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BOLL WEEVIL ERADICATION UPDATE – ARKANSAS, 2004

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Abstract

The Arkansas Boll Weevil Eradication Program (ABWEP) was initiated in 1997 to rid the state of the boll weevil *Anthonomus grandis* Boheman.

The Arkansas program began in the Southwest zone in 1997 with the diapause phase, followed by season-long phases in 1998, 1999, 2000, 2001, and season-long maintenance phases in 2002, 2003, and 2004. The seasonal mean number of boll weevils captured per trap per week in 2004 was significantly less than in 1998. The mean in 2004 was 0.00 weevils per trap per week, and in 1998 it was 3.99, a reduction rate of 100%. Insecticide applications in 2004 for boll weevils were reduced by 100.0%, compared to 1998.

The program expanded into the Southeast zone in 1999 with the diapause phase, followed by season-long phases in 2000, 2001, 2002, 2003 and season-long maintenance phases in 2004. The seasonal mean number of boll weevils captured per trap per week in 2004 was significantly less than in 2000. The mean in 2004 was 0.0031, and in 2000 it was 5.54, a reduction rate of 99.94%. Insecticide applications made by the program in 2004 were less than in 2000 by 89.5%.

The program expanded into the Central zone in 2000 with the diapause phase of the program followed by a season-long phase in 2001, 2002, 2003 and 2004. The seasonal mean number of boll weevils captured per trap per week in 2004 was significantly less than in 2000. The mean in 2004 was 0.013, and in 2000 it was 15.66, a reduction rate of 99.91% in 2004 when compared with 2000. Insecticide applications made by the program in 2004 were less than in 2000 by 60.6%.

The program expanded into the Northeast Ridge zone in 2001 with the diapause phase, followed by a season-long phase in 2002, 2003 and 2004. The seasonal mean number of boll weevils captured per trap per week in 2004 was significantly less than in 2001. The mean in 2004 was 0.058, and was 8.70 in 2001, a reduction rate of 99.33%. Insecticide applications made by the program in 2004 were less than in 2002 by 34.9%.

The program expanded in the Northeast Ridge Zone to include Eastern Poinsett in 2002 with the diapause phase, followed by a season-long phase in 2003 and 2004. The seasonal mean number of boll weevils captured per trap per week in 2004 was reduced when compared to the trapping program in 2001. The mean in 2004 was 0.163, and was 11.79 in 2001, a reduction of 98.6%.

The program expanded into the Northeast Delta Zone in 2003 with the diapause phase, with the season-long phase in 2004. The seasonal mean number of boll weevils captured per trap per week in 2004 was significantly less than in 2003. The season mean number of boll weevils captured per trap per week in 2004 was 1.588, and was 9.576 in 2003 a reduction of 83.4%.

The overall percent boll weevil damaged squares and bolls during the month of September were significantly lower in zones that have been through multiple full-season phases of the program as compared with zone in the first full-season phase. The percent damage in the Southwest Zone was 0.00%, in the Southeast Zone it was 0.00%, in the Central Zone it was 0.002%, in the Northeast Ridge Zone it was 0.00%, while in the non-active eradication zones it was 0.86%. In 2002 prior to the initiation of eradication activities within the Northeast Delta Zone the percent damage was 59.6.

The results of the ABWEP, demonstrated to this point, indicate significant progress made toward eradication, especially when proven operational principles are effectively implemented. The use of pheromone baited traps for detection, along with sound cultural, mechanical and chemical control methods simultaneously implemented within a harmonized system is proving successful in eradicating the boll weevil.

Introduction

The plan to eliminate the boll weevil, *Anthonomus grandis* Boheman, a native of Mexico and Central America, from the United States continues to expand into the remaining regions of the cotton belt where active eradication programs have not been implemented. This is certainly true in the state of Arkansas. Expansion of the eradication effort into Eastern Poinsett in 2002 and into Eastern Craighead and Mississippi counties in 2003 brought all cotton acreages located in the State of Arkansas and the entire Southeastern portion of the cotton belt into active eradication. This is critical to the success of the Arkansas eradication effort as well as to adjoining states, which have been effected by migrating boll weevil populations. The history of the boll weevil eradication program in Arkansas was previously described (Kiser, et al. 2001).

The Southwest Zone program was initiated with the diapause phase in 1997 with operations under the direction of the Louisiana Boll Weevil Eradication Program. The Arkansas Boll Weevil Eradication Foundation (ABWEF) assumed program operations starting with the third season-long phase of the program in 2000, and continued during the fourth season-long phase in 2001, the first season-long maintenance phase in 2002, the second season-long maintenance phase in 2003 and the third season-long maintenance phase in 2004. Program operations were initiated in the Southeast Zone with the diapause phase in August 1999. The first season-long phase of the program began in the spring of 2000, and was followed by a second season-long phase in 2001, and the third season-long phase in 2002, the forth season-long phase in 2003 and the first season-long maintenance phase in 2004. Program operations were also implemented with the diapause phase in the Central Zone in August 2000, and were followed by the first season-long phase in 2001, and the second season-long phase in 2002, the third season-long phase in 2003 and forth season-long phase in 2004. The Northeast Ridge Zone began the program operations with the diapause phase in 2001. The first season-long phase of the program began in the spring of 2002, the second season-long phase in 2003 and third season-long phase in 2004. Following an unsuccessful referendum held in November of 2001, a referendum with a modified assessment was held on February 27, 2002, to begin a fall diapause program in 2002 in the Northeast Delta Zone. This vote also failed with 628 votes for the program and 414 opposed. While the majority of the growers and landlords voting wanted the program, Arkansas law requires that 2/3 of the growers and landlords voting endorse the program. The Arkansas Boll Weevil Eradication Board of Directors approved and held a new referendum with a modified assessment on December 14, 2002. The votes were counted on December 23, 2002, and this vote also failed with 575 votes for the program and 309 opposed. The Arkansas Boll Weevil Eradication Board of Directors approved another referendum from January 27, 2003 through February 7, 2003. Votes were counted on February 13, 2003, this vote also failed with 704 votes for the program and 601 apposed. Following this referendum failure the Arkansas State Plant Board exercised its authority under the 1917 Plant Act and the 1991 Boll Weevil Act to eradicate the boll weevil in the Northeast Delta Zone. The Arkansas State Plant Board entered into an agreement with the Arkansas Boll Weevil Eradication Foundation to carry out the eradication program in the Northeast Delta Zone. Program operations were implemented with the diapause phase in the Northeast Delta Zone in August 2003. The first season-long phase of the program began in the spring of 2004. With the initiation of the Northeast Delta Zone the entire state of Arkansas is currently under eradication.

Methods and Materials

Five Eradication Zones were established through legislative action, grower referenda and the Arkansas State Plant Board. These zones, including 2004 cotton crop acreage, are as follows (Figure 1):

1.	Southwest	3,873 acres
2.	Southeast	276,561 acres
3.	Central	211,422 acres
4.	Northeast Ridge	133,594 acres
5.	Northeast Delta	292,747 acres

Mapping

In active eradication zones, all cotton fields were located, identified and accurately mapped for successful implementation of eradication programs. Geo-Explorer global positioning system (GPS) hand held units along with post processing deferential correction, using Pathfinder software, were utilized in identifying the exact location of

each field (within a sub-meter of accuracy). Maps were created for each field by using geographic data in a geographic-database (MapInfo). Each field is assigned a unique nine-digit number as previously reported (El-Lissy et al, 1996). In addition to the advantages discussed in the previously noted publication, determining the exact location of each field and using the unique identifying numbers makes it possible to ensure high quality of aerial, ground and mistblower applications by overlaying GPS treatment data on field maps. It also allows for detailed spatial analysis of trapping data.

