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The Chinch-Bug

"Few insects, and certainly no other species of the natural order to which this one belongs, have caused such enormous pecuniary losses as the chinch-bug. No other insect native to the Western Hemisphere has spread its devastating hordes over a wider area of country with more fatal effects to the staple grains of North America than has this one. But for the extreme susceptibility of the very young to destruction by drenching rains and to the less though not insignificant destructiveness during rainy seasons of "parasitic fungi" on both adults and young, the practice of raising grain year after year in the same areas, as followed in the United States, would become altogether unprofitable."* During the last forty years it is probable that the chinch-bug has effected more damage to staple crops in Kansas than can be charged to any other one insect.

This insect passes the winter as an adult bug in bunches of native grasses, under leaves in woodlands and hedgerows, under the leaf sheaths of corn-stalks, and under or in rubbish generally wherever it can find shelter. With the coming of favorable spring weather the chinch-bug emerges from winter quarters and flies away over wheat, barley and rye fields and grass lands. Here it settles to the ground and thrusting its beak into the growing plants feeds upon the flowing sap (after its long winter fast). Soon the female begins to deposit eggs upon the soil, in cracks and crevices of the soil, and upon the bases and roots of the plants. It is said that a female may lay 500 eggs in a period of from ten days to two weeks. The eggs are oval, about 3/100 of an inch long, pure white when laid, but changing to reddish as the hatching time approaches. In about two weeks from the date of laying, the eggs hatch and the orange-yellow young crawl actively about, soon thrusting their tiny beaks into the tender parts of the plants, and

*Bul. No. 69, U. S. Dept. Agric., Bureau of Entomology.

feeding on the sap. Soon after the eggs begin hatching, adults, white eggs, reddish eggs, and orange-yellow young may be found together in infested fields. On the failure of food through ripening of the grain, the bugs of all ages set out on foot to find succulent plants suited to their taste, generally moving toward the adjacent corn fields. In the corn field they lay eggs for the generation that, reaching maturity before cold weather, passes the winter as already described. The chinch-bug requires, under normal out-door conditions, from 57 to 60 days to pass from freshly laid eggs to adults and produces two generations each year.

Owing to favorable or unfavorable weather conditions and to the absence or presence of natural enemies, the chinch-bug is sometimes present in devastating hordes and sometimes so rare as to do no appreciable damage. The period of abundant chinch-bugs is always followed by a time when they are comparatively rare, and that in its turn by another period of abundance.

Last fall the great abundance of bugs and the serious nature of the damage reported indicated that a period of chinch-bug trouble was at hand, and the reported injury to wheat and barley this spring has only served to strengthen the impression. The heavy rains occurring just at the hatching time have, however, destroyed many of the young, and if continued throughout the hatching period may do much to prevent later trouble. Parasitic fungi, thriving as they are under the unusual moisture and attacking both adults and young, are working toward the same end. Last fall not less than 25 counties lying mainly within the eastern part of the wheat belt reported chinch-bug in serious numbers, and this spring at least twelve have reported the chinch-bugs injuring the wheat. It is, therefore, probable that, unless the damp, rainy weather continues throughout the hatching season and parasitic fungi take hold generally, the young bugs will, with the hardening of infested wheat and other grains, march into adjoining corn fields and do great harm. Unfortunately, the present knowledge of chinch-bug warfare shows there is no practicable method of destroying the bugs in the wheat save as nature herself, through the agency of dashing rains, destroys the hatching young and encourages the growth of parasitic fungi on young and old.

There is, then, danger that in many localities the chinch-bugs will march from ripening wheat into near-by corn fields, and the question is how to prevent this disaster. Fortunately, many experiments have been performed along this line and an abundance of data made available.

When the bugs set out in search of food the farmer can prevent them from passing into his growing corn or other grain by erect-

ing and maintaining barriers between the field from which they come and the field toward which they are going. In general, there are two types of barriers—one, the dust line, especially useful in dry weather, and the other the petroleum or tar line, especially fitted for wet weather. The best type of dust barrier may be constructed as follows: Plow a strip 6 to 10 feet wide between the infested field and the field to be protected; thoroughly and deeply pulverize the strip with a disk harrow; then reduce the surface to dust by dragging a brush or other instrument over it; drag a short log eight or ten inches in diameter, or a triangular trough, made by nailing two boards together and loading with stone, lengthwise along the dusty strip as near as practicable to the infested side until a deep furrow has been made; dress up the sides with a hoe so that no passageways may be left; dig post-holes at least twelve inches deep in the bottom of this furrow at intervals of twenty feet. The bugs will collect in these holes, where they may be destroyed by pouring kerosene upon them. After a time the slope of the furrow-wall will be lessened by the dragging down of the dust particles under the many persistent feet, and a new furrow should be constructed in the same way, parallel to the old. This procedure should be continued as long as the bugs keep coming.

This dust barrier will work perfectly so long as the ground can be kept thoroughly dusty, but its usefulness is destroyed by even a slight rain, which hardens the surface and allows the chinch-bugs to pass over without difficulty.

The petroleum or coal-tar barrier may be constructed as follows: Prepare a hard, smooth surface in any one of three ways — (1) by dragging a heavily loaded plank over a strip between the infested field and the one to be protected; (2) by plowing a back furrow and shaping it into a smooth-walled ridge with a furrow along its summit by running over it an inverted convex-bottomed trough of proper size; (3) by plowing a furrow and cleaning out the soft dirt; pour along the smooth surface so constructed a line of coal tar or crude petroleum about three-fourths of an inch wide, and keep this fresh so that the bugs can find no place to cross; dig post-holes at intervals of twenty feet along the infested side of the line. The bugs will not cross the line, but will collect in the holes, where they may be destroyed by pouring kerosene oil upon them. A man or boy can guard 80 to 100 rods of such a barrier, but he must be in the field early and late.

In regions where irrigation is possible, land sufficiently level, and soil of such a character that the water will remain in the ditches, an efficient barrier may be made by plowing a furrow be-

tween the infested field and the one to be protected, and keeping it filled with water over which a surface film of kerosene oil has been spread.

It is not enough to know that these barriers are effective and how they are made. The farmers must know also when they should be constructed. This he can know with certainty only by careful observation of the chinch-bugs. If the wheat be free from grass and weeds, the bugs are likely to leave as soon as it hardens, but if it be full of grass and weeds, their going may be long delayed. If he finds the bugs very abundant, all preparations necessary to the construction of barriers should be completed. Then by keeping a careful watch he can tell when the insects are beginning to move and should lose no time in preparing the barriers. From this time forward he must attend to the barriers until the bugs cease to come. Should they get into the first few rows before they are noticed, the petroleum or tar-line barrier should be run between the infested and non-infested parts of the corn field and their further passage vigorously disputed.

By careful attention and the expenditure of a reasonable amount of time and labor in view of the object to be gained, the enterprising farmer can prevent the damage which would otherwise be felt in his decreased corn crop. Let those whose corn fields lie adjacent to bug-infested wheat fields be on their guard.

The chinch-bug may be attacked to advantage in its winter quarters, but that phase of the question will be treated at another time.

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