STATUS OF BOLL WEEVIL ERADICATION IN TEXAS

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Abstract

The Texas Boll Weevil Eradication Foundation (TBWEF) completed a successful year in 2011. Boll weevil eradication activities were carried out in all Texas and eastern New Mexico cotton fields, on a total of approximately 7.7 million certified land cotton acres.(Figure 1) For the year, 15 of 16 zones reported either no weevil captures, or reductions in boll weevil captures compared to 2010. Boll weevil numbers were reduced substantially in the South Texas Winter-Garden (STWG) zone and the Southern Blacklands (SBL) zone. The Lower Rio Grande Valley (LRGV) zone experienced an increase in weevil numbers over 2010.

Introduction

During the twentieth 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 (NCC) 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 3-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 mid-1990. Cotton producers in those areas 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 twentieth 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.

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. And, although the 2006 crop was severely limited by drought, it was still documented as the fifth 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 STWG zone. Hurricane Dolly made landfall in the 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 made seed germination difficult. The dry conditions continued into the summer and crop abandonment exceeded 1.2 million acres statewide. A large percentage of the abandoned acres were in the STWG, Western High Plains (WHP), and Southern High Plains Caprock (SHPC) zones. The 2010 cotton crop began the year with adequate moisture in most areas and had a very low number of acres abandoned. Despite suffering a dry spell mid-

season, the crop advanced to produce the third largest crop of record. Yields also were recorded at an average of 717 pounds per acre. Fall weather conditions helped finish the crop which allowed for rapid harvest and ginning of the crop with minimal weather delays. In 2011, a record drought contributed to a large abandonment of acreage and poor production on irrigated crops. Over 2 million acres did not receive timely rainfall to enable the cotton to germinate. Stress on the irrigated crop with very high temperatures during the bloom and boll setting stage contributed to lower yields. Eventually 4.35 million acres were abandoned leaving 2011 with the lowest harvested acres since 1885.

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 limited areas in 2009. Volunteer cotton grew from seed dropped during the 2008 and 2009 harvest and from cotton that was planted, failed and planted to an alternate crop. Many producers used herbicides and improved cultural control in 2010 to avoid the problems encountered in 2008 and 2009. As a result, boll weevil numbers were reduced significantly. Increased grower support in volunteer cotton control and TBWEF eradication efforts contributed to the reduction in boll weevil numbers seen in 2010 and 2011 in these areas. Unfortunately, by the end of the 2010 harvest, drought had begun across wide areas of Texas. This drought continues today and threatens 2012 cotton production areas of Texas should rainfall fail to return to normal levels. Because of the continued dry weather, producers have been able to destroy stalks and render most fields un-hostable at this time.

