

# Kansas State Agricultural College.

## EXPERIMENT STATION.—Circular No. 5.

DEPARTMENT OF ENTOMOLOGY.

T. J. HEADLEE, Entomologist and Zoölogist in Charge.

### Chinch Bug.

BY

J. B. PARKER,

*Assistant in Entomological Investigation.*

#### INFESTATION AND DAMAGE.

Last season the chinch bug did a large amount of damage in parts of Kansas. A glance at the map will show that the area of infestation covers a large part of the corn belt of the state. The Nebraska line on the north, the Oklahoma line on the south, a line joining Phillips and Harper counties on the west and another joining Republic and Crawford counties on the east, roughly bound the infested district. Our correspondents in the counties within this territory, in reporting the damage to corn by chinch bugs, variously estimate the loss at from five to fifty per cent of the crop. The damage is reported

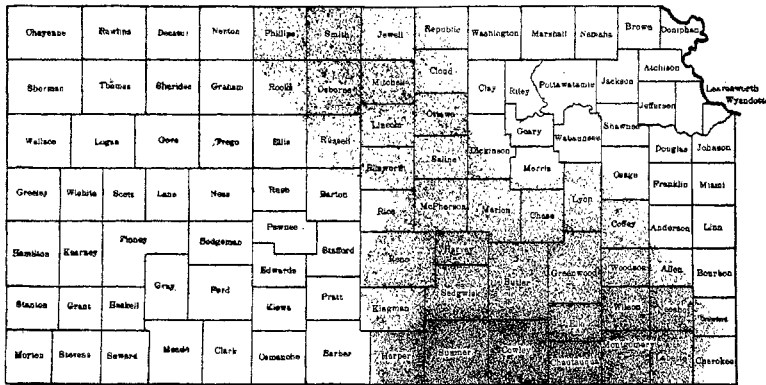


FIG. 1. Map showing approximately the area over which the corn crop of 1909 suffered from chinch bugs a damage of five per cent or greater. The darker shading indicates the area of heavier damage.

lightest in the central part of the infested area, somewhat heavier in the northern part, and heaviest in the southern section, particularly in Sumner county, where the estimates of injury to corn vary from twenty to eighty-five per cent of the crop. Much difficulty is experienced in arriving at a satisfactory estimate of the damage caused by the bugs, owing to its close association with the injury the corn sustained from lack of moisture during the severe drought of late summer. To our mind, where bugs were abundant, of the total damage, sustained by the corn that part which was due to the direct effect of the dry weather was of less importance than that which the prolonged drought enabled the bugs to do. The injurious effect of their work was increased by weather conditions that favored the bugs and at the same time deprived the corn of its powers of resistance to their attack. Consequently much of the damage attributed to the effects of the dry weather may in many cases justly be accredited to the work of the chinch bugs.

#### DANGER.

We are at this time, however, far less concerned with what damage the dry weather occasioned than we are with the fact that it provided the bugs with ideal conditions under which to thrive and multiply. That they made the most of their opportunity is amply shown by the numbers that developed in the cornfields. When we remember that practically all these bugs passed safely from the ripened corn into winter quarters, where they await the coming of spring to begin their attack upon the wheat, we can readily understand the danger that threatens the cereal crops of 1910. If between now and the advent of warm weather next spring these bugs are not destroyed, either by natural agencies or by the farmers themselves, we may expect to see the wheat fields next May overrun by the same horde of bugs that developed in the corn last summer.

#### WHERE THE BUGS ARE NOW.

As is well known, when the cold weather of autumn comes on the chinch bugs abandon their feeding grounds and betake themselves to flight in search of winter quarters, in which they remain in hibernation until the following spring. The current belief, however, that the majority of the bugs pass

the winter among cornstalks, in hedgerows, straw stacks and heaps of rubbish about the farms is not borne out by our investigations. When the bugs are abundant, as they are in Sumner county, a few may be found in any of the situations named above—in fact we have found no place covered with vegetation wholly free from them—but the threatening mass of bugs is to be found in *clumps of bunch-grass and among bluestem* in pastures and mown meadows, along roadsides of highways and railroads and in neglected corners of cultivated fields. We have found but few bugs hibernating in fields covered with crab grass or foxtail, and not many wintering in the cornfields or in hedgerows that are devoid of native clump-forming grasses. In the meadows from which the native prairie hay has been mown great numbers of the bugs may be found tucked away about the roots of the grass or hiding behind the leaf sheaths of the stubble of bluestem. But the places most preferred, the ones that harbor the great majority of the bugs, are the clumps of bunch-grass. A single clump of this grass eight inches in diameter growing on a roadside bordered by a cornfield was found to contain twenty thousand chinch bugs.

