2001
Southwest Oklahoma Entomology Report

Miles Karner
Area Extension Entomologist
Oklahoma Cooperative Extension Service

Entomology Activities

Insect monitoring is a key component in a successful IPM program. Trapping activities in 2001 included Southwest, West Central and Northern Oklahoma. Trapping activities in 2001 centered on the beet armyworm and the bollworm complex. Population trends, insect updates, and control tips are published in the Cotton Sentry and distributed to the state's cotton producers and consultants to help formulate management strategies to enhance profitability.

Like 2000, Bt transgenic technology was the focus of this year's research. Monetary support received throughout the year permitted this applied research to continue. Besides State IPM funds, I want to thank all the chemical companies for their contract research support. Special thanks go to the cotton producers for their support as cooperators and support through the Cotton Incorporated State Support Funds.

Table of Contents

Oklahoma Cotton Insect Report 2001

Oklahoma. A total of 190,000 acres were planted. Turbulent weather hampered cotton development throughout May. Below average rainfall in most regions of the state through mid-August favored irrigated production and limited dryland production reducing harvested acres to 180,000 acres. Abundant heat units resulted in a total of 3001 heat units accumulated between May 1 and October 1 exceeding the 50-year average of 2,881 heat units. The state's production average is projected at 575 lbs. of lint per acre.

Despite widespread use of at-planting insecticides, thrips infestations built to damaging levels across the state. Cotton fleahopper infestations were widespread requiring many fields to receive two insecticide applications to prevent significant yield loss.

Bt cotton continues to be very popular in Oklahoma. Bt cotton represented 57% of the cotton acreage in 2001. Light bollworm populations existed throughout the summer. Conventional cotton received 1 or 2 insecticide applications to prevent damage. Stink bug and whitefly infestations surfaced in July requiring treatment on limited acreage mainly in irrigated situations.

Cotton aphid infestations flared during July. Heaviest infestations were associated with active OBWEO programs in Southwest Oklahoma. Only District 1 comprising 5 Counties (Harmon, Greer, Jackson, Kiowa and Tillman) was cleared for Furadan use to control resistant cotton aphids. Heaviest infestations occurred in cotton intensely managed. Severe yield loss would have occurred if Furadan had not been available for use. This aphid buildup was short lived and did not reoccur.

Ongoing Research Projects

Oklahoma. Several Bt cotton trials were conducted in 2001 to further evaluate the value of this technology under Oklahoma conditions. Prior to the 2001 season, Bt cotton provided sufficient bollworm control and increased yields to compensate for rental fees in all entries under irrigation. However, this year 55% of the Bt picker variety entries and 50% of the Bt stripper variety entries failed to out-produce conventional variety parents, resulting in a monetary loss. Drought limited dryland cotton production reducing yields dramatically. For the second straight year Bt stripper varieties yields failed to compensate for rental fees increasing the monetary loss compared to conventional varieties.

This was the sixth year that Heliothine infestations failed to reach levels in economic threshold trials to activate insecticide applications. Heliothine pressure remained below 5 larvae (> 3/8 inch long) per 100 terminals. Insecticide protection was to be applied if infestations approached 10 larvae (> 3/8 inch long) per 100 terminals. Biweekly tagging of eggs and newly hatched larvae revealed no Heliothine survival at tagged sites. All newly hatched larvae died before any of the larvae reached ½ inch long.

Research continued in 2001 to determine the influence of planting date on cotton yields under dryland conditions. Previous research during years with high boll weevil survival indicates planting date is critical regardless of management scheme to raise profitable cotton. Yield results favored June-planted cotton.

Nodes Above White Flower (NAWF 4) is a reliable method to determine the last cohort of bolls that will contribute significantly to yield and accurate termination of scouting activities. A three-year study began this summer to see if the absence of late-season boll weevil infestations enhanced the value of the top crop. Preliminary results indicated that there was no change in the value or the last cohort of bolls to contribute to yield.

Bollworm / Tobacco Budworm and Beet Armyworm Monitoring

Bollworms/tobacco budworms are targets of many of the insecticide applications applied annually on cotton in Oklahoma. Monitoring moth activities helps determine species ratio and peak ovipositional activity for these insects. Pheromone trap surveillance was expanded in 2001. Besides Jackson, Harmon and Tillman Counties, the west Central region (Custer, Kiowa and Washita County) and the Northern Region (Grant and Kay County) were also trapped (Table 1). Traps were located near these farming communities – Altus, Hollis, Tipton, Hobart, Manchester, and Blackwell. In addition to Heliothine activity, beet armyworm movements were also monitored at each location. Traps were maintained between June 1 and September 1, 2001.

Table 1. Moth Pheromone Trap Catch Totals for Selected Regions of Oklahoma, Summer 2001.

Bollworm					
Southwest			Central	Northern	
Altus	Tipton	Hollis	Hobart	Manchester	Blackwell
553	233	2,776	507	44	73
Tobacco Budworm					
Altus	Tipton	Hollis	Hobart	Manchester	Blackwell
149	299	249	20	46	39
Beet Armyworm					
Altus	Tipton	Hollis	Hobart	Manchester	Blackwell
249	311	447	294	859	371

Although both species do coexist and are considered the same, this species ratio is important since tobacco budworms exhibit a higher level of resistance to insecticides than bollworms. It is extremely important to detect fluctuations in species ratio of each ovipositional period and adjust insecticide recommendations accordingly. A total of 4,988 moths were captured between the week of June 1 and the week of September 1. Bollworms comprised 83.9% of the total catch across the state in 2001 (Figure 1). However, the percentage varied widely from 57.9% of the catch (in Northern Oklahoma) to 96.2% of the catch (in West Central Oklahoma) (Figure 2). No control difficulties were reported in 2001. Reduced Heliothine pressure and an increased acreage planted to Bollgard™ cotton were the main reasons limiting control problems across the state.

Figure 1. Species composition of moths trapped across Oklahoma, Summer 2001.

