

FINDING A WEEVIL IN A HAYSTACK?

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Abstract

The use of large round hay bales by boll weevils as possible overwintering sites in the South Texas/Winter Garden Zone of the Texas Boll Weevil Eradication Foundation program was explored in 2009. Boll weevil pheromone traps were placed upwind of several large round hay bale storage sites and monitored approximately weekly from late-March/early-April until the end of August. Numbers of boll weevils captured in traps placed at these sites were compared to those captured in the closest TBWEF program traps. In most cases, numbers of boll weevils captured at the hay bale storage sites were far greater than those captured in TBWEF traps. Those weevils were examined for pollen and other evidence that might indicate overwintering in hay bales but no conclusive data were found to prove the weevils were using the hay bales for overwintering. In 2010, we will add sites and more traps per site, as well as install emergence cages over hay bales to try to determine whether boll weevils are actually using these large round hay bales for overwintering.

Introduction

Boll weevil eradication in the South Texas/ Winter Garden Zone of the Texas Boll Weevil Eradication Foundation Program has proven to be particularly problematic for several reasons. The possibility of large round hay bales serving as overwintering sites was explored during 2009 as a follow-up to conversations regarding these problems, especially potential boll weevil overwintering sites, since boll weevils re-infesting Louisiana cotton fields were sometimes correlated with movement of these bales in the area (B.R. Leonard, personal communications).

Materials and Methods

During late-March/early-April, six large round hay bale outdoor storage sites were found north to northeast of Uvalde, TX, and a single boll weevil pheromone trap was placed upwind (for prevailing seasonal winds) of the hay bales at each site (Fig. 1). Pheromone traps were maintained with two Hercon® Luretape® pheromone strips and two Hercon® Vaportape™ II insecticidal strips that were marked with the date when placed in the trap; the older lure strip was removed and replaced with a fresh one weekly while the insecticidal strip was replaced every two weeks. Traps were monitored weekly and weevils were removed and numbers recorded. Numbers of boll weevils captured in these traps were compared to numbers from the closest TBWEF traps (Fig. 2). Five captured weevils also were examined by Dr. Gretchen Jones, USDA-ARS, for pollen grains, fungal spores, fungal hyphae and grass phytoliths in an effort to confirm their association with hay bales.

Results

Numbers of boll weevils caught in pheromone traps adjacent to hay bale sites ranged from 6 to 82 while numbers of weevils caught in TBWEF traps ranged from 0 to 74 (Table 1).

Table 1. Boll weevil trap capture data – totals and corollary TBWEF trap information

Trap No.	Total number of boll weevils caught in traps near hay bales	Total number of boll weevils caught in closest TBWEF traps	Distance from hay bales to closest TBWEF trap
Trap 2	72	1	0.25 mile
Trap 3	54	0	0.6 mile
Trap 4	48	3	1.0 mile
Trap 5	82	74*	250 yd
Trap 6	6	6**	75 yd

*This TBWEF trap was upwind of and in a direct line with the trap next to the hay bales

** This “hay bale trap” was mistakenly placed in a position that was not directly upwind (prevailing winds are southeasterly) of the hay bales but was placed south-southwest of the hay bales.

Trapping results for trap site 1 are not reported here since no weevil had been trapped when all of the hay bales were removed shortly after the study began. Several times, a large spike in weevil numbers trapped, at all hay bale trap sites would occur after a rainfall event exceeding 0.30 inch (Table 2); these spikes also correlated well with zone-wide but much smaller increases in numbers of weevils trapped by TBWEF. Similar, but smaller, spikes would occur in the numbers of weevils captured at trap site 2 when the producer would remove hay bales for feeding his livestock (Table 2). Based on trap data, it also appeared that weevil numbers were much higher in association with bales stored for two or more years.

Table 2. Weekly boll weevil trap capture data following rainfall events.

Date trap checked	Trap 2	Trap 3	Trap 4	Trap 5	Trap 6
10 May	9	8	3	12	2
18 May	6	0	2	4	0
27 May	26	10	11	27	N/A ¹
1 Jun	8	11	4	16	1
11 Jun	17	21	11	10	0

¹This trap had been run over, was down and damaged on this date

Discussion

Whether boll weevils are using large hay bale storage sites for overwintering wasn't definitively determined from the 2009 boll weevil trapping data nor from the microscopic examination of boll weevils for pollen grains, fungal spores, fungal hyphae and grass phytoliths. In an effort to make that determination in 2010, several additional large hay bale storage sites will be added to those that were trapped in 2009, as well as adding additional traps at each site. Trapping also will begin in January, 2010. Surface and core samples of the hay from large round hay bales will be taken and examined microscopically for pollen grains, fungal spores, fungal hyphae and grass phytoliths. Periodically, boll weevil traps will be checked daily to procure single boll weevils for corollary testing. Emergence cages also will be installed over some of the large round hay bales that have decomposed considerably. In the fall of 2009, many more large hay bales storage sites were established in the Winter Garden area, adding to the urgency of knowing if these hay bales are used by boll weevils for overwintering. It is important to determine if boll weevils use large hay bales for overwintering because of implications for boll weevil eradication. Those implications are far-reaching; for Texas, should weevil-infested hay bales be moved into a weevil-free zone but especially for the entire United States, if some of these bales were moved into another state.