Detection

1. Trapping:
    a. Boll weevil pheromone traps (Plato Industries, Inc., Houston, Texas) (Plato et al, 2001) were placed around the perimeter of all fields located in season-long active phase zones shortly after planting at a space of approximately 300 feet (Boyd et al, 2000). In areas of the Southwest Zone, Southeast Zone and Central Zone where 2003 fall weevil captures were less than .01 boll weevils per trap spacing was 900 feet around the perimeter of the field. Fields adjacent to other states were trapped at approximately 300 feet. In the Southwest Zone traps were baited with 25 mg of grandlure impregnated onto polyvinyl chloride one-inch square laminated dispenser (Plato Industries, Inc., Houston, Texas) and were checked and grandlure dispensers changed every three weeks. In the Southeast Zone, Central Zone, Northeast Ridge Zone and Northeast Delta Zone traps were baited with 10 mg of grandlure impregnated onto polyvinyl chloride one-inch square laminated dispensers (Plato Industries, Inc., Houston, Texas). Grandlure dispensers were replaced weekly, leaving the dispenser from the previous cycle in addition to the new dispenser. Therefore, each dispenser was left in the trap for a total of two weeks. Every fourth week one-inch by half-inch laminated polyvinyl chloride dispensers impregnated with 0.6 gm of dichlorvos (Plato Industries, Inc., Houston, Texas), were placed in each trap to kill weevils as they entered traps.
    b. Trap lines were deployed in April 2004 along north south highways linking the Southeast, Central, Northeast Ridge and Northeast Delta. Trap lines were also deployed along east west highways through the Northeast Ridge Zone and Northeast Delta Zone. Trap line information was gathered to evaluate differences in weevil catches in active eradication zones. Traps were placed every mile along selected hi-ways. Traps were inspected weekly throughout the 2004 season. Grandlure dispensers and insecticide kill strips were used as described above (Figure 2).
2. Field Survey: The purpose of the survey was to access the level of boll weevil damage inside active eradication zones. The eradication zones included in the survey were the Southwest Zone, Southeast Zone, Central Zone, Northeast Ridge Zone and Northeast Delta. Ten randomly selected fields from each county located in the above zones were surveyed. One hundred hostable (squares, blooms and/or green bolls) cotton fruit were randomly collected while scouts walked along a circular pattern extending into a large portion of each field. This survey was conducted the first week of September 2004. All collected cotton fruit was examined for evidence of boll weevil damage and the percent damage for each field was calculated. The overall percent of boll weevil damage was then calculated for each county and zone.

Control

The control component of the ABWEP is comprised of cultural, mechanical and chemical control:

1. Cultural Control: timely cotton planting, defoliation, harvesting and crop destruction, as recommended by Arkansas Agricultural Extension Service, are essential in providing a necessary boll weevil host-free period. Another important cultural practice is maintaining well-drained, accessible turn-rows, which allow for timely inspections of boll weevil traps and mistblower treatments.

2. Mechanical Control: while detection remains the principal function of the boll weevil trap, a certain percentage of the boll weevil population is also removed in the process. As boll weevil populations are reduced in the field, the percentage of the boll weevils that are removed by traps increases (Lloyd et al, 1972). Traps become especially important as a control mechanism in the final phase of eradication.

3. Chemical Control: Malathion ultra-low-volume (ULV) was applied by air and ground equipment. Airplanes and helicopters were equipped with differentially corrected GPS data recording systems and spray systems calibrated for ULV applications following USDA-APHIS-PPQ guidelines. High-clearance

ground sprayers and trucks were equipped with Big John Mistblower units. All ground spray systems were equipped and calibrated to apply ULV Malathion (16.0 fl oz/ac, 1.23 lb [AI]/ac).

a. Season-long phase:
   1) Southwest Zone: In 2004, ABWEP personnel implemented the third season-long maintenance phase of the program. Beginning at pinhead square, fields reaching treatment criteria (action threshold), received a single application of Fyfanon® ULV (12.0 fl oz/ac, 0.92 lb [AI]/ac). Season-long treatments were based on an action threshold of one weevil trapped per field or if a boll weevil infestation was evident. When fields triggered according to the above criteria all surrounding fields were also treated.
   2) Southeast Zone: in the spring of 2004 ABWEP personnel began the first season-long maintenance phase of the program. Beginning at pinhead square, fields reaching treatment criteria (action threshold), received a single application of Fyfanon® ULV or Atrapa® ULV (10.0 fl oz/ac, 0.77 lb [AI]/ac). Season-long treatments were based on an action threshold of one weevil trapped per field or if a boll weevil infestation was evident. When fields triggered according to the above criteria all surrounding fields were also treated.
   3) Central Zone: in the spring of 2004 ABWEP personnel began the forth season-long phase of the program. Beginning at pinhead square, fields reaching treatment criteria (action threshold), received a single application of Fyfanon® ULV or Atrapa® ULV (10.0 fl oz/ac, 0.77 lb [AI]/ac). Season-long treatments were based on an action threshold of one weevil trapped per field or if a boll weevil infestation was evident. When fields triggered according to the above criteria adjacent fields were also treated.
   4) Northeast Ridge Zone: in the spring of 2004 ABWEP personnel began the third season-long phase of the program. Beginning at pinhead square, fields reaching treatment criteria (action threshold), received a single application of Fyfanon® ULV or Atrapa® ULV (10.0 fl oz/ac, 0.77 lb [AI]/ac). Season-long treatments were based on an action threshold of one weevil trapped per field or if a boll weevil infestation was evident. When fields triggered according to the above criteria adjacent fields were also treated.
   5) Northeast Ridge Zone (Eastern Poinsett): in the spring of 2004 ABWEP personnel began the second season-long phase of the program. Beginning at pinhead square, fields reaching treatment criteria (action threshold), received a single application of Fyfanon® ULV or Atrapa® ULV (10.0 fl oz/ac, 0.77 lb [AI]/ac). Season-long treatments were based on an action threshold of one weevil trapped per field or if a boll weevil infestation was evident. When fields triggered according to the above criteria adjacent fields were also treated.
   6) Northeast Delta Zone: in the spring of 2004 ABWEP personnel began the first season-long phase of the program. Beginning at pinhead square, fields reaching treatment criteria (action threshold), received a single application of Fyfanon® ULV or Atrapa® ULV (10.0 fl oz/ac, 0.77 lb [AI]/ac). Season-long treatments were based on an action threshold of two weevil trapped per field or if a boll weevil infestation was evident. When fields triggered according to the above criteria adjacent fields were also treated.

Results and Discussion

Trap captures from zone trapping programs (Figure 16), trap lines (Figure 7), boll weevil damage surveys (Figure 5), and field observations indicate reductions in boll weevil populations in all active zones.

Southwest Zone

The Southwest Zone is exhibiting significantly reduced weevil populations, and economic damage caused by boll weevils was not noticed in any fields during the 2004 season.

The 2004 season-long mean number of adult weevils captured per trap per week was significantly less than in the 1998 season. The mean number for 2004 was 0.0000, in 2003 was 0.00013, in 2002 was 0.00196, in 2001 was 0.065, in 2000 it was 0.66, in 1999 it was 0.68, and in 1998 it was 3.96, a reduction rate of 100% in 2004 as compared to 1998 (Figure 3). Accurate comparisons of trap captures between the 1997 diapause phase and 2004 season are unavailable due to very limited trapping information for the 1997 season.

The season-long average number of program applications in 2004 was 0.00, in 2003 was 0.00, in 2002 it was 3.07, in 2001 it was 12.52, in 2000 it was 4.57 applications per acre, in 1999 it was 12.03, and in 1998 it was 16.73, a reduction of 100% in 2004 compared to 1998 (Figure 4). Information regarding the applications per acre in 1997 was unavailable. The increase in number of applications from 2000 to 2001 is attributed to methods of treatments applied during the 2000 season. For more detailed analysis of treatments during past seasons see Kiser, et al, 2001and 2002.

As indicated by the boll weevil damage survey conducted the first week of September 2004, percent boll weevil damaged cotton fruit was significantly less in counties located within the Southwest Zone compared to levels in counties involved in the first full season phase of the program. The percentage of hostable cotton fruit damaged by boll weevils within the collected samples from counties located in the Southwest Zone was 0.0 % compared to 0.86% damage calculated for the cotton growing counties in the first season-long phase of the program (Figure 5).

Southeast Zone

In the Southeast Zone, boll weevil trap captures were reduced following the fall diapause phase of the program in 1999, and the season-long phases in 2000, 2001, 2002, 2003 and 2004. The 2004 season-long overall mean number of adult boll weevils captured per trap per week was significantly less than 2000. The mean number for 2004 was .0031, and in 2000 it was 5.54, a reduction of 99.94% in 2004 as compared to 2000 (Figure 6). Accurate comparisons of trap captures between the 1999 diapause phase and 2003 season are unavailable due to very limited trapping information for the 1999 season. Historically, fall boll weevil trap captures in the Southeast Zone have been very high, averaging over 100 boll weevils per trap per week in certain counties (Donald R. Johnson, personal communication).

As indicated by a boll weevil damage survey conducted the first week of September 2004, percent boll weevil damaged cotton fruit was significantly less in counties located within the Southeast Zone compared to levels in counties in the diapause phase of eradication. The percentage of hostable cotton fruit damaged by boll weevils in counties located in the Southeast Zone was 0.00 % compared to 0.86% damage calculated for the cotton growing counties in the first season-long phase of the program (Figure 5).

