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TEXAS BOLL WEEVIL ERADICATION REPORT

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Abstract

The Texas Boll Weevil Eradication Foundation (TBWEF) completed a successful year in 2004 with more than 6.3 million acres in 14 active zones in Texas and just over 44,000 acres in four zones in New Mexico. Support from growers, grower organizations, Texas and federal legislators, USDA and Texas Cooperative Extension, Texas Agricultural Experiment Station and the Texas Department of Agriculture has grown stronger with continued program success. Retention referenda were passed by strong margins in three zones and referenda to start programs in three new zones were passed in 2004. By fall 2004, Texas cotton growers were harvesting an all time record cotton crop.

Introduction

During the twentieth century, boll weevil has been responsible for more dollars in control costs and crop losses than any other cotton pest in Texas. In the US, The National Cotton Council estimates that since the boll weevil entered the US about 1892 it has cost cotton producers more than $13 billion (NCC 1994) (Hunter and Hinds 1905). 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).

Texas cotton growers began participating in boll weevil eradication in 1994 on approximately 220,000 acres in the Southern Rolling Plains (SRP) zone. In 1996 eradication activities began on approximately 500,000 acres of cotton in the South Texas/Winter Garden (ST/WG) zone and about 500,000 acres in the Rolling Plains Central (RPC) zone. In 1997 the program was challenged and halted by the Texas Supreme Court, and a new law was passed that allowed the program to be restarted (El-Lissy, 1998).

Eradication programs were conducted on 1,130,263 acres in three zones, SRP, RPC and ST/WG, in 1998.

In 1999 boll weevil eradication was initiated in five new zones, adding an additional 2.3 million acres to the program. Added were 745,692 acres in the Western High Plains (WHP) zone by a positive vote by 79 percent of qualified voters in Dec. 1998; 445,289 acres in the Northwest Plains (NWP) zone through a positive vote by 75 percent of the voters there; 73,467 acres in the El Paso/Trans Pecos (EP/TP) zone with a positive vote by 80 percent of the growers and land owners; 716,548 acres in the Permian Basin (PB) zone with a positive vote by 73 percent of qualified voters; and 295,682 acres in the Northern Rolling Plains (NRP) zone with a positive vote by 71 percent of the growers and landowners in that zone (El-Lissy 2000, Stavinoha and Woodward 2001). By the fall of 1999, eight zones were involved in active eradication. Full season programs were continuing on 1,299,343 acres in the SRP, ST/WG and RPC zones. The diapause control phase of the program was conducted in the WHP, NWP, EP/TP, PB and NRP zones, representing 2,276,678 acres. Boll weevil was being eradicated on 3,576,021 acres of Texas cotton.

The SRP zone was declared functionally eradicated by Texas Department of Agriculture (TDA) Commissioner Susan Combs on Sept. 20, 2000. Full-season programs were conducted on 4,288,399 cotton acres in 8 active zones in 2000. Referenda held during 2000 added 3 new zones. Growers in the Southern Blacklands (SBL) zone, the Northern High Plains (NHP) zone, and the Southern High Plains/Caprock (SHPC) zone held referenda to assess grower support for the program. Referenda were passed in the NHP by a 75.5 percent positive vote among qualified voters in October 2000 and in the SHPC by 80.4 percent of the voters in November 2000. A referendum supporting starting a program had been previously passed in the SBL in 1999 through a positive vote of 52 percent of the acreage in the zone, but the assessment proposal had failed (Stavinoha and Woodward, 2001). An assessment referendum held in April 2000 passed by 70.8 percent.

In the late summer and fall of 2001, the diapause control phase of the program began in the three new zones. The

program was conducted in the NHP on 558,993 acres, in the SBL on 91,770 acres and in the SHPC on 1,230,590 acres, for a total of 1,881,353 acres in the diapause phase of the program. A total of 4,249,402 acres were in full-season programs in the eight older zones. All together, eleven zones with a total of 6,130,755 cotton acres were involved in eradication programs in the fall of 2001. The ST/WG passed its retention referendum with 87.8% of the voters voting to continue the program in October 2001.

After two years of participation with Texas producers through contracting acres into Texas zones, cotton producers from the Lea County Boll Weevil Control District (LCNM), the Central Lea County Boll Weevil Control District (CLCNM) and the Curry/Roosevelt Counties Boll Weevil Control District (C/RNM) formally associated with the Texas Boll Weevil Eradication Foundation for operations in August, 2001.