#### HOW TO ATTACK THEM.

The situation of the hibernating bugs offers the farmer an excellent opportunity to attack them. To do this it will be necessary to run fire over all pastures, meadows, roadsides and neglected places where native grasses abound. Since the chinch bugs fly from their winter quarters into the wheat in the spring, this attack, if it is to be of the greatest efficiency, must be made by all the farmers or landowners over a continuous and extended area. Our experiments in burning this fall, made prior to the 15th of November, showed that the stems of bunch-grass and bluestem were, up to that date, too green and full of sap to burn down close to the ground. As a result, although countless numbers of the bugs were destroyed in each trial, entirely too many escaped uninjured to warrant a general burning at that time. It is, however, our conviction that even when burning is done under the most favorable conditions, a small percentage of the bugs—those that have worked their way down to the roots of the bunch-grass—will escape the fire. The best time, therefore, to make this general

burning would be just before winter sets in, in order that those bugs escaping the fire might be forced to pass the winter without protection. Unfortunately the heavy rains of November and the early advent of winter have rendered that procedure impossible this year. Consequently the burning should be made just as soon as the grass in which the bugs are hibernating becomes dry enough to burn down close to the ground. The attack on the bug should not be delayed until spring, unless conditions should render it impossible to make it during the winter. The number of bugs hibernating in the cornfields does not seem to us sufficient to warrant the burning of the stalks. We urge that stalks and other litter in these fields be plowed under in the fall or early winter.

DON'T DEPEND ON NATURAL AGENCIES.

It is generally accepted that a rainy season is detrimental to chinch bugs, and it is possible that a fortunate combination of climatic conditions may destroy them in their winter quarters, or that, even if they do pass the winter successfully and escape to the wheat fields, weather conditions in the spring may, through the agency of disease, destroy them or their progeny and thus prevent a serious outbreak. But the conditions that govern natural agencies inimical to the chinch bug are wholly beyond our control. To rely upon such contingencies for relief is to place dependence upon chance; and to trust to chance to rid us of a pest so dangerous as the chinch bugs threaten to become next year, when it is possible to destroy them in their winter quarters, seems to us to be extreme folly.

FUNGUS NOT ALWAYS EFFECTIVE.

Another matter that calls for consideration is the widespread and erroneous belief that if the chinch bugs become dangerous next year they can, regardless of weather conditions, be controlled by the introduction of a fungous disease among them. Our investigations show that this fungus (*Sporotrichum globuliferum*), though present among the bugs, will not always control them. In June of this year wheat fields in Harvey and Sumner counties were examined, and wherever chinch bugs were found there also the fungus was present. During July the Station had an agent in the field in Sumner county collecting chinch bugs that had died of this fungous disease. When, on October 1, we resumed our study

of the chinch bug in the field in this same county, we found scattered over the fields of corn and Kafir corn bugs dead and whitened with this "chinch bug fungus." In many places even as late as November 15, in their winter quarters in the same county, bugs in small numbers were dying of this disease. Here, then, is a case in which the bugs were more abundant and did more damage than in any other section of the state in spite of the fact that the disease was present among them continually throughout the season. If weather conditions had been favorable to the development of the disease it would doubtless have controlled the pest, but as matters went it did not do so, and no amount of artificial introduction of the fungus in this instance could have brought relief from the ravages of these insects. During October and November we made repeated attempts to introduce the disease artificially among the bugs massed together in clumps of bunch-grass by placing in their midst bugs whitened with the spores of the fungus. But in every instance we secured only negative results, while on other areas of the same field where the grass had fallen down in a tangled mat, the bugs hiding beneath it, on or near the ground, were dying of the disease. We therefore are of the opinion that if conditions are not conducive to the development of this fungus its artificial introduction among the bugs will result in failure, and that if conditions are suitable to its development the disease will spring up of its own accord. In fact, we have never during the past two years examined a field in which chinch bugs were at work in large numbers without finding traces of this disease among them. Whether artificial introduction of the fungus among the bugs will under favorable conditions materially hasten its action is a problem that calls for fundamental investigation.

#### SUMMARY.

1. The chinch bugs are hibernating in bunch-grass, blue-stem and other native grasses in pastures, mown meadows, neglected places about the farm or along roadsides of highways and railroads.
2. If they are not destroyed by natural agencies or by the farmers they will prove disastrous to cereal crops next season.
3. It is not the part of wisdom to depend upon the "chinch bug fungus" to control the bugs.

4. Cornstalks, instead of being burned, should be plowed under in the fall or early winter.

5. As soon as the grass becomes thoroughly dry fire should be run over all pastures, meadows, roadsides and waste lands wherever bluestem, bunch-grass or other native clump-forming grasses are found.

Approved:  
**Ed. H. WEBSTER, Director.**  
MANHATTAN, KAN, December 16, 1909.

*[Faint, illegible text, likely bleed-through from the reverse side of the page]*