Trap line data also indicated reductions in boll weevil trap catches in the Southeast Zone when compared to the trap line captures from the Northeast Delta Zone. The overall season-long mean number of adult weevils captured in the Southeast Zone trap line per trap per week for the 2004 growing season was 0.000397 (Figure 7).

The overall mean number of treatments during the diapause phase of 1999 was 5.43 applications per acre. The season-long average number of program applications in 2004 was 1.27, in 2003 it was 4.18, in 2002 it was 7.19, in 2001 it was 9.30 and in 2000 it was 12.11, a reduction of 89.5 % in 2004 compared to 2000 (Figure 8).

Central Zone

In the Central Zone, boll weevil trap captures have been reduced following the fall diapause phase of the program in 2000, and the season-long phases in 2001, 2002, 2003 and 2004. The 2004 season-long overall mean number of adult boll weevils captured per trap per week was significantly less than in the 2000 season. The mean number for 2004 was 0.014, in 2003 was .028, in 2002 it was 0.32, in 2001 it was 0.41, and in 2000 it was 15.66, a reduction of 99.91% in 2004 as compared to 2000 (Figure 9). Due to boll weevil migration from the Northeast Delta Zone (currently finishing the first full season-long phase of eradication) weevil numbers were reduced at decreased rates in areas adjacent to the Delta Zone when compared with other areas of the Central Zone.

As indicated by a boll weevil damage survey conducted the first week of September 2004, percent boll weevil damaged cotton fruit was significantly less in counties located within the Central Zone compared to levels in counties in the diapause phase of eradication. The percentage of hostable cotton fruit damaged by boll weevils in counties located in the Central Zone was 0.002%, which represents a significant difference when compared to 0.86% damage calculated for the cotton growing counties in the first season-long phase of the program (Figure 5).

Trap line data also indicated differences between boll weevil trap catches in the Central Zone when compared to the trap line captures from the Northeast Delta Zone. The overall season-long mean number of adult weevils captured in the Central Zone trap line per trap per week for the 2004 growing season was 0.145 (Figure 7).

The overall mean number of treatments during the diapause phase of 2000 was 6.55 applications per acre. The season-long mean number of treatments in 2004 was 1,27, in 2003 it was 8.77, in 2002 it was 10.88 and in 2001 it was 12.80 applications per acre (Figure 10). Treatments were reduced by 88.4% when applications made in 2004 were compared with 2001. 2004 treatments adjacent to the Northeast Delta Zone southern border were increased when compared with other areas of the Central Zone.

Northeast Ridge Zone

In the Northeast Ridge Zone, boll weevil trap captures have been reduced following the fall diapause phase of the program in 2001, and the season-long phases in 2002, 2003 and 2004. The 2004 season-long overall mean number of adult boll weevils captured per trap per week was significantly less than in the 2001 season. The mean number for 2004 was 0.058 and in 2001 it was 8.70, a reduction of 99.33% in 2004 as compared to 2001 (Figure 11). These reductions in the Northeast Ridge Zone were moderated by boll weevil's migrating from the Northeast Delta Zone from mid-August till the end of the 2004 season.

Trapping information for the Eastern Poinsett portion of the Northeast Ridge was kept separate due to the different phases of the program in each area. In Eastern Poinsett (added to the Northeast Ridge Zone in 2002) the 2004 season-long overall mena number of adult boll weevils captured per trap per week was significantly less than in the 2002 season. The mean number for 2004 was 0.163 and in 2002 it was 6.127, a reduction of 98.6% in 2004 as compared to 2002 (Figure 12).

The percentage of hostable cotton fruit damaged by boll weevils, as indicated by the 2004 survey, during the first week of September 2004 in counties located in the Northeast Ridge Zone was 0.00%, which represents a significant difference when compared to 0.86% damage calculated for the cotton growing counties in the first season-long phase of eradication (Figure 5).

The season-long overall mean number of adult weevils captured in the Northeast Ridge Zone trap line per trap per week for the 2004 growing season was 0.0689 (Figure 7).

The season-long mean number of applications in the Northeast Ridge Zone in 2004 was 6.78, in 2003 it was 8.77, in 2002 it was 11.48 and in 2001 it was 10.42 applications per acre (Figure 13). Treatments were reduced by 34.9% when applications made in 2004 were compared with 2002. Treatments in 2004 were increased along the eastern boundary adjacent to the Northeast Delta Zone.

Northeast Delta Zone

In the Northeast Delta Zone, boll weevil trap captures have been reduced following the fall diapause phase of the program in 2003, and the season-long phase in 2004. The 2004 season-long overall mean number of adult boll weevils captured per trap per week was significantly less than in the 2003 season. The mean number for 2004 was 1.59 and in 2003 it was 9.58, a reduction of 83.42% in 2004 as compared to 2003 (Figure 15).

The percentage of hostable cotton fruit damaged by boll weevils, as indicated by the 2004 survey, during the first week of September 2004 in counties located in the Northeast Delta Zone was 0.86% (Figure 6). Historically, insecticide use for boll weevil control in the Northeast Delta Zone has been significantly lower than other cotton growing areas of Arkansas. The lower insecticide use is a direct result of lower boll weevil damage levels (Johnson, 1993).

The season-long overall mean number of adult weevils captured in the Northeast Delta Zone trap line per trap per week for the 2004 growing season was 1.952 (Figure 8).

The season-long mean number of applications in 2004 was 7.41 and in 2003 it was 9.03 applications per acre (Figure 17). Treatments were reduced by 22.7% when applications made in 2004 were compared with 2003.

Conclusions

Based upon the above results, we conclude the ABWEP continues to significantly reduce weevil populations as evidenced by reduced trap captures and boll weevil damage in full season programs as compared with diapause programs.

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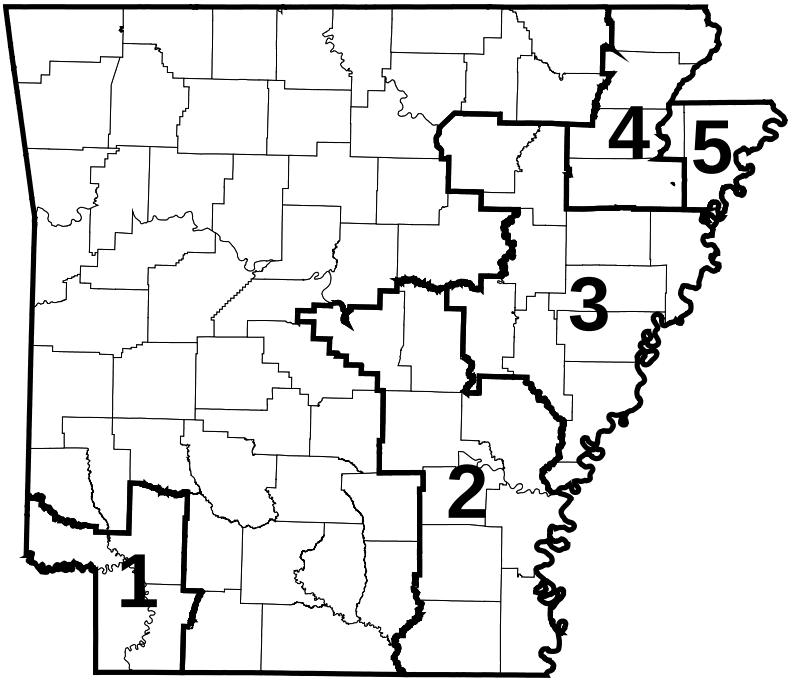

Figure 1. Boll weevil eradication zones in Arkansas, 2004.