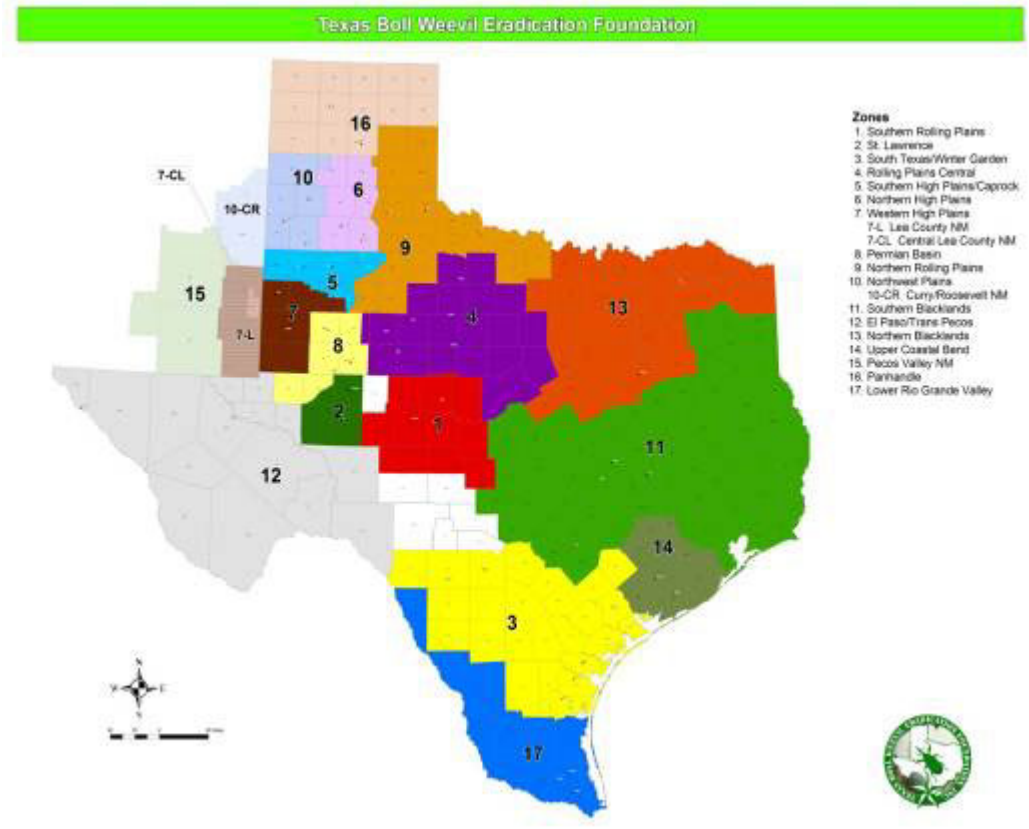


Figure 1. Boll weevil eradication zones operated by TBWEF.

Table 1. Average Land Acres Planted 2001-2011 Compared to 2011 Planted Acreage

Zone	Average Total Certified Land Acres	2011 Total Certified Land Acres	2011 Quarantine Status
LRGV	137,663	198,934	Active Program
STWG	444,229	560,050	Active Program
UCB	163,844	214,348	Active Program
SBL	94,301	171,989	Active Program
NBL	71,735	116,448	Active Program
SRP	240,150	345,490	Functionally Eradicated
RPC	620,269	801,143	Functionally Eradicated
EPTP	41,643	49,853	Functionally Eradicated
NRP	375,946	514,043	Functionally Eradicated
STL	165,123	203,429	Functionally Eradicated
PB	759,031	791,938	Functionally Eradicated
WHP	858,025	978,661	Functionally Eradicated
SHPC	1,198,982	1,316,279	Functionally Eradicated
NWP	464,852	561,101	Functionally Eradicated
NHP	537,299	744,386	Functionally Eradicated
PH	104,788	204,073	Functionally Eradicated
Totals	6,277,881	7,772,165	Functionally Eradicated

West Texas Zones

In the West Texas zones, 2011 proved to be another banner year for boll weevil eradication. Weevil numbers in these zones were reduced by 100 percent as compared to 2010. In the 6.7 million land acres that make up the 11 West Texas zones in 2011, there were no boll weevils captured compared to only 15 weevils captured in 2010 and 206 weevils captured in 2009. There were no acres treated in the 6.7 million land acres that were planted in West Texas. All 11 West Texas zones have been declared functionally eradicated.

South and East Texas Zones

Boll weevil captures in 2011 were reduced in the South and East Texas zones by 7.3 percent compared to 2010. Only three of the five zones captured weevils in 2011. The UCB zone and the NBL zone did not capture a weevil in 2011. The number of acres treated in the five South and East Texas zones decreased from 2,411,039 acres in 2010 to 884,521 acres in 2011 or a 63.3 percent reduction in treatments.

In the STWG zone, 173 weevils were captured in 2011 compared to 54,540 weevils captured in 2010, or a 99.68 percent reduction in boll weevil numbers. Most of the weevils captured in STWG were captured in the Uvalde area. In SBL, 28 weevils were captured in 2011 compared with 8,021 in 2010, or a 99.65 percent reduction in boll weevil numbers. The 28 weevils were captured in the Brazos bottom area with the last capture occurring in early August. The Foundation failed to find any fields with reproduction in SBL during the 2011 season.

The Lower Rio Grande Valley of Texas increased acreage 118 percent in 2011. Boll weevil numbers also increased from 163,399 weevils in 2010 to 209,092 in 2011or a 28 percent increase in weevils. Acreage treated for boll weevils also increased from 610,439 acres in 2010 to 780,027 in 2011. Progress was still made in the northern areas of LRGV with over 1,900 fields that failed to capture a weevil in 2011. The LRGV zone continues to experience challenges in the program. Some of the high weevil count fields are located in drug trafficking areas and there are safety issues associated with trap inspection and treatment. Most weevil captures are occurring in the border area along the Rio Grande River. The NCC has initiated an International Technical Advisory Committee to improve communication and enhance program progress on both sides of the border.

Statewide Totals

In 2011, statewide weevil captures were reduced 7.3 percent, from 225,964 in 2010 to 209,293 in 2011. Cumulative treated acres decreased from 2,411,039 acres in 2010 to 884,521 acres in 2011 or a 63.3 percent reduction in treatments.

Table 2. Annual average weevils caught per trap inspection in active boll weevil eradication zones 1999-2011.