On February 19, 2002, Commissioner Susan Combs declared the RPC zone functionally eradicated. A referendum in the Upper Coastal Bend (UCB) zone was held in January 2002. It passed with greater than 55.2 percent of the acreage voting in favor of the program. The program began diapause treatments on the UCB zone's 187,813 acres in early July 2002. The eleven older zones, comprising 5,546,253 cotton acres, were conducting full season eradication programs. In total, boll weevil eradication was conducted on 5,734,066 acres in 2002.

In 2002, retention referenda were passed in four zones. Growers voted in favor of continuing the program in the SRP by 88.2% in February 2002, in the RPC by 89.7% in March 2002, and in the WHP by 86.0% in December 2002. A start-up referendum to conduct boll weevil eradication in the Northern Blacklands (NBL) zone failed with 57.9 % of the vote and 34.7% of the acres voting for a program in December 2002.

TBWEF operations were conducted on 5,735,257 Texas cotton acres in 12 active zones in 2003. In addition, program operations were conducted on 31,006 acres in four active zones in New Mexico.

After three years of program work in the Pecos Valley, the Pecos Valley Boll Weevil Control District (PVNM) began collaborating with the Texas Foundation to conduct program operations in 2003. Retention referenda were passed during 2003 as follows: in the NWP zone by 83.3% in March 2003, in the EP/TP zone by 89% in March 2003, in the PB zone by 85.7% in April 2003, and in the NRP by 90.6% in April 2003. A referendum to attach a portion of northern Glasscock County to the PB zone failed in August 2003 with 63.8% of the growers voting in favor of starting a program, just short of the 66.6% positive vote needed for passage. In December 2003 NBL growers a second time voted on whether to initiate a boll weevil eradication program in their zone. The referendum failed with 64.6% of growers and crop-share land owners and 45.9% of the cotton acres in favor of starting a program.

In 2004, TBWEF conducted boll weevil eradication efforts in 14 active Texas zones involving 6,327,102 cotton acres and 4 active New Mexico zones with 44,080 cotton acres.

In March of 2004, Commissioner Combs declared the NWP, NHP, NRP, SHP/C, WHP, PB and EP/TP zones suppressed. These seven zones joined the SRP and RPC zones with boll weevil populations low enough to qualify for quarantine protection. Taken together, nine west Texas zones with 5,284,663 acres of cotton were declared suppressed or functionally eradicated by the start of the 2004 growing season. By years end 2004 the suppressed and functionally eradicated Texas cotton acreage was joined by 44,081 New Mexico acres operated by TBWEF which were declared suppressed. In the fall two New Mexico zones received suppressed declarations; 12,128 cotton acres in the Lea County zone and the 22,761 cotton acres in the Curry/Roosevelt County zone. The Quay County zone, which was not operated by TBWEF, also received suppressed status declaration in the fall of 2004. In December 2004 the 9,191 acre Lea County Central Zone was declared suppressed.

Operations began in two new Texas zones during 2004, the St. Lawrence (STL) zone and the Panhandle (PH) zone. In early April, a referendum in the 37,611 acre PH zone passed with 92.9% of the growers and 73.9% of the acreage in favor of program initiation. Trapping activities in the PH zone were conducted from pinhead square to hard freeze. No weevils were captured and no treatments were made. Later in April, the 156,093 acre STL zone passed its start-up referendum with 83.4% of the growers and 66.4% of the acres in favor of starting a program. Weekly diapause sprays began in the STL zone in late September and continued through the November.

Retention referenda were held in the NHP and SHP/C zones in 2004. The NHP zone passed its retention vote with 80.6% of growers voting to continue the program in late October. In December, the SHP/C zone also passed its retention vote with 81.0% of growers voting to continue the program. In Mexico, the state of Tamaulipas began boll weevil eradication in 2004. The Lower Rio Grande Valley (LRGV) held a program referendum in November 2004. It passed with 73.8% of the growers and landowners voting in favor of the program and 59.4% of the cotton acreage registering a positive vote. There is little doubt that the presence of a program in adjacent cotton in Mexico was a positive factor in the LRGV vote.

In January 2005 the Northern Blacklands (NBL) zone will conduct its third program referendum to determine whether or not a program will be conducted there. If the referendum passes, the diapause phase of the eradication program will begin in the NBL zone in late summer 2005. The NBL zone is the last zone in Texas and the last cotton growing zone in the United States which has not entered a boll weevil eradication program.

