STATUS OF BOLL WEEVIL ERADICATION IN TEXAS

C.T. Allen
L.E. Smith
L.W. Patton
R.O. Newman
Texas Boll Weevil Eradication Foundation
Abilene, TX

Abstract

The Texas Boll Weevil Eradication Foundation (TBWEF) completed a successful year in 2008. Boll weevil eradication activities were carried out in all Texas and eastern New Mexico cotton fields, a total of 5,522,489 cotton acres. Either no weevils or reductions in boll weevil captures compared with 2007 were seen in all but two zones. The weevil captures in the Southern Blacklands (SBL) and South Texas/Winter Garden (ST/WG) zones were unchanged from in 2007. As in 2007, a late season migration of boll weevils into the Southern Rolling Plains (SRP) zone caused trap captures and treatments to increase in the fall, but captures were lower in the SRP than in the fall of 2007.

Introduction

During the twentieth century, the boll weevil has been responsible for more dollars in control costs and crop losses than any other cotton pest in Texas. The National Cotton Council estimates that since the boll weevil crossed the Rio Grande river about 1892 (Hunter and Hinds 1905) it has cost US 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 1977-80, growers requested program expansion in other regions of the US beginning in 1983 (El-Lissy 1998). Active programs were established in the Southeastern and Southwestern US from 1983 through the mid-1990's. Cotton producers put together programs that succeeded in eradicating the boll weevil from those regions. After 1994, boll weevil eradication programs moved into the center of the U.S. cotton belt. 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. The eradication program in Texas and across the Cotton Belt is well on the way to successful elimination of the boll weevil, thereby bringing a happy ending to the boll weevil story for the nation's cotton growers.

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 and Allen et al. 2008). In 2008 several referenda and were held in Texas. The St. Lawrence (STL) zone passed a retention referendum in April with 96 percent voting to continue the program. The Panhandle (PH) zone passed its retention referendum in May with a 94 percent vote to continue. A third referendum was held in October in the Northern High Plains (NRP) zone. Eligible voters in the NHP voted to continue the program with 87 percent in favor of the measure. In November, 91 percent of voters in the Lower Rio Grande Valley (LRGV) zone voted in favor of continuing the program. And in December, 86 percent of those voting in the Southern High Plains/Caprock (SHP/C) zone voted to continue the program. Passage of referenda in these five zones made it possible for the program to continue on 1,974,030 cotton acres, 36 percent of the cotton acreage in the state.

In recent years, boll weevil eradication has freed Texas cotton producers from economic damage by the boll weevil for the first time since the weevils became established in the state (1892 – 1905). Concurrently, the Texas cotton crops of 2004 and 2005 were the two largest crops on record. The 2006 crop was severely limited by drought, yet was still 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 since cotton production records began being kept.

Materials and Methods

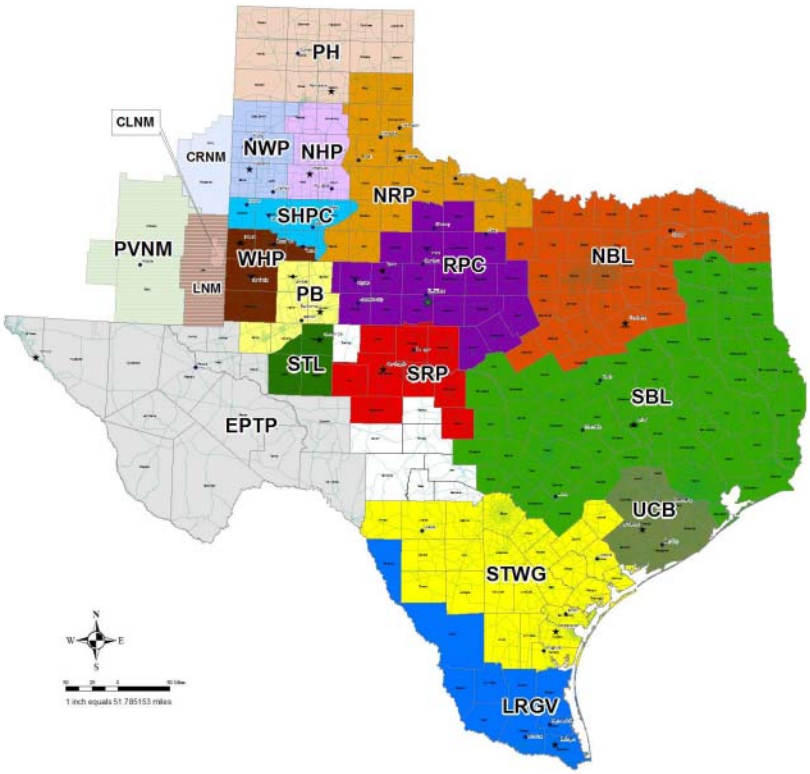
El-Lissy et al. (1997) provided a detailed description of the boll weevil eradication methods used in the Texas program. Since that time, the only modifications have been in data management and management of secondary pests.