Average Number of Boll Weevils Per Trap Season Long

Zone	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
SRP	0.0023	0.00009	0	0.00005	0.00064	0.0013	0.0074	0.00008	0.022	0.0028	0.0007	0.00005	0
RPC	0.14	0.028	0.00053	0.00089	0.0044	0.012	0.0031	0.00005	0.00014	0.0000058	0	0	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	0.045	0.00008
EP/TP	0.21	0.0093	0.00032	0.00052	0.012	0.00009	0.00029	0	0	0	0	0	0
NRP	18.54	2.34	0.056	0.0019	0.00005	0.00025	0.00015	0.00002	0	0.0000022	0	0	0
NWP	7.23	1.3	0.015	0.0009	0.00001	0	0.00003	0	0	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	0	0
WHP	18.2	0.68	0.021	0.0026	0.00017	0.00034	0.0004	0.00001	0	0.0000067	0	0	0
NHP			0.89	0.0045	0.00002	0.00002	0.00028	0.00003	0	0	0	0	0
SBL			13.68	1.36	0.356	0.52	0.19	0.099	0.24	0.27	0.0826	0.011	0.000026
SHP/C			1.16	0.0047	0.00004	0.00013	0.00029	0.00003	0.0000016	0.0000045	0	0	0
UCB				18.22	3.34	1.59	0.29	0.23	0.11	0.0075	0.00011	0.00002	0
PH						0	0	0	0	0	0	0	0
STL						3.23	0.26	0.00625	0.00038	0.0000053	0.00001	0	0
NBL							11.47	0.41	0.086	0.014	0.0011	0.00001	0
LRGV							16.12	2.97	2.66	0.85	0.1425	0.382	0.152
NM													
C/RNM			1.1	0.0037	0.00004	0	0.00006	0	0	0	0	0	0
CLCNM		1.83*	0.11*	0.029	0.00009	0	0.00035	0	0	0	0	0	0
LCNM		1.83*	0.11*	0.046	0.00019	0.0001	0.00021	0	0	0	0	0	0
PVNM			2.49	0.96	0.05	0.0026	0.00005	0	0	0	0	0	0

[1] Mapped cotton acres.

* Data not separated between zones.

Table 3. Annual average number of ULV malathion applications per acre[1] 1999-2011.

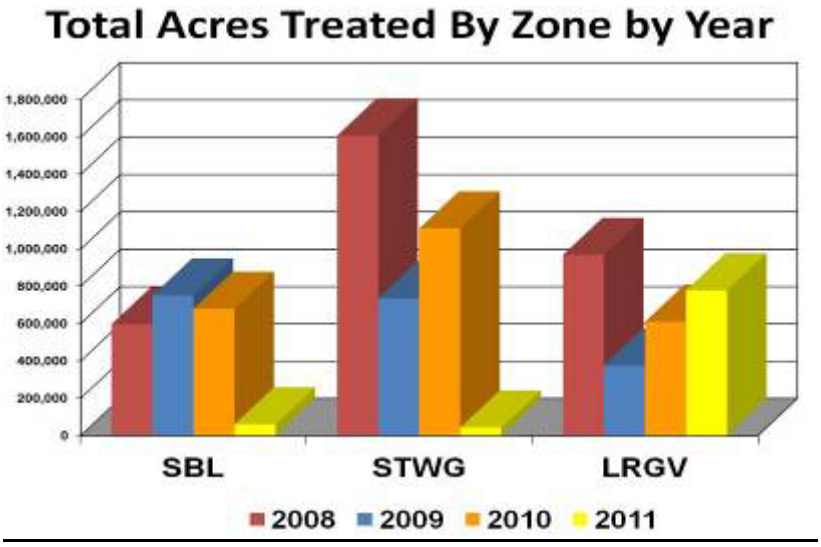
Zone	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
SRP	0.64	0.01	0	0.087	0.23	0.79	0.91	0.033	1.84	0.69	0.25	0.04	0
RPC	3.12	1.52	0.15	0.91	0.89	1.37	0.44	0.025	0.024	0.018	0	0	0
ST/WG	6.24	8.05	4.8	2.92	4.15	5.39	4.02	1.14	3.31	4.32	1.74	2.73	0.077
EP/TP	3.42	0.96	0.14	0.11	0.097	0.02	0.06	0	0	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	0	0
NWP	5.85	7.36	1.57	0.3	0.013	0	0.002	0	0	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	0	0
WHP	9.23	6.19	1.41	0.38	0.176	0.35	0.5	0.00035	0	0.00017	0	0	0
NHP			9.59	0.71	0.033	0.06	0.03	0.001	0	0	0	0	0
SBL			7.86	18.58	11.6	11.05	8.39	6.32	6.43	7.07	13.05	7.83	.353
SHP/C			6.83	1.08	0.087	0.24	0.33	0.0099	0.00017	0.00055	0	0	0
UCB				9.71	16.3	16.79	11.09	13.24	12.01	5.69	0.594	0.004	0
PH						0	0	0	0	0	0	0	0
STL						7.02	4.52	0.6	0.22	0.005	0.0037	0	0
NBL							9.4	9.97	7.89	2.93	0.848	0.009	0
LRGV							4.37	4.12	9.47	9.56	5.56	6.69	3.91
NM													
C/RNM			3	1.01	0.015	0	0	0	0	0	0	0	0
LCNM		*9.3**	*6.03**	2.63	0.014	0	0.59	0	0	0	0	0	0
LCNM		*9.3**	*6.03**	5.16	0.22	0.016	0.24	0	0	0	0	0	0
PVNM			8.64	8.17	7.83	1.46	0.31	0	0	0	0	0	0