Methods

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

Discussion

Texas and eastern New Mexico experienced a very wet growing season in 2005. The rainy weather provided growers with an opportunity to produce a record breaking cotton crop, but it made boll weevil eradication program efforts difficult. Roads and fields were muddy and traps could not be read on schedule. This affected the ability of program personnel to accurately target fields for treatment. Malathion residues on cotton plants were washed off by the rain. These conditions were especially troublesome in the SBL, UCB and ST/WG zones. Good growing conditions for cotton were also beneficial for boll weevils. Areas not in eradication; the LRGV, STL and NBL zones; produced large numbers of weevils which moved into eradication zones. Within active eradication zones, the effects of weather on trapping and treatment effectiveness allowed weevils to become established and to reproduce early and mid-season. Predictably, these factors resulted in larger than expected numbers of boll weevils and more treatments were required than expected in the zones most affected by the migration and early season rainfall.

Texas High Plains Zones

A preliminary trapping program was conducted in the 13 counties in the northern part of the Texas Panhandle in 2003. No weevils were caught. PH growers passed the referendum initiating the program in early April 2004. Traps were deployed on the 37,611 acres at a density of about 1 trap per 18 acres. Cotton plantings were primarily in two areas, near the towns of Panhandle and White Deer in Carson County and near the town of Dumas in Moore and Hartley Counties. Traps were inspected from the week beginning July 5 through the week beginning November 8. Total trap inspections for the zone were 35,949 for the year. No boll weevils were trapped.

The eradication program began in the NWP zone (Hereford, Muleshoe, Littlefield, Dimmitt area) in 1999. The NWP zone had 535,038 cotton acres in 2004, more than any year since 2000. More than 22,000 traps were deployed, a trap density of about 1 trap per 20 acres. No boll weevils were caught in 433,955 trap inspections in the zone. No acres were treated in the NWP zone.

The NHP zone (Tulia, Plainview, Floydada area) began eradication in 2001. The zone had 590,215 cotton acres in 2004, the highest since the program began. More than 27,400 traps were deployed, an average of 21.5 acres per trap. Six hundred thirteen thousand six hundred and twenty-two traps were inspected for the year. Thirteen weevils were caught during the year, primarily late season near roads and on the southeast side of the zone near the caprock. For the year, 0.000021 weevils were caught per trap inspection. Weevil captures triggered treatment of 35,872 acres, 6% of the cotton acreage in the zone.

The SHP/C zone (Morton, Levelland, Lubbock, Tahoka, Crosbyton area) began eradication activities in 2001. The zone had 1,231,654 cotton acres in 2004. This was the largest planting since the eradication program started. Over

49,600 traps were deployed, about one trap per 24.8 cotton acres. One million one hundred and ninety one thousand two hundred and seventy-seven traps were inspected and 157 weevils were caught, most of them in the southern and eastern areas of the zone near the caprock. A few were caught near major roads. At year's end, 0.00013 weevils were caught per trap inspection. Two hundred ninety one thousand eight hundred and seventy-three acres were treated, or 24% of the acreage in the zone.

The WHP zone (Brownfield, Plains, Seagraves, Seminole area) began eradication in 1999. The zone had 887,754 cotton acres in 2004 the largest cotton planting since 2000. More than 37,700 traps were deployed in the zone, an average of about one trap per 23.5 acres. A total of 836,631 trap inspections were made and 282 boll weevils were caught, 0.0003 weevils per trap inspection. Most were caught late season on the southeastern side of the zone in Andrews and Gaines Counties and near the caprock in Lynn County on the eastern side of the zone. Three hundred and ten thousand three hundred and seventy-nine acres were treated, 35% of the cotton acreage in the zone.

The PB zone (Lamesa, Big Springs, Stanton, Midland area) began eradication in 1999. There were 774,525 cotton acres in the zone in 2004, the largest planting since 2001. The zone had just over 75,000 traps deployed, an average of about one trap per 10.3 acres. One million five hundred and seventy six thousand forty-five traps were inspected by the end of the year and 40,869 weevils were caught, 0.0259 weevils per trap inspection. Eighty one percent of the weevils caught in the zone were caught in the Big Spring district, 17% in the Stanton district and about 2% in the Lamesa district. A very high percentage of the weevils caught in the PB zone were caught along and south of Interstate 20, within a short distance of the boundary with the STL zone. The STL zone entered the program with diapause phase treatments in 2004. A total of 1,839,390 acres were treated, 2.37 applications per acre in the zone. Very few instances of boll weevil reproduction were observed in PB fields.