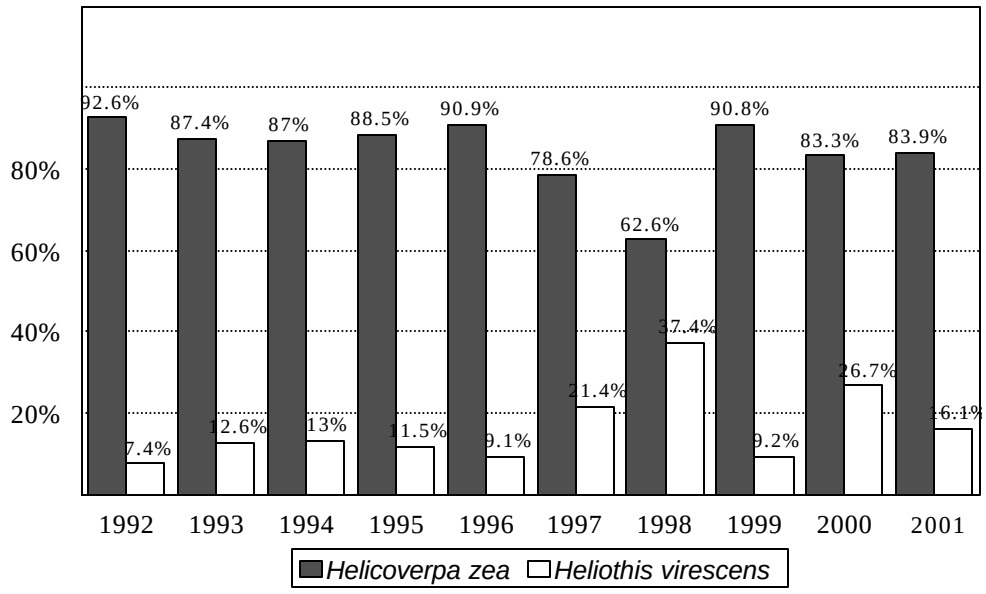
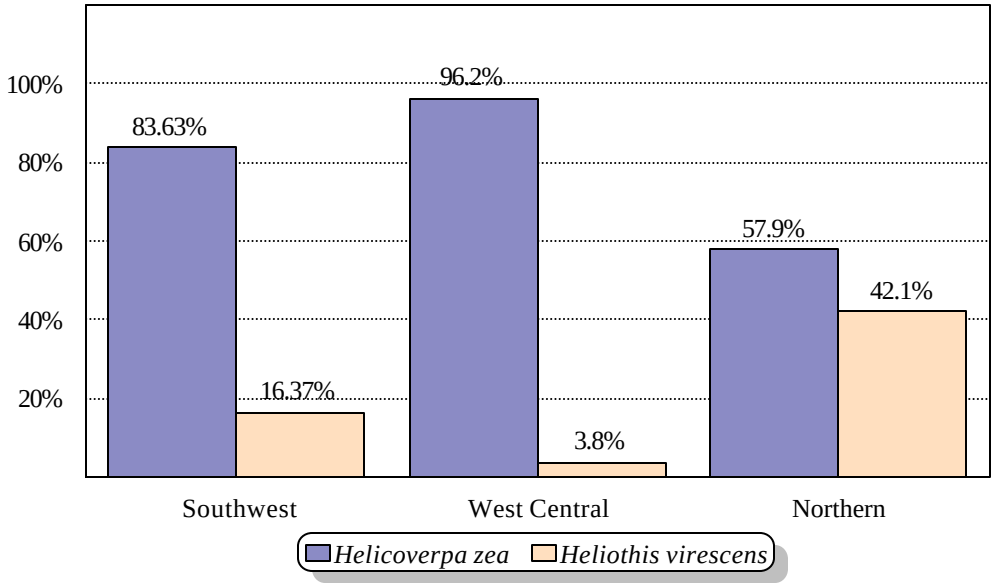


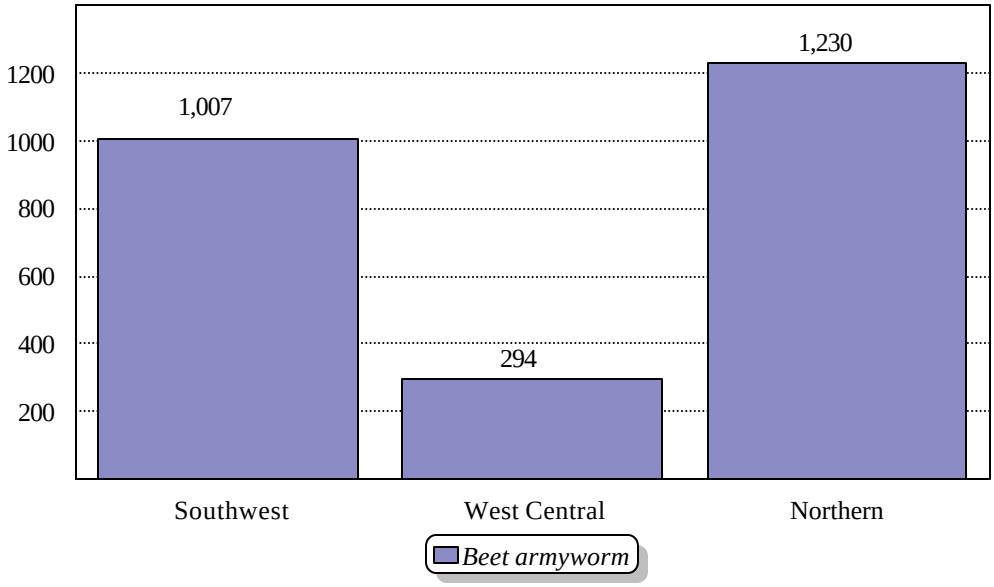
Figure 2. Species composition of trapped moths by production region, 2001.



Beet Armyworm Monitoring

A total of 2,531 beet armyworm moths were captured in Oklahoma in 2001 (Figure 3). Greatest numbers were recorded in Northern Oklahoma; however, no field infestations were observed. In-field infestations only occurred in the Southwest Region of the state. Lateness of the overall infestation and popularity of Bollgard™ cotton were factors that lessened the impact of beet armyworms in 2001.

Figure 3. Beet armyworm moths trapped by region across Oklahoma, 2001.

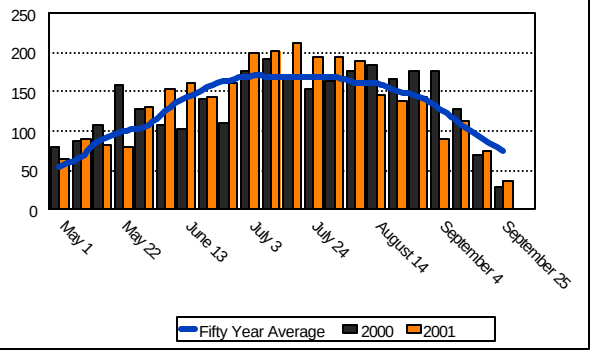


Growing Degree Days Accumulation For Select Locations Across Oklahoma, summer 2001.

Altus

Growing Degree Days (GDD)

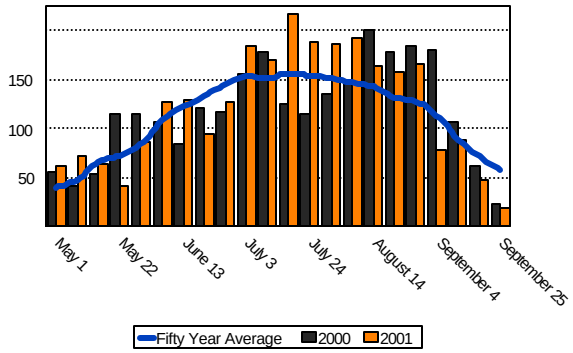
Month	50-year	2000	2001
May	418.0	560.6	**449.4**
June	591.0	463.3	**618.6**
July	680.0	689.7	**809.6**
August	788.0	880.3	**745.1**
September	404.0	403.9	**313.0**
Total	2,881.0	2,997.8	**2,935.7**



Blackwell

Growing Degree Days (GDD)

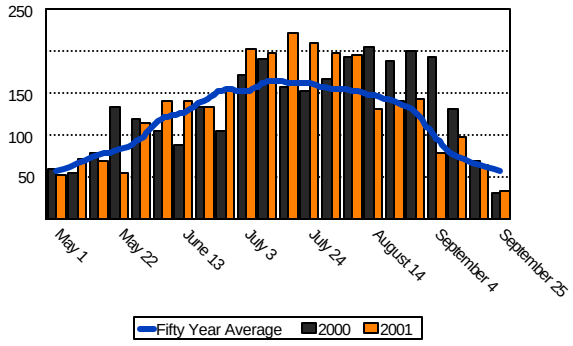
Month	50-year	2000	2001
May	312.0	380.6	**326.8**
June	510.0	431.2	**477.1**
July	615.0	573.7	**760.2**
August	702.0	890.8	**816.6**
September	333.0	371.3	**234.2**
Total	2,472.0	2,647.6	**2,614.9**



Hobart

Growing Degree Days (GDD)

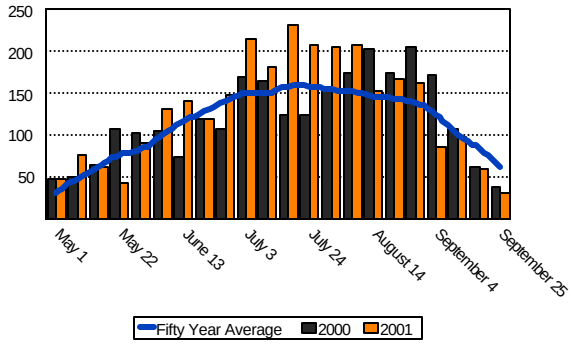
Month	50-year	2000	2001
May	377.9	444.4	**362.3**
June	541.8	429.5	**568.8**
July	639.9	672.0	**831.8**
August	719.5	994.2	**726.7**
September	289.3	423.0	**271.0**
Total	2,568.4	2,963.1	**2,760.6**