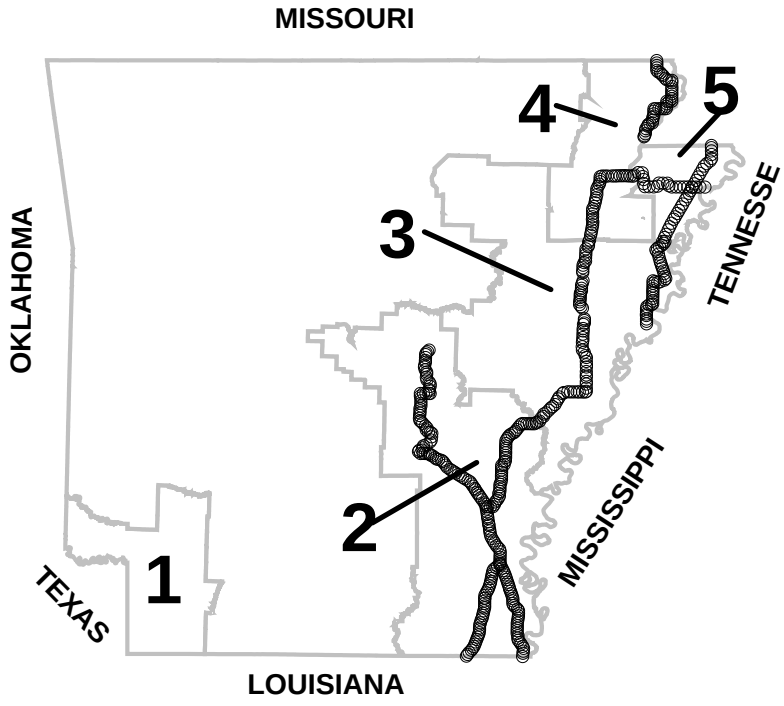

Figure 2. Boll weevil trap line locations in Arkansas, 2004.

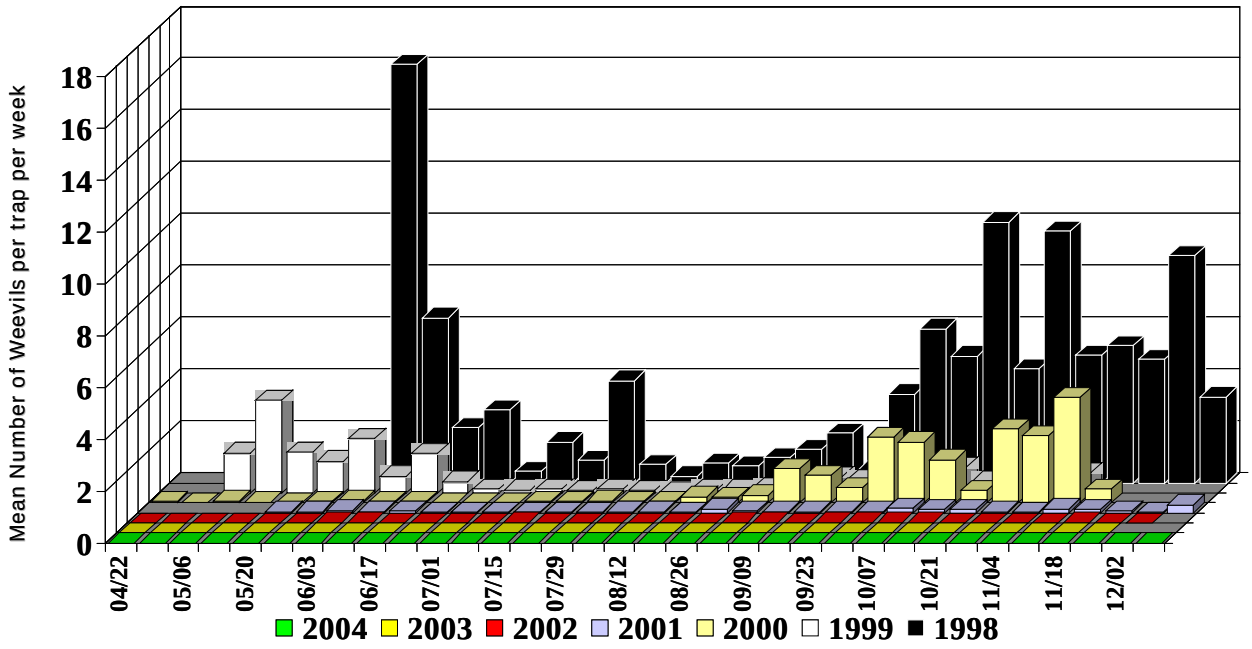

Figure 3. Mean number of adult boll weevils captured per trap per week by year, Southwest Zone.

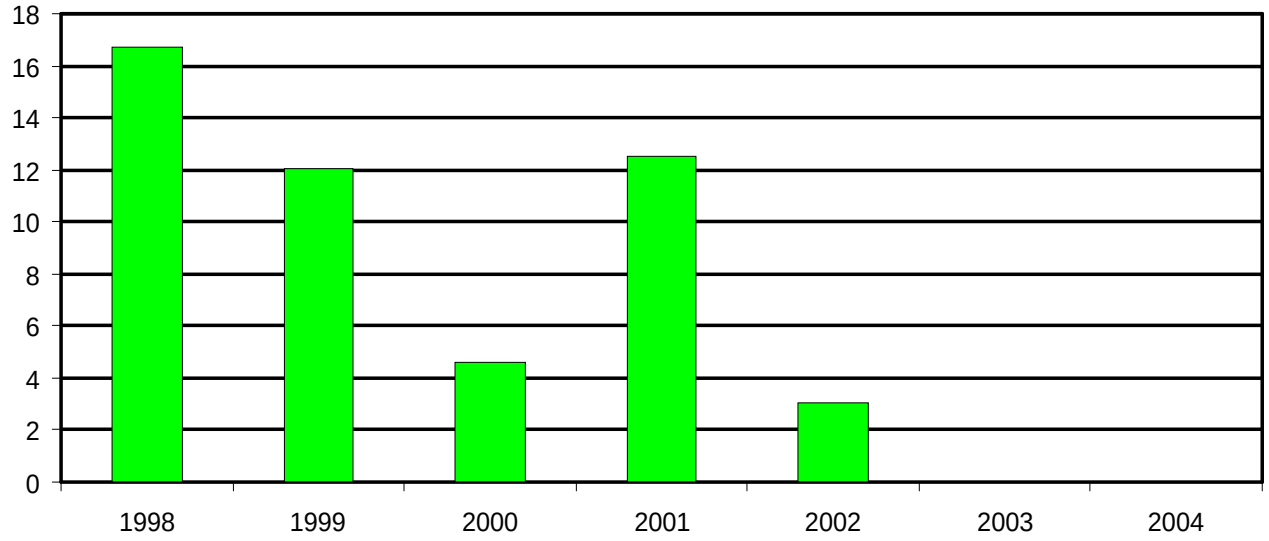

Figure 4. Season-long mean number of insecticide applications per acre in the Southwest Zone of Arkansas.

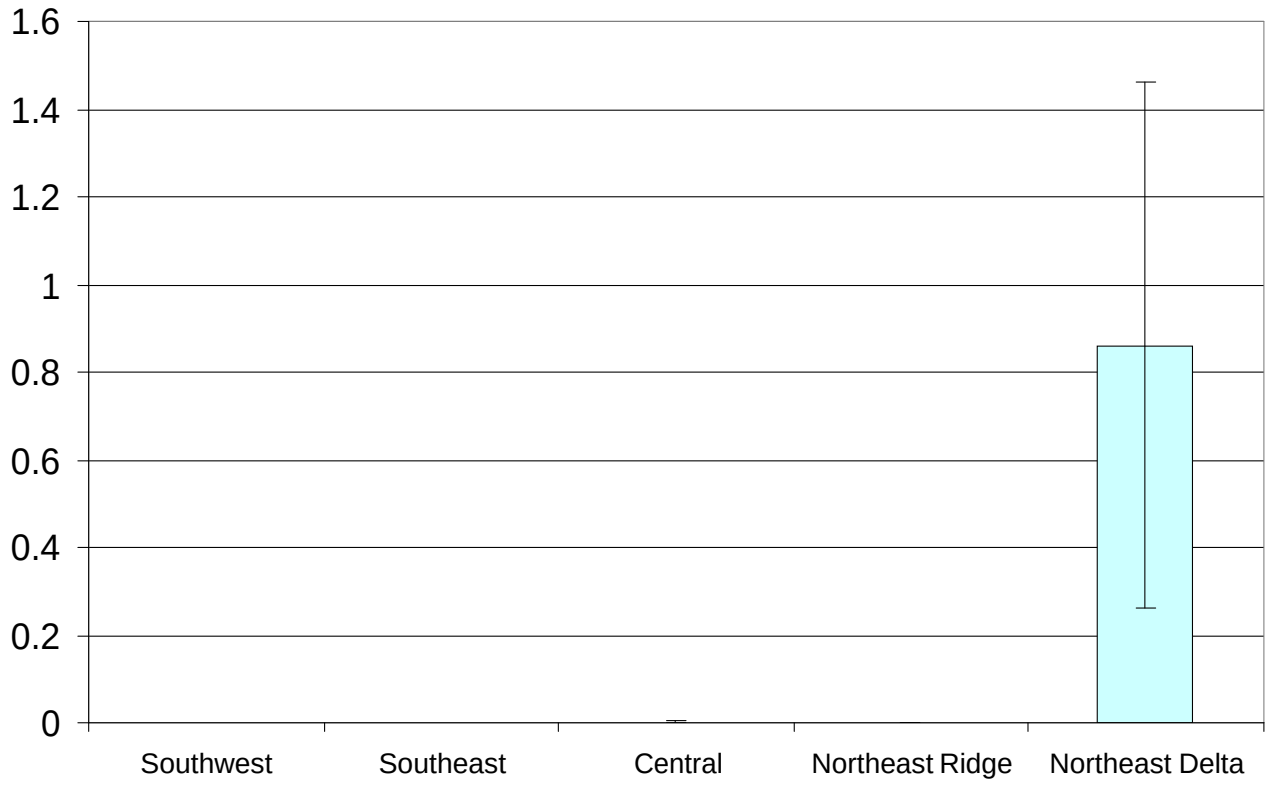

Figure 5. Boll Weevil Damage Survey. Overall percent boll weevil damage squares/bolls and standard error in the Southeast, Central, Northeast Ridge and Northeast Delta zones, Arkansas, 2004.

