

BOLL WEEVIL: POST ERADICATION OUTBREAKS IN COTTON IN THE SOUTHEASTERN UNITED STATES

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Abstract

The successes of the Boll Weevil Eradication Programs have created an expanding boll weevil free cotton production area in the southeastern United States. This post eradication area is protected by a survey trapping program with insecticide backup called the “Containment Program”. This program operates in Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama and middle Tennessee.

Introduction

The eradication program has moved generally from east to west with little separation between active and post eradication areas. With the expected natural movement of boll weevils it became necessary to have a containment program. This natural movement has caused numerous outbreaks in adjacent eradicated areas and increased eradication costs, as expected. Culin, et al (1990) discussed this and presented a model to predict this natural movement.

The boll weevil was first reported in the United States in south Texas in 1892 and by 1922 it had extended its range to North Carolina (Culin et al. 1990). During that time period the land area from the Coastal Bend of Texas to the Atlantic Coast was a continuous division of small farms. Each farm had a plot of cotton as a cash-making crop. This has evolved to large fields with consolidation into cotton production communities. These areas are sometimes separated by areas with no cotton such as other cropland, pasture and forested lands. This can reduce or delay natural movement by decreasing the certainty of the boll weevil finding cotton. However, we now have the Interstate Highways System and man’s fast moving vehicles creating a new scenario through the areas.

The subject of this paper is the unnatural movement of the boll weevil or movement with man and his equipment into the eradicated areas. This unnatural movement as shown in Table 1 causes outbreaks in many scattered and unpredictable places. It has caused significant expense to the Program both in direct control costs (Table 1) and maintaining a large active containment program in all eradicated areas. While the outbreaks and costs are documented, the causes discussed are based on circumstantial evidence. The conclusion of this evidence is that while the first time it took the boll weevil 30 years to move from south Texas to the Carolinas, today it could be done in 30 hours.

Results

The Boll Weevil as a Hitchhiker

Many of us have driven from cotton fields only to feel a boll weevil crawling from your clothes to your arms or neck. If you didn’t kill them they would hitchhike with you to your next or even final destination. While talking to growers both at fields and away from fields we have observed them flying into open vehicles and landing in pickup beds. We have watched them clinging on windshields as we moved down highways at 70 miles an hour. Quarantine regulations for farm equipment used in cotton production have for years stated that all cotton must be removed and equipment steam cleaned but what of the cabs of the transporting trucks and any of the other vehicles traveling with them. Or it could be John Q. Public simply moving from one area to another.

With many pest insects movement into non-infested crop areas takes both a male and female to start an outbreak. The boll weevil is not in this category. A single adult female is capable of starting an outbreak. The females are generally mated before migration and egg lay begins immediately on arrival at a new field (Roach et al. 1984). Roach (1979) found that 68% of overwintering females had mated in the Fall and laid fertile eggs without mating again.

Locations of Outbreaks

Most of the outbreaks listed in Table 1 occurred in counties with or near interstate highways. Of course these are where most of the cross country traffic is. There are counties such as Chowan, Gates and Beaufort in North Carolina that are definite exceptions. These are truly destination counties unless cross country drivers like the back roads to the beach.

Evidence of Cause

Containment Program trappers become curious when they catch any boll weevils. In making inquiries they sometimes find out that vehicles and/or equipment have come into the local vicinity. These incidents seem to fall into a general category not related to cotton production and classified here as non industry. The other category is related to cotton production or industry.

Non Industry Examples

1. Family visitors coming from non-eradicated areas and parking their car next to a trap. 2. People with horse trailers returning from horse events. 3. Cotton field near campground for Talladega Speedway fans had outbreaks in both 1999 and 2000. 4. Field on road to Bellingrath Gardens near Mobile, Alabama and I10 has had outbreaks in 2001 and previous years. 5. Several small field outbreaks after the Eradication Trial were next to the railroad and switch yard tracks at Rocky Mount, North Carolina.

Industry Examples

1. Consultant working active areas and then parking next to trap in an eradicated area. 2. Growers, Consultants, and Company Representatives from non eradicated area attending meeting in an eradicated area. 3. Custom harvesters from non program areas moving into eradicated areas. 4. Three North Carolina outbreaks occurred near migrant labor camps in Edgecombe Co. in 1998 and Lee Co. in 2000 and 2001. 5. Outbreak occurred in field next to large motel complex used by company representatives. 6. Movement of used field equipment has been suspect.