Alva

Growing Degree Days (GDD)

Month	50-year	2000	2001
May	298.4	373.8	**317.1**
June	448.6	404.6	**538.8**
July	615.9	583.8	**834.4**
August	733.8	954.6	**817.7**
September	369.0	376.5	**273.5**
Total	2,465.7	2,693.3	**2,781.5**



STINK BUGS – AN EMERGING PEST IN OKLAHOMA COTTON FIELDS

Miles Karner and Jerry Goodson
Oklahoma State University
Altus, OK

Abstract

Results of a consultant survey conducted in the fall of 2001 revealed that the cotton fleahopper was the number 1 pest in the state. Bollworms remained number 2 (despite Bollgard's popularity) tying thrips in dryland situations. Stink bugs grabbed the 4th spot and cotton aphids the 5th spot. Despite the interest generated by the presence of stink bugs in Oklahoma in 2001 only 4.9% of the irrigated acres surveyed were sprayed to prevent injury. Respondents agreed that depressed cotton prices could be as detrimental to their business as the boll weevil and may eventually force them out of consulting all together.

Introduction

Oklahoma's cotton industry is starting to reap the benefits of a highly successful boll weevil eradication program. Low surviving numbers across the state reduced the number of OBWEO sprays needed to prevent in-season reproduction in 2001. As a result a large percentage of the cotton acreage received little if any insecticides during mid-to-late season. Besides the absence of boll weevils to trigger sprays, the continued popularity of Bollgard cotton (approximately 107,000 acres planted to Bt cotton in 2001) also reduced the number of pyrethroid sprays normally required to control Heliothines in conventional cotton. This insecticide-free environment allowed many new insect faces to appear in Oklahoma cotton fields in 2001. The new faces seen in 2001 included general plant feeders consisting of stink bugs (in descending order of abundance - green stink bug, conchuela stink bug and brown stink bug) and leaf footed bugs.

General plant feeders pierce immature bolls with their needle-like mouthparts and extract plant juices. This feeding produces a dark, sunken spot on both the exterior and interior of bolls and is easily confused with tarnished plant bug injury especially on small 2 to 4-day old bolls. Concerns about general feeder buildups started in late-July. I was hesitant to address general plant feeders as potential pests since stink bug phobia had surfaced across the state in previous years. Much of this phobia stemmed from Farm Press articles highlighting problems associated with stink bugs from other production regions across the United States. However, more and more inquiries coupled with a gradual and steady increase in numbers pointed to the emergence of stink bugs as a potential pest as the state shifts into the post-eradication era.

Stink bugs were featured in the Cotton Sentry Insect Newsletter from the July 18th issue through the final edition on August 18, 2001. During that time period, stink bug numbers rose steadily from infesting 50% of cotton fields scouted the week of July 18 to a whopping 81.3% of the fields scouted the week of August 18, 2001. Despite their presence, only 15.7% of these fields required protection to prevent stink bug damage.

Due to the interest generated by the presence of stink bugs in 2001 a consultant survey was mailed to cotton consultants across Oklahoma. The purpose of this survey was to determine if consultants perceived stink bugs as an emerging pest and to seek their opinions on various other insect management issues. This survey was mailed on August 23, 2001, to get their thoughts while the season was still fresh in their minds. Despite incentives to return the survey, only 46.6% of those surveyed completed and returned it.

Results and Discussions

The first part of the survey builds a profile of the current cotton consultant in Oklahoma. The average length employed as a consultant was 11.4 years. Consulting fees varied depending on cropping scheme. Dryland cotton fees ranged from 21.4 cents to 35.7 cents/acre per week for basically once-a-week scouting. The average cost for a typical 14-week season was $4.28/acre. Irrigated cotton fees were higher due to the practice adhered by the majority of consultants surveyed - scouting as needed. This procedure relies on shortening the scouting interval only when building insect populations warrant. Again fees varied ranging from 25 cents to 39.3 cents/acre per check per week. The average fee charged for irrigated cotton was

$5.91/acre for 20 checks during a typical 14-week season. Cotton acreage serviced varied widely. Seventy-one percent of the consultants checked an average of 2,580 acres of dryland cotton weekly. While 85% of the consultants surveyed checked an average of 3,700 acres of irrigated cotton each week during the summer. The average consultant surveyed, checked and made insect control recommendations on approximately 5,156 acres of cotton during the 2001 growing season.

Variety selection is always of interest as producers and consultants try to select the best adapted varieties to enhance production. Transgenic cotton varieties are very popular. Dryland production favors single gene stripper varieties while irrigated production favors stacked gene picker varieties. Most popular cotton varieties for dryland production (in descending order) were: Paymaster 2200RR, Paymaster 2326RR, Delta Pine 2156RR, Paymaster 2326BR, and Paymaster 2280BR. The most popular picker cotton varieties for irrigated production (in descending order) were: Paymaster 1218BR, Stoneville 4892BR, Delta Pine 451BR, Delta Pine 458BR. Paymaster 2280BR and Paymaster 2326BR were the most popular stripper cotton varieties grown under irrigation.

The next portion of the survey addressed insect pests and insecticide use patterns. As expected there were differences in pest rankings and insecticide usage between dryland and irrigated production (Table 1&2). The cotton fleahopper was the number 1 pest in the state. Bollworms remained number 2 (despite the Bollgard popularity) tying thrips in dryland situations. Stink bugs grabbed the 4th spot and cotton aphids the 5th spot. Prior to boll weevil eradication, the boll weevil would battle the bollworm for the top spot followed by cotton aphid, cotton fleahopper and thrips.

Insecticide usage pattern is quite different. All the insecticide applications applied to dryland cotton were directed at controlling thrips and cotton fleahoppers. Thirty-nine percent of the dryland acres surveyed received thrips protection. Twenty-nine percent of the treated acres received two applications to prevent thrips injury. Bidrin and Orthene were the products of choice for thrips control. Forty-seven percent of the dryland cotton received protection to prevent cotton fleahopper damage. Twenty-seven percent of the treated acres received two insecticide applications. Vydate, Orthene, and Bidrin were the insecticides preferred by the respondents for cotton fleahopper control.

Greatest insecticide usage occurred in irrigated cotton. Fifty-two percent of the irrigated acreage received some sort of thrips protection. Temik was applied infurrow on 32.3% of the treated acres while over-the-top sprays of Orthene and Bidrin accounted for the remaining 19.9% of the acres sprayed to prevent thrips injury. A whopping 95.9% of the irrigated acres were sprayed to prevent cotton fleahopper loss. Eleven percent of the surveyed acres received two insecticide applications. Vydate, Orthene, and Bidrin were the insecticides most often mentioned by respondents. The high percentage receiving fleahopper protection reflects the emphasis on earliness by producers and consultants alike and the dependency on overwintering sprays to delay boll weevil infestations. Prior to boll weevil eradication, 1 to 2 overwintering sprays were automatically applied prior to bloom to prevent boll weevil colonization. This practice was so religiously followed that it is very hard for some to break as weevil numbers dropped. These pinhead square applications may helped suppress early season buildups of general plant feeders reducing the acreage that warrant stink bug protection during boll set.

Bollgard influence is readily seen in the amount of irrigated acres treated to prevent bollworm loss in 2001. Only 15.8% of the total acres surveyed received bollworm protection. Pyrethroids remain the product of choice for bollworm control (at least during light beet armyworm years). Fury and Karate were the only pryrethroids mentioned by the respondents.