Average Number of Malathion Applications per Acre

[1] Mapped cotton acres.

* Data not separated between zones.

Table 4. Annual Acres Treated by Zone 2008-2011.



Summary

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 continue to produce record crops. Four New Mexico and 11 West Texas zones are approaching program completion. In addition, substantial progress was made in the SBL and STWG zones in 2011. Program operations in 2012 in the STWG, LRGV, 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.

Acknowledgments

The authors wish to thank the Board of Directors of the TBWEF for the support and personal sacrifices they have made toward the goal of eradication of the boll weevil from Texas cotton. We deeply appreciate the selfless service of Chairman Woody Anderson, Vice Chairman Don Parrish, Secretary Weldon Melton, Treasurer John Inman, and members Keith Watson, Larry Turnbough, Keith Bram, Eddy Herm, Craig Shook, John Norman, Kenneth Gully, Carey Niehues, Neil Walter, Joe Alspaugh, John Saylor, Ron Craft, Steven Beakley, Robert Bailey, Mike Wright, Thomas Mengers and Sam Simmons.

We wish to thank the many producers who serve on our grower steering committees and the thousands of growers who support the program by maintaining good communications with program personnel and payment of their assessments. We are indebted to the grower organizations that provide communications with growers, leadership, program inputs and political support.

We thank state and federal legislators who have supported the program with legislative and financial assistance.

We thank Texas Department of Agriculture Commissioner Todd Staples and the many dedicated TDA employees for essential program oversight, administration of the stalk destruction program, for conducting necessary referenda, operating the Texas boll weevil quarantine program and for other program support. We thank the New Mexico Department of Agriculture for their assistance and support with the program in New Mexico zones operated by TBWEF.

Also, we wish to thank Aaron Miller, Philip Garcia, Sherry Sanderson, Jim Schoenholz, and other USDA-APHIS personnel for their knowledge, guidance, and assistance.

Additionally, we thank Dr. John Westbrook, Dr. Charles Suh, Dr. Henry Marshall, Scott Armstrong, Sasha Greenberg, and many others with USDA-ARS and Texas A&M for the research base that has provided the technical foundation for the program. Special thanks go to Dr. Tom Fuchs, Chairman of the TBWEF Technical Advisory Committee and committee members Dr. Ray Frisbie, Dr. Chris Sansone, Dr. Roy Parker, Dr. Don Rummel, Dr. Dan Fromme, Dr. Charles Suh, Dr. Don Parker, Dr. James Boston, Dr. Charles Allen, Roger Haldenby, and David Kostroun for their work in the area of technical program direction and oversight. Also we thank our many cooperating partners in Texas AgriLife Extension for their work in communicating program needs and goals to producers and others in the community.

Finally, we wish to thank the many people who have worked as employees of the Texas Boll Weevil Eradication Foundation. We thank them for their commitment to the program and for working the long hours required each day until the job is done. We thank Edward Herrera, Lyn Vandiver, Johnny Aten, Michael Hester, DeAnn Yates, Barbara Jones, Wes Jones, Cleve Cleveland, Randal Schwartz, Mark Stephenson, Georgeann Gooding, and Darrell Dusek, the zone managers for 2011 operations; and Assistant Zone Managers JoAnn Long, Rhonda Welch and Dwayne White. We thank the full-time and seasonal staff that works in the 16 Texas and four New Mexico zones operated by TBWEF for their hard work and dedication to the program. In addition, we thank the Abilene-based Headquarters staff for their commitment to the field staff and to Texas cotton growers.

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