The 156,093 acre STL zone (cotton acreage around Garden City) began eradication in 2004. After passing their referendum in late April, limited spring treatments were applied to irrigated acreage in Northern Glasscock County during the two week period from June 21 through July 4. During this time a cumulative 8,225 acres were treated. One trap was deployed on each field, about 1,000 in the zone, providing a trap density of one trap per 156 acres. At year's end 32,055 weevils had been captured in 9,914 trap inspections, an average of 3.23 weevils per trap inspection. The highest weevil captures were in Northern Glasscock County which had an average of 10.4 weevils per trap inspection and the central part of the zone, around St. Lawrence which had an average of 4.38 weevils per trap inspection. The Reagan County area to the south had and average of 0.42 weevils per trap inspection and the Midkiff area to the west had an average of 0.24 weevils per trap inspection. Diapause treatments began late August with all fields having cracked bolls treated by the last week in September. All hostable fields were treated through the week ending December 5. A total of 1,096,324 cumulative acres were treated, a total of 7.02 acre treatments

New Mexico and Far West Texas Zones

Program activities in Curry and Roosevelt Co.s of New Mexico began through growers contracting with the NWP zone in 1999. Formal entry into a program conducted by TBWEF occurred in 2001. In 2005 growers in the Curry/Roosevelt zone planted 22,891 acres of cotton. About 1,230 traps were deployed, a trap density of one trap to 18.6 acres. A total of 20,702 traps were inspected and no boll weevils were caught. No acres were treated.

Program activities in Lea County New Mexico began through some growers contracting with the WHP zone in 1999. Formal entry into a program conducted by TBWEF occurred in 2001. In 2004 the Lea County zone (LCNM) had 12,061 cotton acres. About 950 traps were deployed in the zone, a trap density of one trap to 12.7 acres. A total of 18,980 traps were inspected with only two weevils captured. Both weevils were caught in the same area. The first weevil was caught the week of October 25-31 and the second was caught the week of November 8-14. At year's end weevils per trap inspection was 0.000053. One hundred ninety-eight acres were treated for the year, 1.6% of the acres in the zone.

Growers in the Central Lea County (CLCNM) zone began eradication activities by requesting the assistance of TBWEF for program operations in 2001. In 2004 CLCNM growers planted 9,190 acres of cotton. About 900 traps were deployed, one trap per 10.2 acres. At the end of the year, 16,241 traps had been inspected and no boll weevils had been caught. No acres were treated.

Boll weevil eradication began in the PVNM zone (Carlsbad, Artesia, Roswell area) in 2000 with program operations

conducted by the Pecos Valley Boll Weevil Control District. In 2003 the Pecos Valley Boll Weevil Control Board requested assistance from TBWEF in conducting program operations. Pecos Valley growers planted 10,006 acres of cotton in 2004 up from 8,146 acres in 2003. About 3,550 traps were deployed, one trap to 2.8 acres. By the end of the year, 71,991 traps had been inspected. The first captures occurred the week beginning May 31. By August 1, 36 weevils had been captured. Of these 10 were caught north of Artesia and 26 weevils were caught south of Artesia. By mid-November the last weevils were captured. These brought the total for the year to 186, 0.0026 weevils per trap inspection. Twelve weevils had been caught north of Artesia while 174 had been caught south of Artesia. Fourteen thousand six hundred and thirty-three acres were treated, 1.5 treatments per acre in the zone.

Eradication activities began in the EP/TP zone (El Paso, Pecos, Presidio area) in 1999. EP/TP growers planted 42,134 acres of cotton in 2004, the largest plantings since 2001. About 3,610 traps were deployed on these acres, a trap density of one trap per 11.7 cotton acres. The year-long total of traps inspected was 95,682 and nine boll weevils were captured. All nine weevils were caught at the same location just west of Pecos near Interstate 20. The first weevil was caught the week beginning October 4 and for the next three weeks two to three weevils were caught there each week. A cumulative total of 892 acres were treated in the EP/TP zone, 0.02 treatments per acre in the zone.