Stink bugs were the target of insecticide applications on only 4.9% of the irrigated acres surveyed. Fifty-seven percent of the consultants surveyed sprayed for stink bugs. Seventy-one percent of those surveyed were not surprised by the emergence of the stink bugs in 2001. When asked to explain the economic threshold use to determine damaging infestations, only 28% of the consultants that sprayed stink bugs listed anything. Responding consultants mention slicing and examining the inside of bolls for signs of feeding and discoloration and delaying treatment until 10 to 20% of the bolls sliced showed internal injury. When asked what was the reasons for the appearance of stink bugs as a pest responding consultants replied reduce use of insecticides to control bollworms and boll weevils. For broader spectrum insect control, consultants opted to use Fury or Karate. Bidrin was the product of choice where cotton aphids were present or producers feared releasing cotton aphids by using a pyrethroid.

Only 3.9% of the cotton acreage survey received Furadan to control cotton aphids in 2001. Cotton aphid numbers has gradually declined since 1996. Much of this population decline is attributed to waning dependency on insecticides and the popularity of Bollgard cotton promoting an environment that allows beneficial insects to flourish and regulate cotton aphids and other potential insect pests below economic threshold levels.

Finally, consultants were asked if continued depressed prices would impact their business. All responded yes with some fearing that prolonged depression in cotton price would not only be detrimental to their business but may eventually force them out of consulting all together.

Conclusion

A successful boll weevil eradication program coupled with continued popularity of Bollgard cotton has decreased the dependency on insecticides creating an insecticide-free environment that favored the development of general plant feeders not considered a pest in cotton before the 2001 season. Despite their emergence - the cotton fleahopper, thrips, and the bollworm were the top three insect pests in 2001. Responding consultants agreed that depressed cotton prices are detrimental to their business. The irony of the situation is depressed prices - not the boll weevil could eventually force many of them to quit consulting and seek other employment.

Acknowledgments

Special thanks to Mr. Ron Coggeshall for his assistance in survey analysis and the consultants that took the time to complete and return this survey. Their opinions will help direct Extension Entomology efforts in planning research activities in the future.

Table 1. Top Five Insect Pests - 2001

Dryland Production	**Irrigated Production**
♦ Cotton Fleahopper	♦ Cotton Fleahopper
♦ Thrips/Bollworm	♦ Bollworm
♦ Stink Bug	♦ Thrips
♦ Cotton Aphid	♦ Stink Bug
	♦ Cotton Aphid

Table 2. Insecticide Use Pattern for Various Production Systems in Oklahoma in 2001

Insect	**Acres Treated %**	**Products**
	Dryland Cotton	
Thrips	39[1], 29[2]	Bidrin/Orthene
Cotton Fleahopper	47[1], 27[2]	Vydate, Orthene, Bidrin
	Irrigated Cotton	
Thrips	32.3 infurrow	Temik
	19.9[1], sprays	Orthene/Bidrin
Cotton Fleahopper	95.9[1], 11[2]	Vydate, Orthene, Bidrin
Bollworm	15.8[1]	Fury/Karate
Stink Bug	4.9[1]	Fury, Karate, Bidrin
Cotton Aphid	3.9[1]	Furadan

[1] = Percent of acreage receiving 1 application
[2] = Percent of acreage receiving 2 application

Economic Value of Bt Transgenic Cotton

Each year economic budgets and cost analysis are prepared to determine the value of Bt transgenic varieties and conventional varieties. These comparisons lumped varieties into two groups (Bt and conventional) regardless of maturity, variety type, or spray regime. Regardless of the management scheme or insect pressure Bt transgenic cotton yielded the best and increased profitability (return per acre) throughout the 6-year period 1996 – 2001. Irrigated Bt cotton cost comparison for 2001 (Table 1) was the lowest return during the 6-year period. Growing Bt transgenic variety was worth $11.41 per acre. Since its introduction in 1996 this research indicates that the value of investing in Bt transgenic technology between 1996 – 2001 (Table 2) was $ 34.84 per acre (weighted average) or $9,287,647 (Bt transgenic acreage = 266,580 acres for 6 years)

Irrigated Bt Transgenic Cotton Cost Comparison - 2001[1]
A.L. Hutson

		Bt Transgenic		Conventional
Return				
Cotton	1,122#	$561.00	1,006#	$503.00
Operating Inputs				
Seed	15# @ .70	$ 15.30		$15.30
Bt Cost		30.30		---
Hoeing		15.00		15.00
Herbicide		8.00		8.00
Nitrogen		24.88		24.88
Phosphorous		6.00		6.00
Ginning		33.66		30.14
Harvest Aid		27.95		27.95
Spraying[2]		23.14		23.14
Crop Insurance		20.00		20.00
Custom Harvest		100.98		90.54
Labor		22.75		22.75
Fuel, Lube & Repair		24.00		24.00
Boll Weevil		18.72		17.56
Irrigation		45.00		45.00
Operating Interest		8.57		7.36
Total Operating Cost		$424.25		$377.66
Return to Land, overhead, Risk & Management		$136.75		$125.34

[1] Based on 21 replicated tests.
[2] Chemical use same on Bt transgenic and conventional. Orthene, Bidrin and Temik was utilized.

Irrigated Bt Transgenic Cotton Cost Comparison – 1996-01[1]
A.L. Hutson

		Bt Transgenic		Conventional
Return				
Cotton @ $.575	1,110#	$ 610.50	961#	$ 528.55
Operating Inputs				
Seed	15# @ 1.20	$ 15.30		$ 15.30
Bt Cost		30.30		---
Hoeing		15.00		15.00
Herbicide		8.00		8.00
Nitrogen		24.88		24.88
Phosphorous		6.00		6.00
Ginning		33.30		28.83
Harvest Aid		27.95		27.95
Spraying[2]		19.55		23.18
Crop Insurance		20.00		20.00
Custom Harvest		99.90		86.49
Labor		22.75		22.75
Fuel, Lube & Repair		22.00		22.00
Boll Weevil		18.60		17.11
Irrigation		40.00		40.00
Operating Interest		8.15		7.08
Total Operating Cost		$ 411.68		$ 364.57
Return to Land, overhead, Risk & Management		$198.82		$ 163.98

[1] Based on 5 years of replicated data for 73 trials.
[2] Average spraying of .3/acre for Bt transgenic and .59/acre for conventional bollworm and 2.44 sprays/acre for other sprays on Bt transgenic and 2.43 sprays/acre for conventional. Bollworm cost @ $12.50/spray and other sprays @ $6.50/spray.

Bt Transgenic Variety Demonstration 2001

Cooperator: Terry White
Location: Harmon County

Planting Date: May 14, 2001
Seeding Rate: 17.6 lbs/acre

Heat units accumulated: 2,804

Pesticide Usage:
Roundup (1 qt./acre) over-the-top application: May 20, 2001
Pix (10oz) aerially applied August 8, 2001
5 OBWEO Malathion applications

Harvest Aid applied: October 4, 2001
Finish (8oz) + Prep (8oz) + Ginstar (2oz)

Table 1. Stand Densities, Retention Rates, and Lint Production White's Farm - Summer 2001.

Variety	Stand Density plants/acre		% Retention		Lint (lbs/acre)
	5/25	5/31	7/16	7/31	10/14/01
DP 655 BRR	44,000	43,000	95.8	92.2	1,662.8
Stoneville 4892 BR	36,000	41,000	96.1	93.2	1,648.4
DP 458 BRR	41,000	41,000	94.3	92.1	1,599.2
PM 1560 BG/RR	41,000	40,000	96.4	94.6	1,563.2
PM 2280 BG/RR	40,000	42,000	94.6	93.8	1,330.2
PM 1218 BG/RR	57,000	42,000	95.6	91.5	1,247.9
DP 5415 RR	41,000	41,000	95.8	90.1	1,198.7

Trial Comments:
Insect pressure was non-existent in 2001. DP 655 BRR produced 1662 lbs lint per acre followed by Stoneville 4892 BR 1,648 lbs and DP 458 BRR 1,599 lbs respectively. All Bt transgenic varieties produced greater yields than DP 5415 RR compensating for the technology rental fee.

