STATUS OF BOLL WEEVIL ERADICATION IN TEXAS

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Abstract

The Texas Boll Weevil Eradication Foundation (TBWEF) completed a successful year in 2009. Boll weevil eradication activities were carried out in all Texas and eastern New Mexico cotton fields, on a total of 5,410,346 certified cotton acres. For the year, every zone reported either no weevil captures, or reductions in boll weevil captures compared to 2008. As in 2008, however, a late season migration of boll weevils into the Southern Rolling Plains (SRP) zone did cause trap captures and treatments to increase in the fall. Nevertheless, overall SRP trap captures were lower in 2009 than in 2008.

Introduction

During the 20th century, the boll weevil has been responsible for more dollars spent in control costs and given up in crop losses than any other cotton pest in Texas. In fact, the National Cotton Council estimates that since the boll weevil crossed the Rio Grande river about 1892 (Hunter and Hinds 1905) it has cost U.S. cotton producers more than $13 billion (NCC 1994). Following successful experiences with cooperative boll weevil eradication experiments in Mississippi, Louisiana and Alabama in 1971, and a successful three-year boll weevil eradication trial in North Carolina and Virginia from 1977-80, growers requested program expansion to other regions of the United States beginning in 1983 (El-Lissy 1998). As a result, active programs were established in the Southeastern and Southwestern United States from 1983 through the mid-1990's. Cotton producers there put together programs that were successful in eradicating the boll weevil from those regions. After 1994, boll weevil eradication programs moved into the center of the U.S. Cotton Belt and programs were initiated in the mid-South, Oklahoma, New Mexico and Texas (Brashear and Brumley 2001).

The history of the boll weevil and the destruction it caused, the struggle farmers endured each year for most of the 20th century to find a way to keep weevils from destroying their cotton crop, and the eradication effort are well documented (Dickerson et al. 2001 and Allen 2008). It is a story of stunning losses, disappointment, tenacity, sacrifice and innovation. But, the eradication program in Texas and across the Cotton Belt is well on the way to the successful elimination of the boll weevil, thereby bringing a happy ending to the boll weevil story for the nation's cotton growers.

Although dates and specifics of start-up and retention referenda for Texas and Eastern New Mexico zones have been provided in previous Beltwide Cotton Conference proceedings (Allen et al. 2006, Allen et al. 2007, Allen et al. 2008 and Allen et al. 2009), in 2009 several subsequent referenda were held in Texas. The Northern Blacklands (NBL) zone passed a retention referendum in January with 98 percent voting to continue the program. The Southern Blacklands (SBL) zone passed a referendum in March with 97 percent voting in favor. The El Paso Trans Pecos (EPTP) zone passed its retention referendum in May with 95 percent of its voters electing to continue.

In recent years, boll weevil eradication has freed Texas cotton producers from the economic damage caused by the boll weevil for the first time since the weevil became established in the state (1892 – 1905). Concurrently, Texas has been experiencing record yields beginning with the cotton crops of 2004 and 2005 which are recorded as the two largest crops in Texas history. And, although the 2006 crop was severely limited by drought, it was still documented as the fourth largest crop on record. The 2007 cotton crop received abundant rainfall and went into the record books as the second largest cotton crop ever produced in Texas. These four crops have taken four of the top five places in Texas cotton production history. In 2008 the Texas cotton crop struggled from severe weather. From early spring through late July the weather was hot, dry and windy in Eastern and Central Texas. On the Plains, sand storms, drought, hail storms and an unusually cool spring delayed cotton planting and prevented stand establishment in many fields. Very dry weather in many areas of the High Plains contributed to crop failure on 1.4 million acres, 1.1 million of which were south of Lubbock. Similarly, dry weather in South Texas caused the loss of 76,000 acres in the South