Texas Rolling Plains Zones

The NRP zone (Clarendon, Childress, Paducah, Vernon area) began eradication in 1999. In 2004 NRP growers planted 414,503 acres of cotton. About 30,000 traps were deployed on cotton fields in the zone, one trap per 13.8 acres. By year's end, 632,674 traps had been inspected and 157 weevils had been caught, 0.00025 weevils per trap inspection. The first boll weevil was caught in the Jayton district on the southwest side of the zone the week of May 10. No weevils were caught from the week beginning May 10 until the week ending September 6. One hundred and thirteen weevils were caught in the zone between October 11 and November 14. Ninety-three weevils were caught in the Jayton district, 32 in the Vernon district, 14 in the Paducah district, two in the Wellington district and one each in the Memphis and Turkey districts. The timing and location of the Jayton weevils was consistent with captures in neighboring zones associated with migration out of the STL zone. Many of the other weevils were caught from fields near highways. Cumulatively, 97,547 acres were treated, 23% of the acreage in the zone.

The RPC zone (Snyder, Colorado City, Abilene, Stamford, Munday area) began eradication in 1996. RPC growers planted 575,974 acres of cotton in 2004, the largest acreage since 2001. About 60,000 traps were deployed in the RPC zone. This was a trap density of one trap per 9.6 acres. A cumulative total of 1,173,106 traps were inspected and 13,821 weevils were caught. Ninety-eight percent of the weevils trapped in the RPC were caught on the west side of the zone in the Colorado City and Snyder districts. These weevils were caught in locations and timing consistent with migration from the STL zone. Lower numbers of weevils were caught on the east side of the zone. The timing and locations of these catches was consistent with migration from the NBL zone. Other districts in the zone caught weevils late in the year. Many of these were caught in fields bordering highways and may have been moved into the zone on harvesting equipment. A cumulative total of 794,825 acres were treated in the RPC zone, 1.37 treatments per acre in the zone.

The SRP zone (San Angelo, Ballinger area) has been in active eradication since 1994. In 2003 the zone had 236,961 acres, the most cotton acres since 2001. About 13,500 traps were deployed in the SRP, a density of one trap per 17.5 acres. A total of 271,878 traps were inspected with 354 weevils trapped, 0.0013 weevils per trap inspection. Sixty-four percent of the weevils caught were caught on the west side of the zone. Weevils were also trapped on the east side of the zone in a similar pattern to those caught on the east side of the RPC zone. These weevils were consistent in timing and location with migration from the NBL zone. Other weevils were caught near where equipment or gin trash was moved into the zone from infested areas. A cumulative total of 187,624 acres were treated, 79% of the acreage in the zone

Texas Blacklands Zones

The NBL is voting on an eradication program in January 2005. If the referendum passes, the program will start with diapause treatments at first cracked boll in 2005.

The SBL zone (Taylor, Bryan, Temple area) began eradication in 2001. SBL growers planted 115,004 acres of cotton in 2004, the largest cotton acreage since the program began. The zone had about 30,600 traps deployed during the

season and inspected at total of 592,933 traps for the year. Three hundred eight thousand nine hundred and forty-three weevils were caught, 0.52 weevils per trap inspection. Weevil captures were higher in the Marlin district with 0.92 weevils per trap than in the Thorndale district which had 0.51 weevils per trap or the Bryan district which had 0.24 weevils per trap. Marlin's capture data was affected by weevils moving into the zone from the NBL zone. The entire SBL zone was affected by long periods of rainy weather which prevented thorough timely trapping and shortened the residual life of insecticide treatments. Cumulatively, 1,271,102 acres were treated, eleven applications per acre in the zone.

South Texas Zones

Eradication began in the UCB zone (Rosenburg, Wharton, Bay City, El Campo area) in 2002. In 2004 207,202 acres were planted to cotton in the zone. This was the largest cotton planting since the zone began operations. About 52,000 traps were deployed in the zone, one trap per four acres, and a total of 1,297,599 trap inspections were conducted. Two million seventy four thousand and sixty-nine weevils were caught, 1.59 per trap inspection. Cumulatively 3,479,558 acres were treated, 16.8 treatments per acre in the zone. Wet weather strongly hampered operations in the UCB zone.