Bollworm Economic Threshold Study - Bt Transgenic – Irrigated Test

	Stand Count	Plant Height (inches)	Plant Height (inches)	1st Fruiting site (node)	% Fruit Retention	NAWF	NAWF	Bollworm Square Damage	Yield	Yield Difference
Treatment	Plants/acre	/5 plants	/5 plants	/5 plants	/5 plants	/5 plants	/5 plants	/100 Plants	Lbs/acre	Lbs/acre
	June 13	July 26	Aug 17	July 26	Aug 17	Jul 26	Aug 17	Aug 13	Oct 12	Oct 12
NuCOTN 33B	28,000.0	22.67	30.3	7.40	91.67	6.73	2.33	0.0b	780.16	76.81
DP 5415	27,666.7	24.00	30.7	7.53	89.97	7.47	1.33	0.0b	856.97	
PM 2280 BG/RR	29,666.7	21.07	31.0	7.20	90.33	7.20	2.00	13.0a	804.21	49.74
PM 280	30,666.7	22.93	31.3	7.27	92.13	7.53	1.67	0.0b	754.47	
PM 2326BG	30,666.7	23.93	31.3	7.67	90.20	7.07	1.67	0.0b	705.73	72.79
PM HS-26	27,333.3	21.87	30.7	7.27	89.60	7.93	1.73	0.0b	778.52	
DP 237B	31,666.7	22.53	32.3	6.33	90.07	6.80	1.73	0.0b	886.73	11.53
DP 2379	37,333.3	22.60	31.3	7.67	90.50	7.33	1.80	3.0b	898.26	
LSD (P=.05)	8024.72	2.638	2.36	1.391	4.729	0.931	1.268	0.52	199.981	
Standard Dev	4581.93	1.506	1.35	0.794	2.7	0.532	0.724	30.0	114.184	
CV	15.08	6.64	4.33	10.9	2.98	7.32	40.59	143.43	14.13	
Grand Mean	30375	22.7	31.13	7.29	90.56	7.26	1.78	2.10	808.13	

Trial Comments:
Heliothine pressure did not materialized in 2001 preventing initiation of planned treatments. No significant differences in yields occurred between varieties. Lint production ranged from 705 lbs per acre for PM 2326 BR to 898 lbs per acre for DP 237. Three of the four Bt transgenic varieties did not meet or exceed yields of its parent variety.

SITE DESCRIPTION

Variety: Various
Planting Date: May-15-01
Planting Method: Bedded
Rate: 14.1 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 77 F
Soil Moisture: none

SOIL DESCRIPTION

Texture: Clay loam pH: 8.1 Soil Name: Tillman & Hollister Fertility Level: good

MOISTURE CONDITIONS

On: Date	Amount Unit Type	On: Date	Amount Unit Type
1.May-18-01	0.93 IN rain	11.Aug-18-01	1.57 IN rain
2.May-19-01	2.12 IN rain	12.Aug-25-01	0.25 IN rain
3.May-20-01	0.79 IN rain	13.Aug-26-01	1.64 IN rain
4.May-27-01	0.98 IN rain	14.Jul-02-01	4.00 IN irrigation
5.Jun-13-01	0.27 IN rain	15.Jul-13-01	4.00 IN irrigation
6.Jun-15-01	0.04 IN rain	16.Jul-24-01	4.00 IN irrigation
7.Jul-05-01	0.98 IN rain	17.Aug-02-01	4.00 IN irrigation
8.Jul-16-01	0.46 IN rain	18.Aug-14-01	4.00 IN irrigation
9.Aug-10-01	0.48 IN rain	19.Aug-23-01	4.00 IN irrigation
10.Aug-12-01	0.59 IN rain		

Overall Moisture Conditions: Fair
Closest Weather Station: Altus Mesonet Distance: .5 Unit: mile

APPLICATION DESCRIPTION

Application Date:	May-15-01	May-25-01	Jun-01-01	Jul-28-01	Oct-02-01
Time of Day:	PM	AM	AM	AM	AM
Application Method:		SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:		PREBLO	PREBLO	PREBLO	PREHARV
Applic. Placement:		BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	85 F	65 F	61 F	97 F	66 F
% Relative Humidity:	45	38	96	29	48
Wind Velocity, Unit:	22 mph	4 mph	4 mph	6 mph	0 mph
Dew Presence (Y/N):	n	n	n	n	n
Water Hardness:	none	none	none	none	none
Soil Temp., Unit:	79 F	62 F	89 F	94 F	65 F
Soil Moisture:	poor	excellent	excellent	good	averagae
% Cloud Cover:	0	0	100	0	0

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2	CO 2	CO 2	CO 2
Operating Pressure:		50 psi	50 psi	50 psi	50 psi
Nozzle Type:		cone	cone	cone	cone
Nozzle Size:		TX 7	TX 7	TX 7	TX7
Nozzle Spacing, Unit		20 inch	20 inch	20 inch	20 inch
Nozzles/Row:		2	2	2	2
Ground Speed, Unit:	4 mph	4 mph	4 mph	4 mph	4 mph
Carrier:		water	water	water	water
Spray Volume, Unit:		10 GPA	10 GPA	10 GPA	10 GPA
Propellant:		CO 2	CO 2	CO 2	CO 2

Influence of Steward And Tracer Applications to Enhance Insect Protection in Bt Cotton

	Stand Count	Plant Height (inches)	Plant Height (inches)	1st Fruiting site (node)	% Fruit Retention	NAWF	NAWF	Bollworm Square Damage	Yield	Yield Difference
Treatment	Plants/acre	/5 plants	/5 plants	/5 plants	/5 plants	/5 plants	/5 plants	/100 Plants	Lbs/acre	Lbs/acre
	June 13	July 26	Aug 16	July 26	Aug 17	Jul 26	Aug 17	Aug 13	Oct 12	Oct 12
DP 33B untreated	32,000.00	24.07	30.7	7.87	90.90	7.27	2.00	0.0	1,224.70a	242.53
DP 5415 untreated	24,666.70	23.00	30.3	7.60	90.63	7.40	1.40	0.0	982.17 b	
LSD (P=.05)	12421.69	3.525	3.79	3.525	1.589	1.518	1.315	0.0	218.437	
Standard Deviation	3535.53	1.003	1.08	1.003	0.452	0.432	0.74	0.0	62.173	
CV	11.98	4.26	3.54	12.97	0.5	5.89	22.01	0.0	5.63	
Grand Mean	29500	23.53	30.5	7.73	90.77	7.33	1.7	0.0	1103.44	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Trial Comments:
Heliothine pressure did not materialized in 2001 preventing over spray of either variety DP 33 B or DP 5415 with Steward or Tracer. Yields were significantly different between varieties with DP 33 B out producing DP 5415 by 242 lbs lint/acre easily compensating for the technology rental fee.