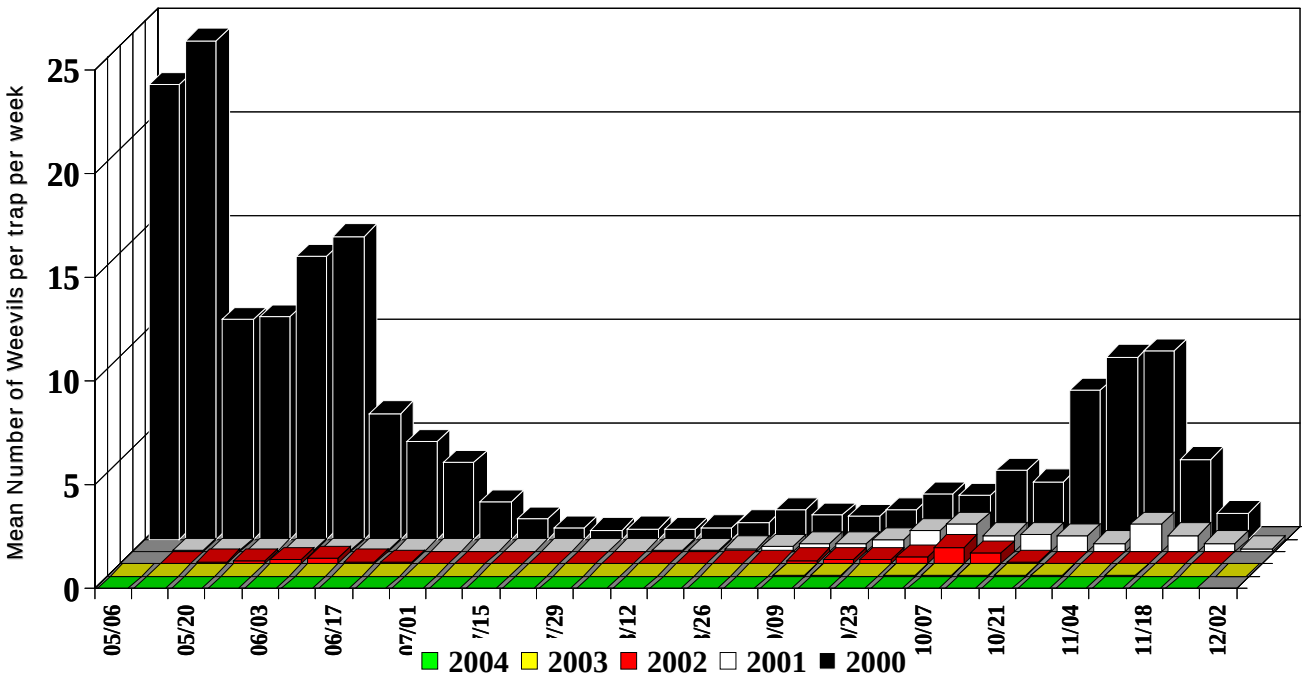

Figure 6. Mean number of adult boll weevils captured per trap per week by year, Southeast Zone.

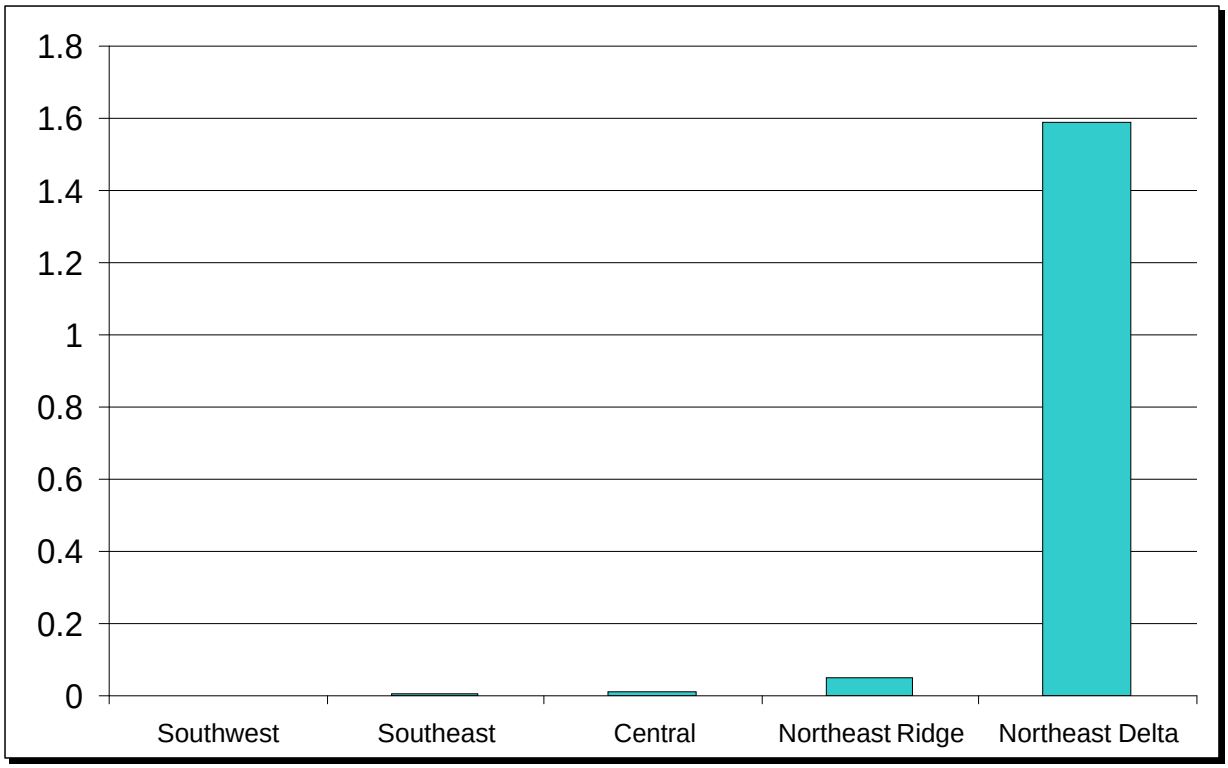

Figure 7. Season-long mean number of adult boll weevils captured per trap per week on the trap line by zone, 2004.