The ST/WG zone (Kingsville, Corpus Cristi, Victoria, Uvalde area) began eradication activities in 1996. Cotton growers in the zone planted 526,528 acres of cotton in 2004, the largest crop since the program began. Approximately 99,500 traps were deployed in the zone for a trap density of one trap per 5.3 acres. Cumulatively, 1,911,773 traps were inspected in 2004 and 1,287,408 weevils were caught, 0.67 weevils per trap inspection. Ninety-one percent of the weevils caught in the zone were caught from the Uvalde and Kingsville districts, which make up only 14% of the cotton acres in the zone. These districts are the southern districts in the zone and are most subject to migration from the LRGV. The total acreage treated in the zone was 2,838,718 acres, 5.4 applications per acre in the zone. Like the UCB and SBL zones, the ST/WG zone had excessively rainy weather that impeded program activities.

Summary

The Texas Boll Weevil Eradication Program had mixed results in 2004. Two Texas and two New Mexico zones caught no weevils during the year. Weevil populations continued to be pushed lower in some areas, while migration and weather problems contributed to slight weevil population increases in others. Seven zones encompassing 4.5 million acres were declared suppressed and began to receive protection against boll weevil re-introduction in 2004. This brought the total acres in suppressed and functionally eradicated zones to 5.3 million acres. Three new zones voted to enter an eradication program. These positive referenda left the NBL zone as the only zone in the U.S. not in eradication. Retention referenda passed by over 80% in two zones, the NHP and SHP/C zones.

Migration of boll weevils from zones not in eradication and extended periods of wet weather worked against the achievement of strong reductions in boll weevil populations in 2004. The wet weather was a larger concern in the southern and eastern zones because it occurred in the spring in these zones and weevils became established in some fields. In spite of these problems, weevil populations were kept under control at low levels. Growers were able to take advantage of good soil moisture and growing conditions and very low boll weevil populations to produce a record breaking cotton crop.

The time and energy invested by growers and Foundation staff is paying off with new zone passage solid program staffing and performance. The program is in a position to move forward strongly in 2005.

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

Zone	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Texas										
SRP	7.87	2.03	1.52	0.04	0.0023	0.00009	0	0.00005	0.00064	0.0013
RPC		16.99	11.52	0.69	0.14	0.028	0.00053	0.0089	0.0044	0.012
ST/WG		12.82	16.09	2.13	1.53	1.12	0.156	0.144	0.158	0.67
EP/TP					0.21	0.0093	0.00032	0.00052	0.012	0.00009
NRP					18.54	2.34	0.056	0.0019	0.00005	0.00025
NWP					7.23	1.30	0.015	0.0009	0.00001	0
PB					9.99	0.42	0.0097	0.028	0.0142	0.026
WHP					18.20	0.68	0.021	0.0026	0.00017	0.00034
NHP							0.89	0.0045	0.00002	0.00002
SBL							13.68	1.36	0.356	0.52
SHP/C							1.16	0.0047	0.00004	0.00013
UCB								18.22	3.34	1.59
PH										0
STL										3.23
New Mexico										
C/RNM							1.1	0.0037	0.00004	0
CLCNM						1.83*	0.11*	0.029	0.00009	0
LCNM						1.83*	0.11*	0.046	0.00019	0.00019
PVNM							2.49	0.96	0.05	0.0026

* Data not separated between zones

Table 2. Annual average number of ULV malathion applications per acre.

Zone	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Texas										
SRP	8.90	4.55	7.60	1.42	0.64	0.01	0	0.087	0.23	0.79
RPC		5.42	6.89	1.62	3.12	1.52	0.15	0.91	0.89	1.37
ST/WG		4.93	4.62	5.57	6.24	8.05	4.80	2.92	4.15	5.39
EP/TP					3.42	0.96	0.14	0.11	0.097	0.02
NRP					9.21	9.11	2.22	0.53	0.103	0.23
NWP					5.85	7.36	1.57	0.30	0.013	0

PB	7.08	3.63	0.52	1.34	3.09	2.37
WHP	9.23	6.19	1.41	0.38	0.176	0.35
NHP			9.59	0.71	0.033	0.06
SBL			7.86	18.58	11.6	11.05
SHP/C			6.83	1.08	0.087	0.24
UCB				9.71	16.3	16.79
PH						0
STL						7.02
New Mexico						
C/RNM			3.00	1.01	0.015	0
CLCNM		9.3*	6.03*	2.63	0.014	0
LCNM		9.3*	6.03*	5.16	0.22	0.016
PVNM			8.64	8.17	7.83	1.46

* Data not separated between zones

Figure 1. Boll weevil eradication zones operated by TBWEF.