Texas/Winter Garden (STWG) zone. Hurricane Dolly made landfall in the Lower Rio Grande Valley (LRGV) on July 23 causing a near total loss of the cotton crop and spreading cotton seed and boll weevils widely. Rainy weather continued until October in some areas of South Texas while the drought continued further north. Hurricane Ike came ashore at Galveston on Sept. 13 spreading rain and boll weevils around the Upper Costal Bend (UCB), STWG, SBL and NBL zones. In 2009, the Texas cotton crop again struggled due to weather. Dry conditions in South and West Texas played havoc with germination early season, followed by continued dry weather into the summer. Crop abandonment exceeded 1.2 million acres statewide by early fall with the bulk of the acres contained in the STWG, Western High Plains (WHP), and Southern High Plains Caprock (SHPC) zones.

Methods

El-Lissy (et al. 1997) provided a detailed description of the boll weevil eradication methods used in the Texas program. Since that time, the only modifications have been in data management and management of secondary pests.

Discussion

Volunteer cotton in corn and grain sorghum fields was a problem in several areas of South Texas in 2008 and in a limited area in 2009. Volunteer cotton grew from seed dropped during the 2008 harvest and from cotton that was planted, then failed and followed by grain sorghum and corn. Many producers used herbicides and improved cultural control in 2009 to avoid the problems seen in 2008. As a result, boll weevil numbers were reduced significantly. Increased grower support in volunteer cotton control, TBWEF eradication efforts, and droughty conditions contributed to the reduction in boll weevil numbers seen in 2009. Unfortunately, late season rainfall in key areas prevented a normal harvest, and has prevented complete crop destruction in 2009. As of Dec. 1, 2009, there were over 19,101 acres still hostable in the southern part of the state. TBWEF personnel were also prevented from making normal treatments and trap inspections due to the extended period of moisture.

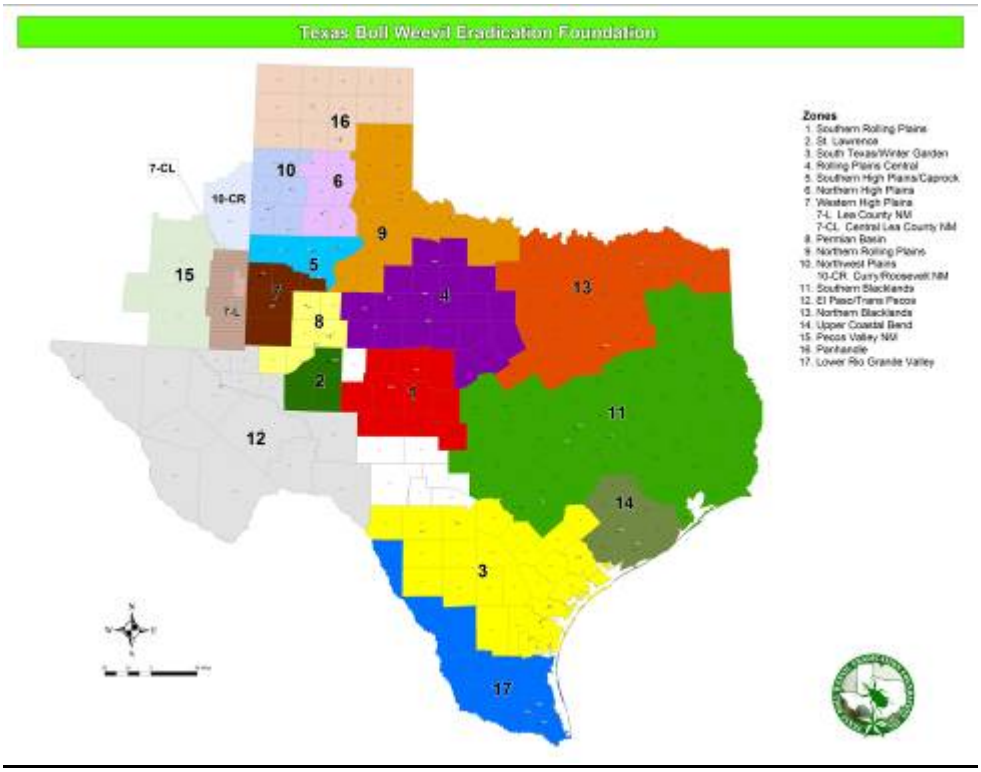

Figure 1. Boll weevil eradication zones operated by TBWEF.