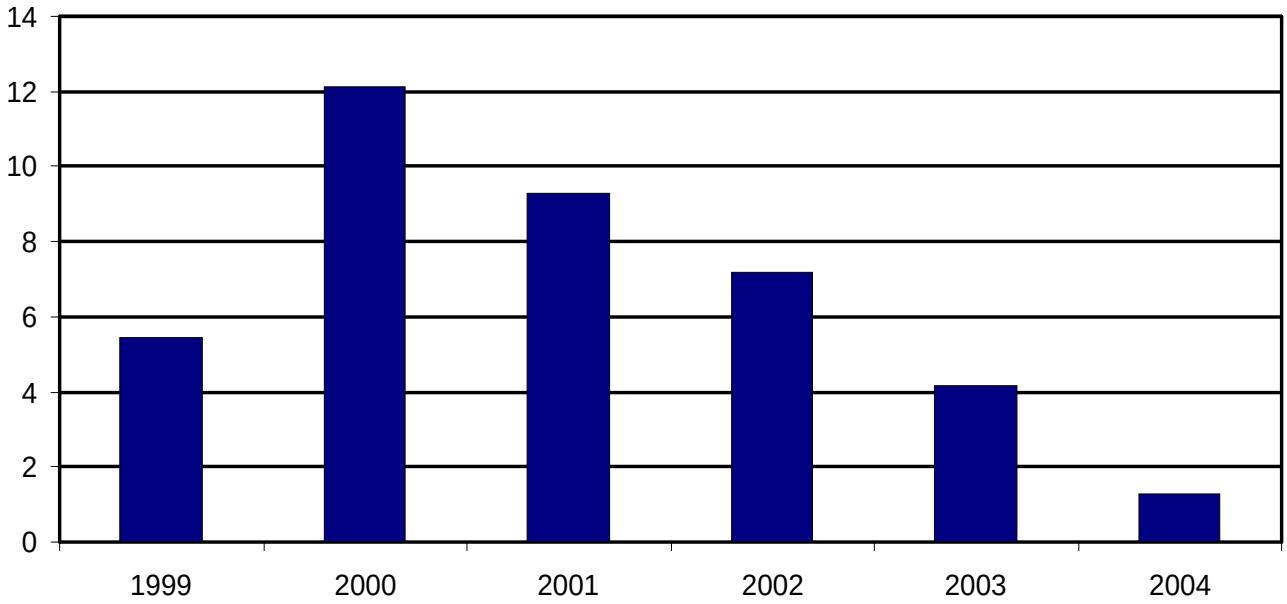

Figure 8. Season-long mean number of insecticide applications per acre in the Southeast Zone of Arkansas.

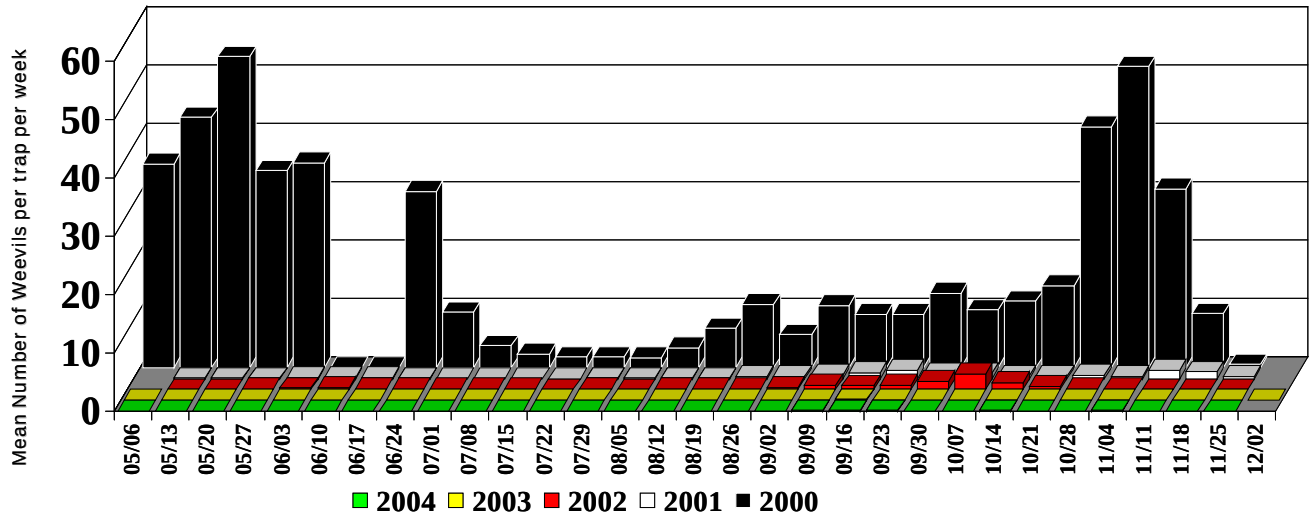

Figure 9. Mean number of adult boll weevils captured per trap per week by year, Central Zone.

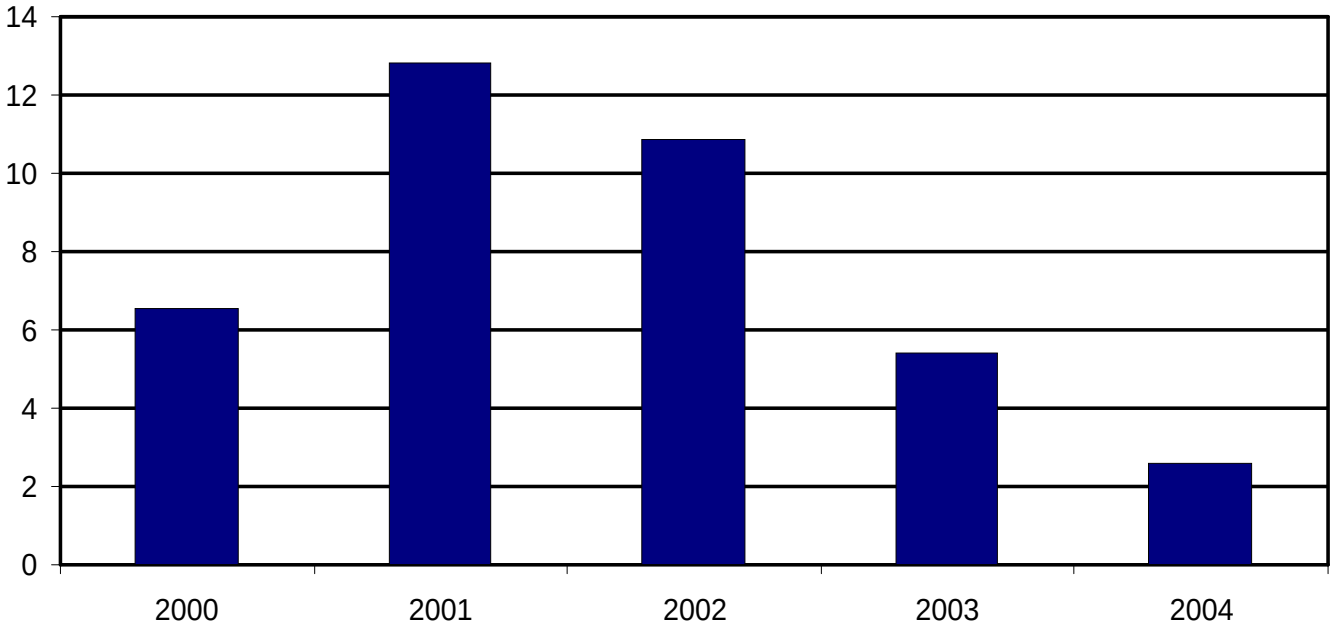

Figure 10. Season-long mean number of insecticide applications per acre in the Central Zone of Arkansas.

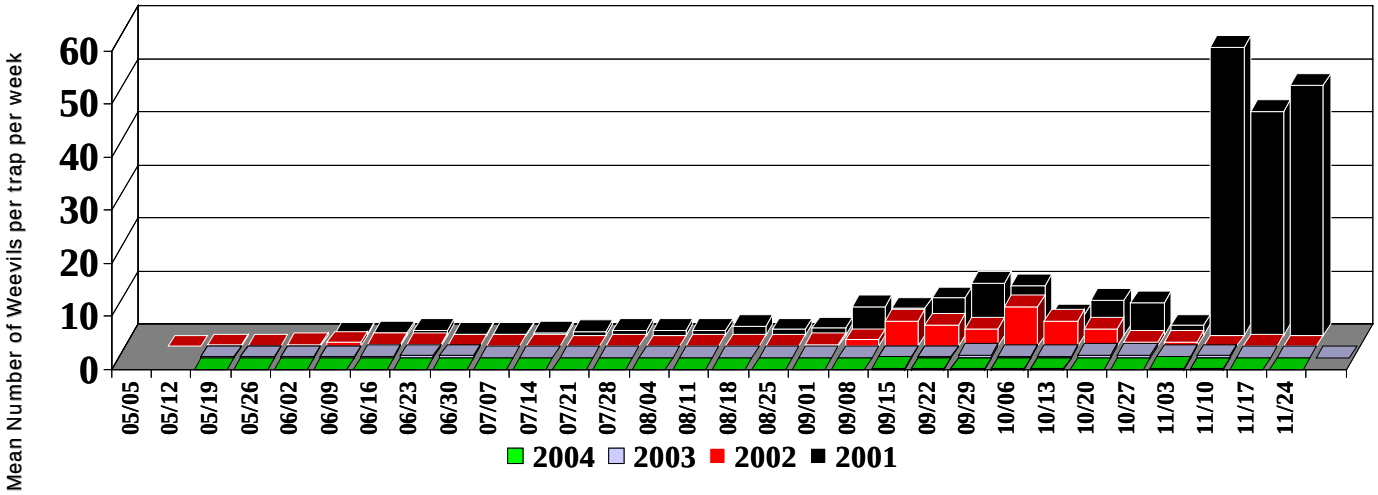

Figure 11. Mean number of adult boll weevils captured per trap per week by year, Northeast Ridge Zone without trap counts from Eastern Poinsett County.