Discussion

In 2008 the Texas/New Mexico 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 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 September 13 spreading rain and boll weevils around the UCB, ST/WG, SBL and NBL zones.

Volunteer cotton in corn and grain sorghum fields was a problem in several areas of South Texas. In the Uvalde District and west of Corpus Christi volunteer cotton grew from seed dropped during the 2007 harvest and from cotton that was planted, then failed and followed by grain sorghum. Weevil numbers increased in cotton growing in these situations. Rainfall caused delays in destruction of these volunteer cotton plants after the grain was harvested, exacerbating the problem. Boll weevils moving out of the Uvalde area were caught on trap lines south of the SRP zone and later within the SRP zone.

Figure 1. Boll weevil eradication zones operated by TBWEF.



West Texas Zones

2008 was a good year for boll weevil eradication in the west Texas zones. Eight hundred and eighty-three weevils were caught in the 4.8 million acres in the eleven West Texas zones during the year. This was a reduction of 86 percent from the 6,354 weevils caught in 2007.

The majority of the weevils trapped in West Texas in 2008 were caught in the southern end of the SRP zone. Eight hundred and sixty-six weevils were caught south of San Angelo. Of these only eighteen were caught through July. These weevils are believed to have moved into the zone in the fall of 2007 and successfully overwintered. Eight hundred and forty-eight weevils were caught August to December. Weevils were not caught on the south trap line prior to August but were caught from August on, indicating boll weevil movement from the ST/WG zone northward toward the SRP and STL zones. Twelve weevils were caught in the STL zone. All of the weevils caught in the STL were caught after October 20 in the southernmost fields in the zone.

Single weevils were caught in 2008 in the Northern Rolling Plains (NRP), SHP/C and WHP zones and two weevils were caught in the Rolling Plains Central (RPC) zone.

In 2008, the West Texas region had 147,548 cumulative acres treated for boll weevil eradication. A total of 449,770 acres were treated in the region in 2007. In the SRP alone 144,828 cumulative acres were treated in 2008. This was a 63 percent reduction from the 390,093 acres treated in the zone in 2007

South and East Texas Zones

Boll weevil captures in 2008 were reduced in the South and East Texas zones compared with 2007. The number of weevils caught was 25 percent lower than in 2007. The number of treatments in the five South and East Texas zones decreased by 838,258 acres, from 4,706,571 to 3,868,313 acres.

The Northern Blacklands (NBL), Upper Coastal Bend (UCB) and Lower Rio Grande Valley (LRGV) zones attained strong boll weevil populations reductions; 79, 94 and 80 percent, respectively. The number of weevils captured increased in 2008 compared with 2007 in the ST/WG and SBL zones. But, because more traps were inspected in 2008, weevil captures on a weevil per trap inspection basis were unchanged from 2007 in the ST/WG and SBL zones. In the ST/WG 1,501,624 weevils were caught, up from 1,003,173 in 2007 (1.06 weevils per trap inspection in 2007 compared with 1.07 weevils per trap inspection in 2008). In the SBL 142, 918 weevils were caught in 2008 compared with 76,548 in 2007 (0.27 weevils per trap in 2008 versus 0.24 per trap in 2007).

Weevil populations increased in the ST/WG zone primarily because of reproduction in volunteer cotton growing in corn fields (in the Uvalde District) and grain sorghum fields (in the Kingsville and Robstown Districts). Large weevil populations carried over from 2007. They were detected and treated in cotton fields, but detection and treatment was not sufficiently thorough in corn and grain sorghum fields.

Poor stalk destruction, migration and boll weevil detection issues associated with irrigation were the primary concerns in SBL. Hurricanes and associated wet weather negatively affected detection and treatment in all South and East 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. This was attributed to hot, dry, windy weather at the time and pheromone competition from weevils in the field.