SITE DESCRIPTION

Variety: Various
Planting Date: May-15-01
Planting Method: Bedded
Rate: 14.1 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 77 F
Soil Moisture: none

SOIL DESCRIPTION

Texture: Clay loam pH: 8.1 Soil Name: Tillman & Hollister Fertility Level: good

MOISTURE CONDITIONS

On: Date	Amount Unit Type	On: Date	Amount Unit Type
1.May-18-01	0.93 IN rain	11.Aug-18-01	1.57 IN rain
2.May-19-01	2.12 IN rain	12.Aug-25-01	0.25 IN rain
3.May-20-01	0.79 IN rain	13.Aug-26-01	1.64 IN rain
4.May-27-01	0.98 IN rain	14.Jul-02-01	4.00 IN irrigation
5.Jun-13-01	0.27 IN rain	15.Jul-13-01	4.00 IN irrigation
6.Jun-15-01	0.04 IN rain	16.Jul-24-01	4.00 IN irrigation
7.Jul-05-01	0.98 IN rain	17.Aug-02-01	4.00 IN irrigation
8.Jul-16-01	0.46 IN rain	18.Aug-14-01	4.00 IN irrigation
9.Aug-10-01	0.48 IN rain	19.Aug-23-01	4.00 IN irrigation
10.Aug-12-01	0.59 IN rain		

Overall Moisture Conditions: Fair
Closest Weather Station: Altus Mesonet Distance: .5 Unit: mile

APPLICATION DESCRIPTION

Application Date:	May-15-01	May-25-01	Jun-01-01	Jul-28-01	Oct-02-01
Time of Day:	PM	AM	AM	AM	AM
Application Method:		SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:		PREBLO	PREBLO	PREBLO	PREHARV
Applic. Placement:		BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	85 F	65 F	61 F	97 F	66 F
% Relative Humidity:	45	38	96	29	48
Wind Velocity, Unit:	22 mph	4 mph	4 mph	6 mph	0 mph
Dew Presence (Y/N):	n	n	n	n	n
Water Hardness:	none	none	none	none	none
Soil Temp., Unit:	79 F	62 F	89 _	94 _	65 F
Soil Moisture:	poor	excellent	excellent	good	average
% Cloud Cover:	0	0	100	0	0

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2	CO 2	CO 2	CO 2	
Operating Pressure:		50 psi	50 psi		50 psi	50 psi
Nozzle Type:		cone	cone	cone	cone	
Nozzle Size:		TX 7	TX 7	TX 7	TX7	
Nozzle Spacing, Unit		20 inch	20 inch	20 inch	20 inch	
Nozzles/Row:		2	2	2	2	
Ground Speed, Unit:	4 mph	4 mph	4 mph	4 mph	4 mph	
Carrier:		water	water	water	water	
Spray Volume, Unit:		10 GPA	10 GPA	10 GPA	10 GPA	
Propellant:		CO 2	CO 2	CO 2	CO 2	

Performance of Bt Transgenic and Parental Varieties – Irrigated Test

	Stand Count	Plant Height (inches)	Plant Height (inches)	1st Fruiting site (node)	% Fruit Retention	NAWF	NAWF	Bollworm Square Damage	Yield	Yield Difference
Treatment	Plants/acre	/5 plants	/5plants	/5plants	/5plants	/5 plants	/5plants	/100 Plants	Lbs/acre	Lbs/acre
	June 13	July 25	Aug 17	July25	Aug 17	Jul 25	Aug 6	Aug 13	Oct 12	Oct 12
DP 33B	26,000.0	23.33	30.0	7.3	92.86	5.93	1.67	0.0	1,020.73ab	-17.21
DP 5415	**29,666.7**	**23.33**	**31.0**	**7.0**	**88.36**	**5.47**	**2.00**	**3.0**	**1,037.94ab**	
DP 458 B/RR	32,000.0	21.73	30.7	7.3	92.00	5.20	1.00	3.0	1,083.05ab	-26.55
DP 5415	**33,000.0**	**22.80**	**32.0**	**6.7**	**91.96**	**5.00**	**0.67**	**0.0**	**1,109.60ab**	
DP 35B	33,666.7	23.27	31.3	7.0	90.20	6.00	1.33	0.0	1,182.08ab	-69.07
DP 5690	**36,000.0**	**22.33**	**30.7**	**7.0**	**88.00**	**5.80**	**1.73**	**0.0**	**1,113.01ab**	
DP 655 B/RR	33,000.0	21.47	30.7	7.3	91.19	5.40	1.73	3.0	1,126.81ab	-37.65
DP 5690	**37,000.0**	**23.00**	**32.0**	**6.7**	**89.73**	**5.67**	**2.00**	**0.0**	**1,164.46ab**	
DP 237 B	33,000.0	23.40	32.0	7.0	89.03	5.87	1.07	0.0	844.29 ab	81.12
DP 2379	**35,000.0**	**23.27**	**31.0**	**7.0**	**91.23**	**4.93**	**2.00**	**0.0**	**763.17b**	
PM 2326 BG/RR	37,333.3	23.20	31.0	7.0	90.16	5.00	1.67	0.0	676.12b	-11.52
PM HS-26	**35,000.0**	**22.27**	**31.3**	**7.0**	**90.53**	**5.87**	**1.67**	**0.0**	**687.64b**	
PM 2280 BG/RR	35,333.3	22.53	32.0	7.3	89.69	5.73	1.33	3.0	786.02b	85.81
PM 280	**33,333.3**	**22.13**	**30.3**	**6.7**	**88.86**	**4.87**	**2.33**	**0.0**	**700.21b**	
Sure Grow 501B	38,666.7	23.53	30.7	7.7	90.86	5.47	2.00	0.0	1,079.53ab	97.86
SureGrow 501	**26,333.3**	**22.40**	**32.0**	**8.0**	**90.96**	**6.53**	**1.67**	**7.0**	**981.67ab**	
ST 4691B	23,233.3	23.00	31.3	6.3	90.33	5.13	2.47	0.0	992.78ab	-124.11
ST 474	**29,666.7**	**22.93**	**31.0**	**6.7**	**89.89**	**5.13**	**1.53**	**0.0**	**1,116.89ab**	
ST 4892B	30,000.0	22.67	31.7	7.3	90.53	5.47	1.33	0.0	1,360.35a	381.61
ST 474	**28,666.7**	**23.13**	**32.0**	**7.0**	**89.33**	**5.40**	**2.00**	**3.0**	**978.74ab**	
LSD (P=.05)	10716.66	2.467	1.69	1.28	3.72	0.963	1.191	0.53	303.215	
Standard Deviation	10716.66	1.495	1.03	0.78	3.72	0.584	0.722	0.32	183.751	
CV	10716.66	6.56	3.28	10.99	3.72	10.62	43.48	276.93	18.56	
Grand Mean	10716.66	22.79	31.23	7.07	3.72	5.49	1.66	1.20	990.26	

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Variety – Parent variety

Trial Comments:
Heliothine pressure did not materialize in 2001. Stoneville 4892 BR produced 1,360 lbs lint per acre which was significantly different from PM 2326 BR - 676 lbs lint per acre, PM HS-26 - 687 lbs lint per acre, PM 2280 BR - 786 lbs lint per acre, and PM 280 - 700 lbs lint per acre. Five of the nine Bt transgenic varieties failed to meet or exceed yields of their parental varieties.