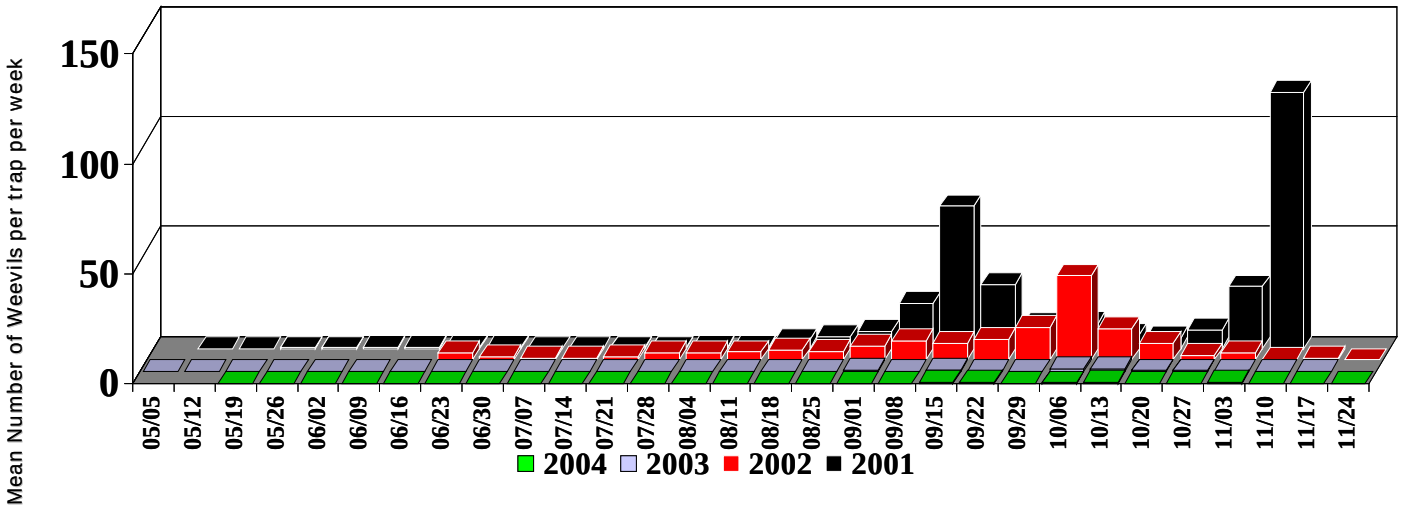

Figure 12. Mean number of adult boll weevils captured per trap per week by year, Eastern Poinsett County, Northeast Ridge Zone.

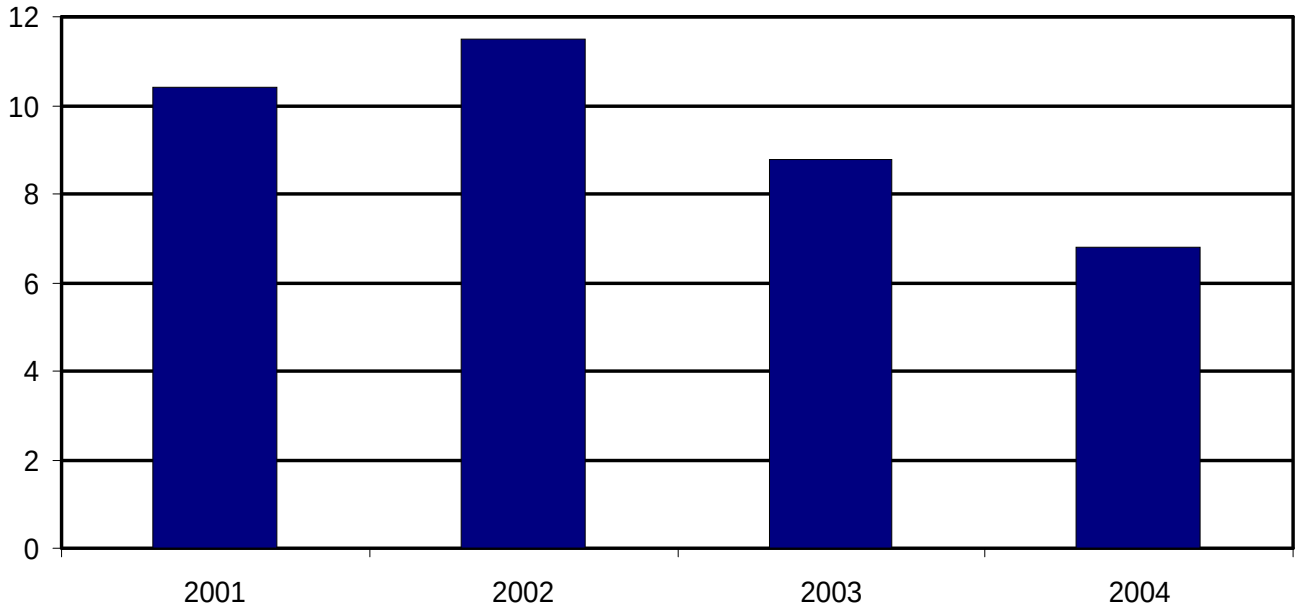

Figure 13. Season-long mean number of insecticide applications per acre in the Northeast Ridge Zone of Arkansas.

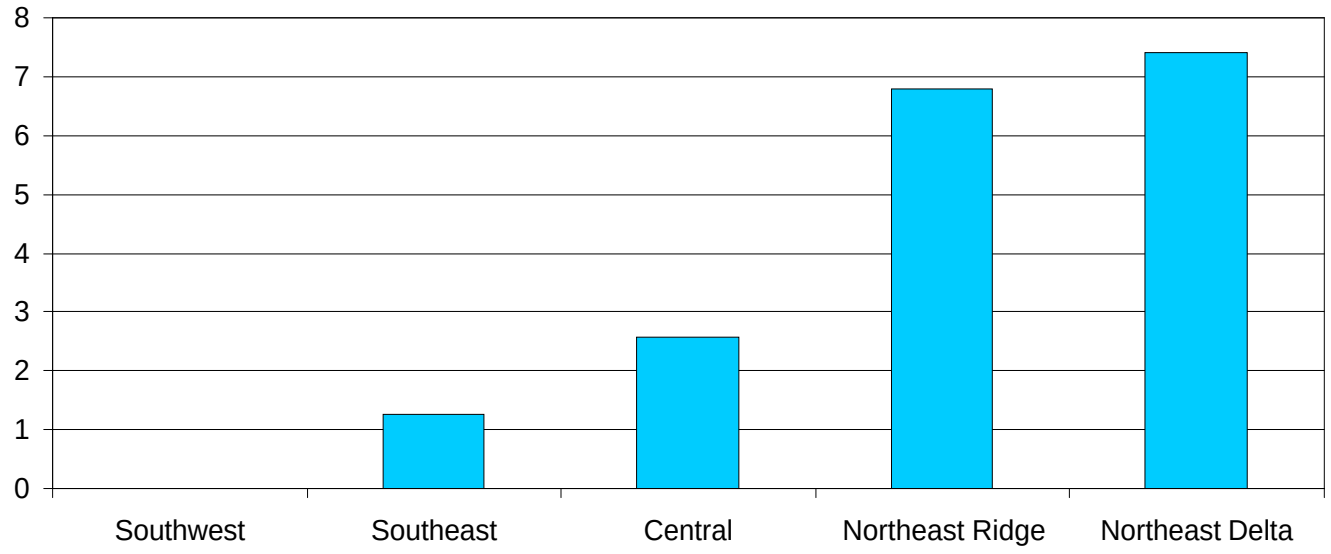

Figure 14. Overall mean number of insecticide applications per acre in the Southwest, Southeast, Central, Northeast Ridge and Northeast Delta zones, Arkansas, 2004.