State-wide Totals

State-wide, weevil captures were reduced 26 percent. Weevil captures declined from 2,614,868 in 2007 to 1,939,045 in 2008. Cumulative treated acres were down 1.14 million acres (22 percent) from 5,156,341 cumulative acres treated in 2007 to 4,015,861 in 2008.

Table 1. Annual average weevils caught per trap inspection in active boll weevil eradication zones 1999-2008.

Zone	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
TX										
SRP	0.0023	0.00009	0	0.00005	0.00064	0.0013	0.0074	0.00008	0.022	0.0028
RPC	0.14	0.028	0.00053	0.0089	0.0044	0.012	0.0031	0.00005	0.00014	0.0000058
ST/WG	1.53	1.12	0.16	0.144	0.16	0.67	0.21	0.045	1.08	1.07
EP/TP	0.21	0.0093	0.00032	0.00052	0.012	0.00009	0.00029	0	0	0
NRP	18.54	2.34	0.056	0.0019	0.00005	0.00025	0.00015	0.000002	0	0.0000022
NWP	7.23	1.30	0.015	0.0009	0.00001	0	0.000003	0	0	0
PB	9.99	0.42	0.0097	0.028	0.014	0.026	0.017	0.00044	0.00016	0
WHP	18.20	0.68	0.021	0.0026	0.00017	0.00034	0.0004	0.00001	0	0.0000067
NHP			0.89	0.0045	0.00002	0.00002	0.000028	0.000003	0	0
SBL			13.68	1.36	0.356	0.52	0.19	0.099	0.24	0.27
SHP/C			1.16	0.0047	0.00004	0.00013	0.00029	0.00003	0.0000016	0.0000045
UCB				18.22	3.34	1.59	0.29	0.23	0.11	0.0075
PH						0	0	0	0	0

STL						3.23	0.26	0.00625	0.00038	0.000053
NBL							11.47	0.41	0.086	0.014
LRGV							16.12	2.97	2.66	0.85
NM										
C/RNM			1.1	0.0037	0.00004	0	0.00006	0	0	0
CLCNM		1.83*	0.11*	0.029	0.00009	0	0.00035	0	0	0
LCNM		1.83*	0.11*	0.046	0.00019	0.0001	0.00021	0	0	0
PVNM			2.49	0.96	0.05	0.0026	0.00005	0	0	0

* Data not separated between zones

Table 2. Annual average number of ULV malathion applications per acre[1] 1999-2008.

Zone	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
TX										
SRP	0.64	0.01	0	0.087	0.23	0.79	0.91	0.033	1.84	0.69
RPC	3.12	1.52	0.15	0.91	0.89	1.37	0.44	0.025	0.024	0.018
ST/WG	6.24	8.05	4.80	2.92	4.15	5.39	4.02	1.14	3.31	4.32
EP/TP	3.42	0.96	0.14	0.11	0.097	0.02	0.06	0	0	0
NRP	9.21	9.11	2.22	0.53	0.103	0.23	0.09	0.0008	0	0.00049
NWP	5.85	7.36	1.57	0.30	0.013	0	0.002	0	0	0
PB	7.08	3.63	0.52	1.34	3.09	2.37	1.66	0.17	0.017	0
WHP	9.23	6.19	1.41	0.38	0.176	0.35	0.50	0.00035	0	0.00017
NHP			9.59	0.71	0.033	0.06	0.03	0.001	0	0
SBL			7.86	18.58	11.6	11.05	8.39	6.32	6.43	7.07
SHP/C			6.83	1.08	0.087	0.24	0.33	0.0099	0.00017	0.00055
UCB				9.71	16.3	16.79	11.09	13.24	12.01	5.69
PH						0	0	0	0	0
STL						7.02	4.52	0.60	0.22	0.0050
NBL							9.40	9.97	7.89	2.93
LRGV							4.37	4.12	9.47	9.56
NM										
C/RNM			3.00	1.01	0.015	0	0	0	0	0
LCNM		9.3*	6.03*	2.63	0.014	0	0.59	0	0	0
LCNM		9.3*	6.03*	5.16	0.22	0.016	0.24	0	0	0
PVNM			8.64	8.17	7.83	1.46	0.31	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 five 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 eleven West Texas zones are approaching program completion. In addition, strong progress was made in the NBL and UCB zones in 2008. The LRGV zone made good progress in spite of Hurricane Dolly. Program operations in 2009 in the ST/WG and SBL will concentrate on identifying, trapping and treatment of all cotton (including volunteer cotton in other crops and non-crop areas) and working with TDA to achieve early, thorough stalk destruction.

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