SITE DESCRIPTION

Variety: Various
Planting Date: May-15-01
Planting Method: Bedded
Rate: 14.1 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 77 F
Soil Moisture: none

SOIL DESCRIPTION

Texture: Clay loam pH: 8.1 Soil Name: Tillman & Hollister Fertility Level: good

MOISTURE CONDITIONS

On: Date	Amount	Unit	Type	On: Date	Amount	Unit	Type
1.May-18-01	0.93	IN	rain	11.Aug-18-01	1.57	IN	rain
2.May-19-01	2.12	IN	rain	12.Aug-25-01	0.25	IN	rain
3.May-20-01	0.79	IN	rain	13.Aug-26-01	1.64	IN	rain
4.May-27-01	0.98	IN	rain	14.Jul-02-01	4.00	IN	irrigation
5.Jun-13-01	0.27	IN	rain	15.Jul-13-01	4.00	IN	irrigation
6.Jun-15-01	0.04	IN	rain	16.Jul-24-01	4.00	IN	irrigation
7.Jul-05-01	0.98	IN	rain	17.Aug-02-01	4.00	IN	irrigation
8.Jul-16-01	0.46	IN	rain	18.Aug-14-01	4.00	IN	irrigation
9.Aug-10-01	0.48	IN	rain	19.Aug-23-01	4.00	IN	irrigation
10.Aug-12-01	0.59	IN	rain				

Overall Moisture Conditions: Fair
Closest Weather Station: Altus Mesonet Distance: .5 Unit: mile

APPLICATION DESCRIPTION

Application Date:	May-15-01	May-25-01	Jun-01-01	Jul-28-01	Oct-02-01
Time of Day:	PM	AM	AM	AM	AM
Application Method:		SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:		PREBLO	PREBLO	PREBLO	PREHARV
Applic. Placement:		BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	85 F	65 F	61 F	97 F	66 F
% Relative Humidity:	45	38	96	29	48
Wind Velocity, Unit:	22 mph	4 mph	4 mph	6 mph	0 mph
Dew Presence (Y/N):	n	n	n	n	n
Water Hardness:	none	none	none	none	none
Soil Temp., Unit:	79 F	62 F	89 F	94 F	65 F
Soil Moisture:	poor	excellent	excellent	good	average
% Cloud Cover:	0	0	100	0	0

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2	CO 2	CO 2	CO 2	
Operating Pressure:		50 psi	50 psi	50 psi	50 psi	50 psi
Nozzle Type:		cone	cone	cone	cone	
Nozzle Size:		TX 7	TX 7	TX 7	TX7	
Nozzle Spacing, Unit		20 inch	20 inch	20 inch	20 inch	
Nozzles/Row:		2	2	2	2	
Ground Speed, Unit:	4 mph	4 mph	4 mph	4 mph	4 mph	
Carrier:		water	water	water	water	
Spray Volume, Unit:		10 GPA	10 GPA	10 GPA	10 GPA	
Propellant:		CO 2	CO 2	CO 2	CO 2	

Performance of Picker and Stripper Bt Transgenic Varieties – Irrigated Test

	Stand Count	Plant Height (inches)	Plant Height (inches)	1st Fruiting site (node)	% Fruit Retention	NAWF	NAWF	Bollworm Square Damage	Yield
Treatment	Plants/acre	/5 plants	/5 plants	/5 plants	/5 plants	/5 plants	/5 plants	/100 Plants	Lbs/acre
	June 22	July 25	Aug 16	July 25	Aug 17	Jul 25	Aug 16	Aug 13	Oct 12
DP 35B	29,000.0 ab	22.53	30.7	7.67	88.60bc	7.07	1.67	0.0	1,369.52
DP 655 B/RR	28,333.3 ab	21.13	31.0	6.93	92.03abc	6.73	1.33	0.0	1,356.18
ST 4691 B	29,666.7 ab	22.67	31.3	6.87	89.53abc	7.13	1.73	0.0	1,340.62
ST 4892 BR	26,333.3 ab	21.67	31.3	7.20	92.53ab	7.60	1.67	0.0	1,228.90
PM 1560 BG/RR	28,333.3 ab	23.00	30.7	7.93	92.40ab	7.60	1.80	0.0	1,119.41
SG 501 B/R	34,333.3 ab	21.93	32.3	6.93	87.33c	7.13	1.73	0.0	1,046.46
DP 458B/RR	27,333.3ab	22.20	31.3	7.33	93.06a	7.27	1.33	0.0	959.71
DP 237B	26,666.7 ab	21.47	31.3	7.47	90.00abc	7.73	1.00	0.0	942.44
PM 1218 BG/RR	26,666.7 ab	22.87	32.0	8.13	89.16abc	7.07	1.67	0.0	898.68
PM 2280 BG/RR	32,333.3 ab	22.33	31.0	7.40	90.39abc	7.13	1.67	0.0	842.88
DP 33B	26,000.0 b	23.47	30.0	7.27	90.93abc	7.27	2.00	0.0	829.37
PM 2326 BG/RR	37,666.7a	24.40	31.0	7.73	89.66abc	6.87	1.33	0.0	793.19
LSD (P=.05)	6640.31	2.803	1.99	1.608	2.426293	1.075	1.193	0.0	271.931
Standard Deviation	3921.26	1.655	1.18	0.949	1.432782	0.635	0.705	0.0	160.582
CV	13.34	7.37	3.78	12.82	1.58	8.79	44.66	0.0	15.14
Grand Mean	29388.89	22.47	31.17	7.41	90.47	7.22	1.58	0.0	1060.61

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Trial Comments:

Heliothine pressure did not materialize in 2001. There were no significant differences in yield. As a whole, picker varieties out performed stripper varieties. DP 35 B was top yielder producing 1,256 lbs. lint per acre followed by DP 655 BRR – 1,356 lbs. lint per acre, and Stoneville 4691 B - 1,340 lbs. lint per acre.

SITE DESCRIPTION

Variety: Various
Planting Date: May-15-01
Planting Method: Bedded
Rate: 14.1 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 77 F
Soil Moisture: none

SOIL DESCRIPTION

Texture: Clay loam pH: 8.1 Soil Name: Tillman & Hollister Fertility Level: good

MOISTURE CONDITIONS

On: Date	Amount	Unit	Type	On: Date	Amount	Unit	Type
1.May-18-01	0.93	IN	rain	11.Aug-18-01	1.57	IN	rain
2.May-19-01	2.12	IN	rain	12.Aug-25-01	0.25	IN	rain
3.May-20-01	0.79	IN	rain	13.Aug-26-01	1.64	IN	rain
4.May-27-01	0.98	IN	rain	14.Jul-02-01	4.00	IN	irrigation
5.Jun-13-01	0.27	IN	rain	15.Jul-13-01	4.00	IN	irrigation
6.Jun-15-01	0.04	IN	rain	16.Jul-24-01	4.00	IN	irrigation
7.Jul-05-01	0.98	IN	rain	17.Aug-02-01	4.00	IN	irrigation
8.Jul-16-01	0.46	IN	rain	18.Aug-14-01	4.00	IN	irrigation
9.Aug-10-01	0.48	IN	rain	19.Aug-23-01	4.00	IN	irrigation
10.Aug-12-01	0.59	IN	rain				

Overall Moisture Conditions: Fair
Closest Weather Station: Altus Mesonet Distance: .5 Unit: mile

APPLICATION DESCRIPTION

Application Date:	May-15-01	May-25-01	Jun-01-01	Jul-28-01	Oct-02-01
Time of Day:	PM	AM	AM	AM	AM
Application Method:		SPRAY	SPRAY	SPRAY	SPRAY
Application Timing:		PREBLO	PREBLO	PREBLO	PREHARV
Applic. Placement:		BROFOL	BROFOL	BROFOL	BROFOL
Air Temp., Unit:	85 F	65 F	61 F	97 F	66 F
% Relative Humidity:	45	38	96	29	48
Wind Velocity, Unit:	22 mph	4 mph	4 mph	6 mph	0 mph
Dew Presence (Y/N):	n	n	n	n	n
Water Hardness:	none	none	none	none	none
Soil Temp., Unit:	79 F	62 F	89 F	94 F	65 F
Soil Moisture:	poor	excellent	excellent	good	average
% Cloud Cover:	0	0	100	0	0

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2	CO 2	CO 2	CO 2
Operating Pressure:		50 psi	50 psi	50 psi	50 psi
Nozzle Type:		cone	cone	cone	cone
Nozzle Size:		TX 7	TX 7	TX 7	TX7
Nozzle Spacing, Unit		20 inch	20 inch	20 inch	20 inch
Nozzles/Row:		2	2	2	2
Ground Speed, Unit:	4 mph	4 mph	4 mph	4 mph	4 mph
Carrier:		water	water	water	water
Spray Volume, Unit:		10 GPA	10 GPA	10 GPA	10 GPA
Propellant:		CO 2	CO 2	CO 2	CO 2