West Texas Zones

In the West Texas zones, 2009 proved to be a good year for boll weevil eradication. In the 4.732 million acres that make up the 11 West Texas zones, only 206 weevils were captured throughout the year. . This was a reduction of 76 percent overall from the 883 weevils caught in 2008.

The majority of the weevils trapped in West Texas in 2009 were caught in the southern end of the SRP zone. There, 205 weevils were caught south of San Angelo. Additionally, one weevil was caught in the STL zone. This weevil was caught mid-summer next to a watermelon field located in the center of the zone. No further weevil captures were detected the remainder of the year. The SRP and STL zones were the only two West Texas zones that captured weevils in 2009.

In 2009, program personnel treated 56,650 cumulative acres in the West Texas region for boll weevil compared to 147,548 acres treated in 2008. Of the 2009 acres treated, 56,009 were in the SRP zone. This is a 61 percent reduction from the 144,828 acres treated in the SRP zone in 2008.

South and East Texas Zones

Boll weevil captures in 2009 were reduced in the South and East Texas zones by 84 percent compared to 2008. In addition, the number of treatments in the five South and East Texas zones decreased by over 1.9 million acres, from 3,868,313 acres to 1,951,712 acres. Droughty conditions in the STWG zone contributed to a lower number of acres treated and carried to harvest.

The NBL, UCB and LRGV zones contributed to the boll weevil population reduction by; 96, 99 and 85 percent, respectively. In the STWG zone, 232,429 weevils were captured compared to 1,501,624 weevils captured in 2008, or an 84 percent reduction in boll weevil numbers. In the SBL, 30,636 weevils were caught in 2009 compared with 142, 918 in 2008, or a 78 percent reduction in boll weevil numbers.

The absence of tropical weather and an extreme drought enhanced TBWEF eradication efforts and allowed for significant program gains. However, poor stalk destruction, migration, and boll weevil detection issues associated with irrigation continue to be problems in isolated areas of some South Texas zones. In the higher weevil areas, traps did not trigger fields in the early to mid-season when weevils were present in the field. Several research projects began in 2009 to help identify some of these detection problems. Extremely high numbers of boll weevils were also captured in 2009 non-cotton fields that were planted to cotton in 2008 and not planted to cotton in 2009. As of result of these and other issues, both 2010 planted cotton fields and 2009 fields planted to other crops in 2010 will be trapped in 2010.

Statewide Totals

In 2009, statewide weevil captures were reduced 84 percent, from 1,939,045 in 2008 to 304,942 in 2009. Also, cumulative treated acres were reduced from 4,015,861 in 2008 to 2,008,362 in 2009, or a 50 percent reduction in total acres treated.

Table 1. Annual average weevils caught per trap inspection in active boll weevil eradication zones 1999-2009.