Both the senior author and the North Carolina State University Extension cotton insect specialist moved back and forth between program and non program areas doing research in boll weevil infested fields. This occurred season long for several years. Both of us were heavily monitored in the eradicated areas with numerous traps. Neither of us was found to be bringing hitchhiking boll weevils back. With a few simple precautions the hitchhikers can be stopped. Precautions such as keeping vehicle windows closed at cotton fields, brushing and shaking out clothes on leaving cotton fields and running vehicles through a car wash must work. Obviously individuals in cotton production are being careful or the outbreaks would be more numerous (Table 1). But more care must be given. We do not need to defeat our purpose to reduce cotton production costs and increase grower profits.

We know the trapping of the Containment Program is well worth the effort. Without it there would not be eradication. The numbers of individual trapped boll weevils and their locations are much greater than the recorded outbreaks. Remember if you grow cotton in the Carolinas or Virginia the boll weevil is only 30 hours away via the Interstate.

Literature Cited

Culin, Joe; S. Brown; J. Rogers; D. Scarborough; A. Swift; B. Cotterill and J. Kovach. 1990. A simulation model examining boll weevil dispersal: historical and current situations. *Environ. Entomol.* 19:195-208.

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Table 1. Outbreaks by state, year, counties, numbers of boll weevils (BW) trapped and cost.

YEAR	COUNTY	BWs TRAPPED	COST
ALABAMA			
1993 -1994	Houston ^s	309	\$23,000
1994 -1995	Geneva ^s	2904	\$118,000
1995 -1996	Henry ^s , Dale ^s	1271	\$72,000
1997 – 1999	Washington	5345	\$482,000
1999	Coffee ^s , Conecuh ^{s1} , Mobile ^{s1}	2080	\$22,000
1999	Autauga ¹	12	\$10,000
1999	Shelby ¹ , Talladega ¹	838	\$92,000
1999	Butler, ^{s1} Pike ^s	3	\$36,000
1999	Limestone ¹	112	\$10,000
FLORIDA			
1993 – 1994	Calhoun ^s	713	\$38,000
1997 – 1998	Escambia ^s	123	\$41,000
GEORGIA			
1994 –1996	Elbert	16154	\$1,020,593
1995 –1997	Brooks ^{s1}	2621	\$672,000
1996 – 1997	Dougherty	61	\$79,000
1997 – 1999	Lowndes ^{s1}	12057	\$241,000
1997 –1999	Thomas ^s , Grady ^s	2740	\$111,000
1998 – 1999	Macon ¹ , Houston ¹	40	\$128,000
1999	Crisp ¹ , Wilcox	3049	\$119,000
1999	Hart ¹	117	\$17,000
NORTH CAROLINA			
1987	Cleveland ¹	93	\$6,350
1987	Edgecombe ¹	2	\$3,150
1987	Robeson ¹	1	\$1,550
1987	Robeson ¹	15	\$1,400
1988	Chowan	3	\$3,050
1988	Edgecombe ¹	9	\$3,300
1989	Rutherford ¹	1	\$2,800
1989	Cleveland ¹	36	\$3,700
1990	Cleveland ¹	1	\$2,300
1992	Cleveland ¹	1	\$1,700
1993	Beaufort	1	\$1,450
1994	Sampson ¹	19	\$17,650
1994	Sampson ¹	12	\$6,100
1994	Bladen	2	\$3,700
1994	Gates	1	\$3,000
1995	Gates	3	\$4,300
1995	Northampton ¹	2	\$1,700
1995	Chowan, Cleveland ¹ , Union	4	\$10,250
1995	Cleveland ¹ , Rutherford ¹	1	\$2,400
1996	Rowan ¹	26	\$7,700
1996	Halifax ¹	1	\$2,800
1997	Pender ¹	143	\$11,200
1998	Edgecombe ¹	2303	\$130,000
1998	Iredell ¹ , Jones, Wayne	3	\$5,600
1998	Pitt	8	\$7,000
1998	Wayne	1	\$3,075
1999	Edgecombe ¹	4	\$14,250
1999	Union	1	\$3,900
1999	Union	1	\$5,775
SOUTH CAROLINA			
1995 -1997	Orangeburg ¹	23,899	\$1,300,000
1999	Lexington ¹	3	\$9,000
VIRGINIA			
1995	Greenville ¹	335	\$177,000
TOTALS		77,495	\$5,108,993

I: Counties with or very near Interstate Highways.

s: southern counties with a history of harvesting by equipment moving in from other states.