be made by either of these methods, but constant labor is required to maintain it. If this form of barrier is used, materials for one of the above-mentioned barriers should always be at hand in case rain makes the dusty furrow passable to the bugs. The post holes cannot be used with this type of barrier.

**CARING FOR BARRIERS**

It will generally be necessary to maintain a barrier for eighteen to twenty-one days from the time the bugs start to leave the small grain. After a barrier is once made it will require the work of one man during the afternoons for each mile in order to keep it effective. During the forenoons the bugs are not very active, except on cloudy days. Usually very little attention, therefore, need be given to the barrier before midday.
The bugs in the holes should be killed each evening. This may be done by pouring a mixture of kerosene and water into the holes or by tamping. The effectiveness of the post holes is shown by the fact that seven to ten bushels of bugs have been caught in one week along a half-mile of barrier.

Bugs may also be killed along the barriers by flaming them with a large blowtorch, or a plumber's torch attached to a broom handle. This torch is hardly large enough, however, for effective work. The best type of torches for this work are such as are used for melting asphalt on the streets.

**SPRAYING CHINCH-BUGS**

If a cornfield has not been protected by means of a barrier and the bugs have massed on the first rows of corn, it is sometimes possible to kill them by spraying with a contact poison. A strong tobacco solution containing 40 percent of nicotine sulfate, for example, "Black Leaf 40," may be used at the rate of 1 tablespoonful to a gallon of water in which an ounce of laundry soap has been dissolved. Kerosene emulsion in a 10-percent dilution will serve the same purpose, but it is very likely to injure the corn.

To make this emulsion, dissolve \( \frac{1}{2} \) pound of laundry soap in 1 gallon of hot soft water and add 2 gallons of kerosene. Churn the water and oil together thoroly for at least ten minutes, either by pumping the mixture forcibly back into itself or by vigorously stirring it with a bundle of twigs or with a broom. When finished the emulsion should have the appearance and consistency of thick cream; it can then be kept for some weeks if put into closed containers. This is the stock emulsion. For a 10-percent mixture, use 3 parts of this stock emulsion to 17 parts of water. For a 5-percent mixture, use 3 parts to 37 parts of water.

With any of these sprays it is necessary to hit the bugs in order to kill them, for they obtain their food, not by eating the leaves of the plant, but by sucking its juices; therefore spraying the surface of the plant will not affect them.

**OTHER MEANS OF PROTECTION**

It should be kept in mind always that the chinch-bug feeds only on crops belonging to the grass family. Such crops as corn, sorghum, and broomcorn, therefore, can be afforded some protection by being grown as far as possible from infested fields of small grain, with intervening fields of soybeans, clover, alfalfa, or other crops which are not attacked by the bugs. Narrow strips of soybeans, cowpeas, or clover a rod or two in width will afford no protection to corn. These crops
are not sufficiently high to shade the ground at the time the small grain is harvested and the bugs will go through them about as readily as they will cross bare ground.

For information with regard to the various means of control of the chinch-bug, the reader is referred to the following publications which are issued by this Station:

- **Bulletin 243**: Varieties of Corn for Chinch-Bug Infested Areas
- **Circular 265**: Burn the Chinch-Bug
- **Circular 268**: Fight the Chinch-Bug with Crops
- **Extension Circular 39**: Crop Rotations to Starve the Chinch-Bugs

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