

Kansas State Agricultural College.

EXPERIMENT STATION.—Circular No. 16.

DEPARTMENT OF ENTOMOLOGY AND ZOOLOGY.

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

Burning Chinch Bugs.

By T. J. HEADLEE.

Burning Chinch Bugs.

WHERE THEY ARE AND THE DANGER.

Again the chinch bugs have established winter quarters in clump-forming grasses. They may be found more or less under all sorts of cover, but the threatening bulk of them has gathered in the bunch-grass. Those parts of the state greatly troubled with chinch bugs have much of this grass, and the problem of chinch-bug destruction during the dormant season involves the destruction of it and other grasses of similar habit. Of the clump-forming grasses, the species commonly known as "bunch-grass" (*Andropogon scoparius*) is most sought after by the bugs. The stems, standing upright and close together, form a dense upstanding shelter, protecting the bugs from rigors of winter. Indeed, effects of the chinch-bug fungus disease are rarely seen in infested clumps, nor have we ever known the disease to spread in such places, although we have many times distributed bugs dead and covered with the spores through the clumps infested by large numbers of healthy bugs. At the same time we have found the bugs dead and dying of the disease under cover which compelled them to lie close to the moist soil.

That the bugs have gathered this year in dangerous numbers is shown by careful counts made at Conway Springs and at Hays. Five clumps of bunch-grass taken at the former place gave an average of 1000 bugs each, and eight clumps examined at the latter place showed 400 apiece.



Bunch grass, the winter home of the chinch bug. Burn it.

When we consider the immense number of clumps of bunch-grass to be found in pastures, along roadsides and fences, and in waste places generally, it is easy to comprehend how threatening the situation looks. Certainly, if all the bugs now in winter quarters get through the winter safely and experience a dry and favorable spring and summer, Kansas crops will suffer a loss of many millions of dollars.

HOW TO FIND THE BUGS.

The farmer must know for himself whether he has bugs in his grass lands. This he can determine by parting the stems close to the place from which they start. Ordinarily a mulch of soil and decayed grass will have gathered at the base of the stems. He should look carefully in this and should not give up the search at once, because the bugs play possum and are not easily seen until they move. If the bugs are abundant they will be revealed by this search. In case more careful

6



FIG. 1. In this way you can find the bugs if they are abundant.



FIG. 2. In this way you find them if they are present in numbers to bother with.

looking is required to find them, take up a clump of the bunch-grass, root and all, and pick it to pieces over a large sheet of white paper or cloth, watching for the bugs. If they are present in any numbers worth considering, this should reveal them.

WHAT TO DO WITH THEM.

Having found that the bugs are present in considerable or large numbers, the next step is to determine where on the farm these clump-forming grasses are to be found. Then a practicable method of destroying the bug-infested clumps, which will at the same time destroy the bugs, must be selected. Fire



FIG. 3. What should be done with bug infested grasses, in waste places, along roadsides and fences, in pasture and mown meadows of native grass.

at once occurs to one as the most practical and efficient agent to be employed for this purpose. Obviously fire must destroy the bugs in one or both of two ways: first, by burning them, and, second, by destroying their cover and leaving them exposed to the rigors of winter. The first method requires either that sufficient heat shall be generated to effect their destruction or that they shall actually be partly or completely consumed by the fire. The first requires an unusually hot prairie fire, such as might result from the consumption of a very heavy cover. The second requires very close burning—consumption of the stems to within about half an inch of the crown. Little harm seems to be done to the bugs by ordinary

prairie fires, which do not burn closer than one inch from the crown.

The prime requisite, then, in firing the infested clumps of grass, is so to handle the fire as to make it burn close to the crown from which the stubble grows. The type of firing which gives this desirable result appears to vary with weather conditions and must be selected by the individual farmer at the time of treatment.

At this point it is worth while to consider the results of recent burning tests upon which the preceding conclusions are founded.

TABLE OF RESULTS FROM BURNINGS MADE RECENTLY
 IN ELLIS COUNTY.

Clump No.	Size of clump, diameter.	Date of burning.	Type of fire.	Degree of burning.	Total No. of living bugs.
1.....	5 inches.....	No burning.	No burning.		186
2.....	5½ ".....			258	
3.....	5 ".....			91	
4.....	4½ ".....			214	
5.....	5 ".....			1,111	
6.....	5 ".....	Nov. 19, '10...	Side fire.....	Within 2 inches of crown.....	488
7.....	5 ".....	" " ".....	".....	Almost to crown.....	2
8.....	5½ ".....	" " ".....	Back fire.....	Almost to crown.....	1
9.....	5½ ".....	" " ".....	".....	Within 1 inch of crown.....	441
10.....	3 ".....	" " ".....	Head fire.....	Almost to crown.....	0

The Ellis county table shows: (1) That the clumps of bunch-grass averaging five inches in diameter contained about 400 bugs each; (2) that the prime requisite for destruction of the bugs is close burning; (3) that close burning will destroy practically 100 per cent; (4) that the direction from which the fire comes has little to do with its efficiency, and that in all probability different conditions of weather and locality will render different types of firing suitable at different places and at different times in the same place.

IN SUMNER COUNTY.

Clump No.	Size of clump, diameter.	Date of burning.	Total No. of bugs.	Total No. bugs killed.	Percentage killed.
1.....	3½ inches.....	Nov. 11, '10.....	2,574	2,134	86.4
2.....	2½ ".....	" " ".....	111	88	74.7
3.....	3½ ".....	" " ".....	1,074	434	45
4.....	2 ".....	" " ".....	211	175	83
5.....	2½ ".....	" " ".....	960	459	48

The Sumner county table shows: (1) That the clumps of bunch-grass three inches in diameter sheltered an average of 1000 bugs apiece; (2) that running fire over infested grasses under varied conditions will destroy 43 per cent to 86.4 per cent of the bugs. The notes show that clump No. 1 in the Sumner county table had a stubble one inch long, but they also show that the cover was unusually heavy and that the heat generated was correspondingly high. Evidently, therefore, when the heat generated is for any reason unusually great the burning may not be so close and yet be effective. All things considered, however, in general the secret of destroying the bugs directly appears to lie in close burning of the infested grass clumps.



FIG. 4. The type of burning that kills few bugs—not close enough.



FIG. 5. The type of burning that kills practically 100 per cent of the bugs.

There will be a question in the minds of some as to whether close burning will not injure pasture lands and meadows. Most farmers with whom we have worked believe that it will not seriously harm the grass or decrease the yield, especially when done only once in several years. In this connection it is worth while to note that while parts of the railroad right of way are burned off every fall, the grass is not killed out.

CONCLUSION.

1. The chinch bugs have gathered in dangerous numbers in the clump-forming grasses of the badly infested parts of the state.
2. Most of the bugs can be destroyed by running fire over

the infested grass lands in such a way as to burn the clumps down close to the crowns, and the balance will thereby be exposed to the rigors of winter.

3. Never have conditions for winter destruction of chinch bugs been better. The grasses are so dry that close burning is easy.

4. Neglect to destroy these bugs, and with winter, spring and summer favorable to them, wheat, corn, cane and Kafir will suffer severely, and will in many cases be completely destroyed.

Approved:

ED. H. WEBSTER. *Director.*

MANHATTAN, KAN., November 28, 1910.