Zone	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TX											
SRP	0.0023	0.00009	0	0.00005	0.00064	0.0013	0.0074	0.00008	0.022	0.0028	0.0007
RPC	0.14	0.028	0.00053	0.0089	0.0044	0.012	0.0031	0.00005	0.00014	0.0000058	0
ST/WG	1.53	1.12	0.16	0.144	0.16	0.67	0.21	0.045	1.08	1.07	0.13751
EP/TP	0.21	0.0093	0.00032	0.00052	0.012	0.00009	0.00029	0	0	0	0
NRP	18.54	2.34	0.056	0.0019	0.00005	0.00025	0.00015	0.000002	0	0.0000022	0
NWP	7.23	1.3	0.015	0.0009	0.00001	0	0.000003	0	0	0	0
PB	9.99	0.42	0.0097	0.028	0.014	0.026	0.017	0.00044	0.00016	0	0
WHP	18.2	0.68	0.021	0.0026	0.00017	0.00034	0.0004	0.00001	0	0.0000067	0
NHP			0.89	0.0045	0.00002	0.00002	0.000028	0.000003	0	0	0
SBL			13.68	1.36	0.356	0.52	0.19	0.099	0.24	0.27	0.0826
SHP/C			1.16	0.0047	0.00004	0.00013	0.00029	0.00003	0.0000016	0.0000045	0
UCB				18.22	3.34	1.59	0.29	0.23	0.11	0.0075	0.00011
PH						0	0	0	0	0	0
STL						3.23	0.26	0.00625	0.00038	0.000053	0.00001
NBL							11.47	0.41	0.086	0.014	0.0011
LRGV							16.12	2.97	2.66	0.85	0.1425
NM											
C/RNM			1.1	0.0037	0.00004	0	0.00006	0	0	0	0
CLCNM		1.83*	0.11*	0.029	0.00009	0	0.00035	0	0	0	0
LCNM		1.83*	0.11*	0.046	0.00019	0.0001	0.00021	0	0	0	0
PVNM			2.49	0.96	0.05	0.0026	0.00005	0	0	0	0

* Data not separated between zones

Table 2. Annual average number of ULV malathion applications per acre[1] 1999-2009.

Zone	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TX											
SRP	0.64	0.01	0	0.087	0.23	0.79	0.91	0.033	1.84	0.69	0.25
RPC	3.12	1.52	0.15	0.91	0.89	1.37	0.44	0.025	0.024	0.018	0
ST/WG	6.24	8.05	4.8	2.92	4.15	5.39	4.02	1.14	3.31	4.32	1.74
EP/TP	3.42	0.96	0.14	0.11	0.097	0.02	0.06	0	0	0	0
NRP	9.21	9.11	2.22	0.53	0.103	0.23	0.09	0.0008	0	0.00049	0
NWP	5.85	7.36	1.57	0.3	0.013	0	0.002	0	0	0	0
PB	7.08	3.63	0.52	1.34	3.09	2.37	1.66	0.17	0.017	0	0
WHP	9.23	6.19	1.41	0.38	0.176	0.35	0.5	0.00035	0	0.00017	0
NHP			9.59	0.71	0.033	0.06	0.03	0.001	0	0	0
SBL			7.86	18.58	11.6	11.05	8.39	6.32	6.43	7.07	13.05
SHP/C			6.83	1.08	0.087	0.24	0.33	0.0099	0.00017	0.00055	0
UCB				9.71	16.3	16.79	11.09	13.24	12.01	5.69	0.594
PH						0	0	0	0	0	0
STL						7.02	4.52	0.6	0.22	0.005	0.0037
NBL							9.4	9.97	7.89	2.93	0.848
LRGV							4.37	4.12	9.47	9.56	5.56
NM											
C/RNM			3	1.01	0.015	0	0	0	0	0	0
LCNM		9.3*	6.03*	2.63	0.014	0	0.59	0	0	0	0
LCNM		9.3*	6.03*	5.16	0.22	0.016	0.24	0	0	0	0
PVNM			8.64	8.17	7.83	1.46	0.31	0	0	0	0

[1] Mapped cotton acres.

* Data not separated between zones.

Summary

Texas cotton producers have set all-time production records in three of the last six years. Boll weevils have been reduced to below economic damage levels in all areas of the state. The elimination of economically damaging populations of boll weevils is a key factor that has enabled growers to produce record crops. Four New Mexico and 11 West Texas zones are approaching program completion. In addition, strong progress was made in the NBL and UCB zones in 2009. Program operations in 2010 in the STWG, UCB, NBL, and SBL will concentrate on identification, trapping and treatment of all cotton (including volunteer cotton in other crops and non-crop areas) and working with the Texas Department of Agriculture (TDA) to achieve early, thorough stalk destruction.

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