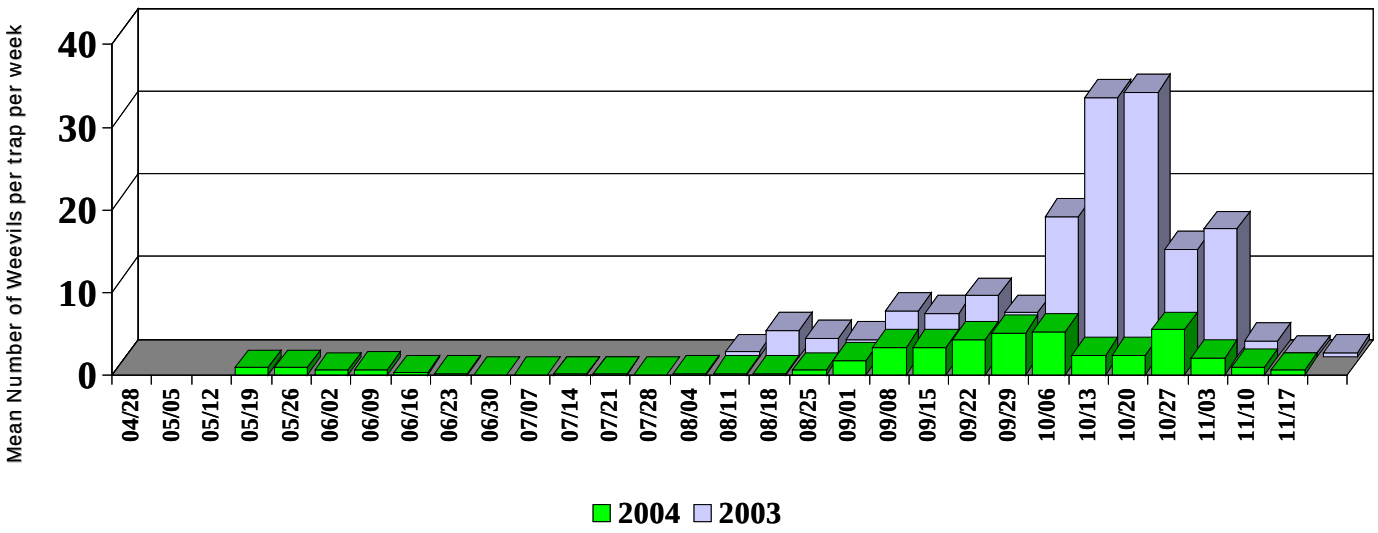

Figure 15. Mean number of adult boll weevils captured per trap per week by year, Northeast Delta Zone.

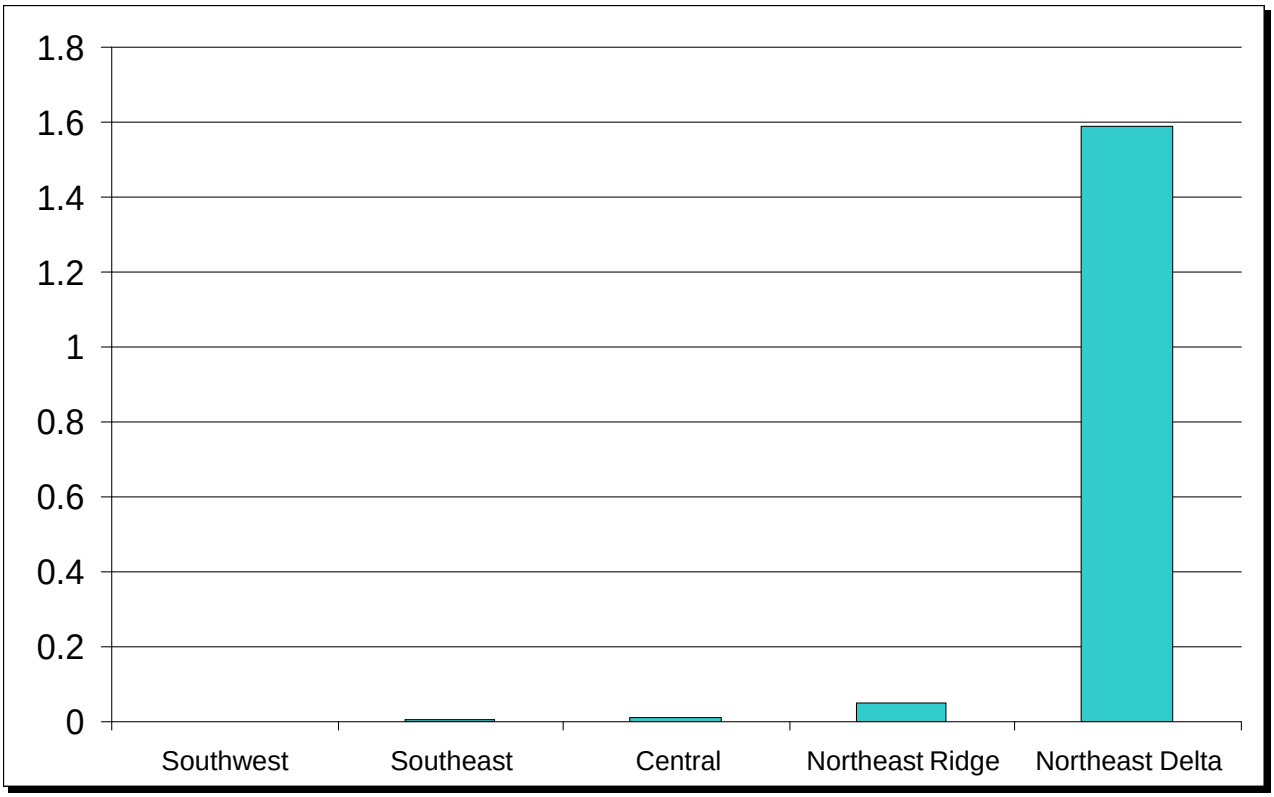

Figure 16. Overall mean number of adult weevils captured per trap per week in the Southwest, Southeast, Central, Northeast Ridge and Northeast Delta, Arkansas, 2004.

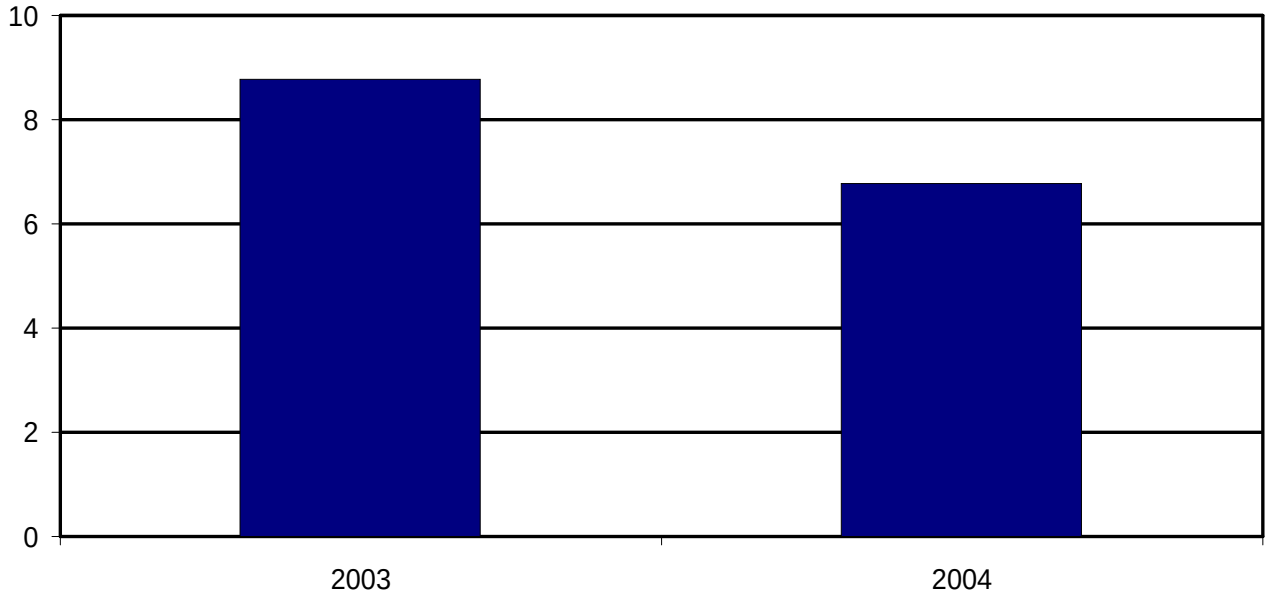

Figure 17. Season-long mean number of insecticide applications per acre in the Northeast Delta Zone of Arkansas.