

## **Overwintering Boll Weevil Studies, Texas High Plains. 1999-2001**

A cooperative study between Stan Carroll, Texas Agricultural Experiment Station  
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### Overwintering site summary bullets:

The percent of sites examined with either live or dead weevils remained about the same in the two inactive eradication zones but was markedly reduced in the three active eradication zones. This would indicate that boll weevils distribution remained about the same between 2000 and 2001 where no eradication activities took place but was decreased by eradication treatments in the three active zones. Table 1.

The total number of boll weevils found in overwintering sites in 2001 was greatly reduced compared to previous years. This reduction was across the board, regardless of eradication activity status. This reduction may be due to fewer boll weevils in diapause status at the end of the season, a consequence of early cutout last year. Reproductive boll weevils may not seek overwintering sites following a plant-killing freeze. Table 2.

The number of total boll weevils found inside the three active eradication zones in the 2001 survey was reduced 83% as compared to the number in the two inactive zones. A similar trend was observed in the 2000 survey following a single diapause program where an 86% reduction was observed. These reductions appear to be the result of the eradication program and not differential weather patterns. Table 2.

The percent of live weevils to total boll weevils found in the site survey was greatly reduced in 2001. Only 7% of all weevils found were alive compared to 43 percent in the 2000 and 46% in the 1999 site survey. A lesser number percentage (2%) was found alive in active eradication zones as compared to inactive zones (14%). Table 3.

### Dig-up cage study summary bullets:

Survival of boll weevils in the dig-up cage studies was lower this year than in previous years. Both the Slaton and Plainview sites had very low survival which was in line with that observed in the site survey. The Seminole site survival was significantly higher than the other two sites. No explanation for this discrepancy was found. The site survey conducted in Gaines County (Seminole) found no live weevils this year. Table 4.

Dig-up cage studies have been conducted at the Slaton site since 1998. Survival was 57% in 1998, 34% in 1999, and 41% in 2000; for an average of 44%. This is 10 times higher than the 4% observed in 2001. Table 4.

### Overall summary:

Based on the survey and dig-up cage data, it would appear that a greatly reduced number of boll weevils made it into overwintering sites in late 2000 and that survival was very low for these weevils. No single weather event could be

identified to be the cause of this mortality. Our coldest period was accompanied by snow which provided an insulating blanket over the overwintering sites, shielding the weevils from the cold temperatures (based on temperature probe readings in the habitat and air temperatures. It is thought that maybe the accumulative effects of short duration cold periods were responsible for this significantly decreased survival.

We would expect far fewer weevils to emerge this spring/summer, giving both cotton producers and the Texas Boll Weevil Eradication Foundation a reprieve from previous high weevil years.

Active eradication zones should have very low boll weevil emergence, perhaps gaining producers a full year on the time table for eradication.

Table 1. Boll weevil overwintering site survey, percent of sites infested. Texas High Plains. 1999-2001.\*

<b>Eradication zone</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Western	94	56	19
Permian Basin	100	37	13
Northwest	47	47	13
Northern High Plains	63	100	87
Southern High Plains/ Caprock	90	55	48

\*Overwintering sites were from 12 counties with an average of 8 sites per county. These sites contained broadleaf litter. A total of 3 one M<sup>2</sup> samples were taken from each site.

Table 2. Boll weevil overwintering site survey, total boll weevils per acre of habitat sampled. Texas High Plains. 1999-2001.\*

<b>Eradication zone</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Western	18,338	5,109	776
Permian Basin	21,584	843	843
Northwest	1,264	927	168
Northern High Plains	1,349	16,188	168
Southern High Plains/ Caprock	15,041	17,300	1,540

\*Overwintering sites were from 12 counties with an average of 8 sites per county. These sites contained broadleaf litter. A total of 3 one M<sup>2</sup> samples were taken from each site.

Table 3. Boll weevil overwintering site survey, percent of total weevils found alive. Texas High Plains. 1999-2001.\*

<b>Eradication zone</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Western	52	36	6
Permian Basin	52	80	0
Northwest	49	12	0
Northern High Plains	28	68	9
Southern High Plains/ Caprock	52	68	18

\*Overwintering sites were from 12 counties with an average of 8 sites per county. These sites contained broadleaf litter. A total of 3 one M<sup>2</sup> samples were taken from each site.

Table 4. Overwintering boll weevil dig-up cage study, percent survival. Texas High Plains, 2000/2001.

<b>Examination date*</b>	<b>Seminole site</b>	<b>Slaton site</b>	<b>Plainview site</b>
November 21	100	100	100
January 5	92	78	53
February 14	67	28	16
March 29	52	4	4
April 19	33	4	3

\*Five dates selected from 8 examination dates.

Selected dig-up cage sites represent relatively high quality overwintering habitat (broadleaf litter). Adult boll weevils were reared from infested fruit late in the season and fed for 22-3 weeks before release into cages. These weevils represent diapause weevils with good fat deposits and therefore do not necessarily represent the true population of weevils overwintering in the wild.

##Extension IPM Agents Brant Baugh, Tommy Doederlein, Scott Russell, Kerry Siders, Steve Davis, Cherinell Riley, Emilio Nino and former Extension IPM Agents Clyde Crumley and Johnna Patterson; and Mark Arnold with the Texas Agricultural Experiment Station were a part of the survey team. Plains Cotton Growers, Inc. provided partial funding of this multi-year project.