Cotton Fleahopper Insecticide Trial

			Fleahopper	Spiders	Ladybugs	Nabids	Fleahopper	% Control
			June 29	June 29	June 29	June 29	July 2	July 2
Treatment	Rate		Precount	Precount	Precount	Precount	3 DAT	3 DAT
ACTARA	0.0473	LB A/A					2.7 b	82.22 ab
CENTRIC	0.0473	LB A/A					1.0 b	93.52 ab
CENTRIC	0.0625	LB A/A					2.0 b	84.45 ab
ORTHENE	0.25	LB A/A					0.0 b	100.00 a
FULFILL	0.086	LB A/A					2.7b	81.3 ab
DENIM	0.01	LB A/A					5.7 b	58.15 b
Steward	0.11	LB A/A					3.3 b	75.37 ab
Leverage	0.0633	LB A/A					0.0 b	100.0 a
Calypso	0.075	LB A/A					2.7 b	80.55 ab
CHECK			20	0.7	0.7	0.7	15.0 a	0.0 c
LSD (P=.05)			.	.	.	.	3.42	22.774
Standard Deviation			.	.	.	.	1.99	13.276
CV			.	.	.	.	56.96	17.57
Grand Mean			20	0.67	0.67	0.67	3.50	75.56

			Spiders	Ladybugs	Nabids	Collops	Aphid	FChinch
			July 2	July 2	July 2	July 2	July 2	July 2
Treatment	Rate		3 DAT	3 DAT	3 DAT	3 DAT	3 DAT	3 DAT
ACTARA	0.0473	LB A/A	0.3	0.0	1.0	0.0	0.0	1.0
CENTRIC	0.0473	LB A/A	0.0	0.3	0.0	0.7	0.0	0.3
CENTRIC	0.0625	LB A/A	1.3	0.0	0.3	0.7	0.0	1.0
ORTHENE	0.25	LB A/A	0.0	0.0	0.0	0.0	0.7	0.0
FULFILL	0.086	LB A/A	1.0	0.0	0.0	0.0	0.0	1.0
DENIM	0.01	LB A/A	0.0	0.0	0.0	0.0	0.0	0.0
Steward	0.11	LB A/A	0.0	0.0	0.0	0.0	0.0	1.0
Leverage	0.0633	LB A/A	0.0	0.0	0.0	0.0	0.0	0.0
Calypso	0.075	LB A/A	0.0	0.0	0.0	0.0	0.0	0.7
CHECK			1.0	0.3	1.7	1.0	0.0	0.0
LSD (P=.05)			1.22	0.46	1.79	1.15	0.63	1.35
Standard Deviation			0.71	0.27	1.04	0.67	0.37	0.79
CV			193.56	397.91	347.24	286.9	547.72	157.29
Grand Mean			0.37	0.07	0.3	0.23	0.07	0.5

Trial Comments:

Pre-treatment cotton fleahopper numbers were 20 (adults and nymphs) per 10 sweeps on June 29, 2001 when insecticides were applied. All insecticides were significantly different than the untreated check - 15 per 10 sweeps (3DAT). All insecticides except Demin .01lbs A.I. per acre (58.75%) provided control than exceeded 75%. Beneficial insect numbers were low and there were no significant difference between treatments (3DAT). Due to decline in cotton fleahopper numbers in the untreated – 3.3 per 10 sweeps the test was terminated. Yield data was not taken.

SITE DESCRIPTION

Variety: Various
Planting Date: May-15-01
Planting Method: Bedded
Rate: 14.1 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 77 F
Soil Moisture: none

SOIL DESCRIPTION

Texture: Clay loam pH: 8.1 Soil Name: Tillman & Hollister
Fertility Level: good

APPLICATION DESCRIPTION

Application Date:	May-15-01	June-29-01
Time of Day:	PM	AM
Application Method:		SPRAY
Application Timing:		PREBLO
Applic. Placement:		BROFOL
Air Temp., Unit:	85 F	81 F
% Relative Humidity:	45	58
Wind Velocity, Unit:	22 mph	8 mph
Dew Presence (Y/N):	n	n
Water Hardness:	none	none
Soil Temp., Unit:	79 F	79 F
Soil Moisture:	poor	poor
% Cloud Cover:	0	0

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2
Operating Pressure:		50 psi
Nozzle Type:		cone
Nozzle Size:		TX 7
Nozzle Spacing, Unit		20 inch
Nozzles/Row:		2
Ground Speed, Unit:	4 mph	4 mph
Carrier:		water
Spray Volume, Unit:		10 GPA
Propellant:		CO 2

Performance of Bt Transgenic and Parent Varieties – Dryland Test

	Stand Count	Plant height (Inches)	1st Fruiting site (node)	% Fruit Retention	NAWF	Yield	Yield Difference
Treatment	Plants/acre	/5 plants	/5 plants	/5 plants	/5 Plants	Lbs/acre	Lbs/acre
	June 11	July 17	July 17	July 17	July 17	Oct 18	Oct 18
DP 237 B	38,666.7	15.0	6.3	50.0	0.3	105.21	3.24
PARENT DP 2379	32,000.0	13.7	6.7	50.7	1.0	101.97	
PM 2326 BG/RR	37,000.0	14.3	6.7	52.7	1.0	102.84	-8.69
PARENT PM HS-26	39,000.0	14.7	6.3	51.3	0.7	111.53	
PM 2280 BG/RR	36,666.7	15.0	6.0	51.0	1.0	131.11	9.10
PARENT PM 280	37,000.0	15.7	7.7	52.0	1.0	122.01	
LSD (P=.05)	6094.09	1.75	1.03	190.5	0.81	35.986	
Standard Deviation	3349.96	0.96	0.57	104.72	0.45	19.782	
CV	9.12	6.52	8.59	137.89	53.67	17.59	
Grand Mean	36722.22	14.72	6.61	75.94	0.83	112.44	

Trial Comments:
Heliothine pressure did not materialize in 2001. Hot, dry conditions dominate throughout the summer retarding plant development and lint production. There were no significant differences in yields. Bt transgenic varieties failed to compensate for technology fees increasing the monetary loss experienced.

SITE DESCRIPTION

Variety: Various
Planting Date: May-9-01
Planting Method: Bedded
Rate: 12.9 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 74 F
Soil Moisture: excellent

SOIL DESCRIPTION

Texture: silt loam pH: 8.1 Soil Name: Tipton Silt Loam Fertility Level: good

MOISTURE CONDITIONS

On: Date	Amount	Unit	Type	On: Date	Amount	Unit	Type
1.May-11-01	0.83	IN	rain	11.Aug-13-01	0.27	IN	rain
2.May-18-01	0.72	IN	rain	12.Aug-17-01	1.35	IN	rain
3.May-19-01	1.66	IN	rain	13.Aug-18-01	0.25	IN	rain
4.May-20-01	0.82	IN	rain	14.Aug-25-01	0.28	IN	rain
5.May -27-01	0.86	IN	rain	15. Sept-13-01	1.03	IN	rain
6.May 29-01	0.85	IN	rain	16. Sept-15-01	1.85	IN	rain
7.Jun-12 -01	0.13	IN	rain				
8.Jun-24-01	0.15	IN	rain				
9.Aug-9-01	0.30	IN	rain				
10.Aug-12-01	0.17	IN	rain				

Overall Moisture Conditions: poor
Closest Weather Station: Tipton Mesonet Distance: 50 Unit: yards

APPLICATION DESCRIPTION

Application Date:	May-9-01	May-24-01
Time of Day:	PM	AM
Application Method:		SPRAY
Application Timing:		PREBLO
Applic. Placement:		BROFOL
Air Temp., Unit:	84 F	61 F
% Relative Humidity:	40	38
Wind Velocity, Unit:	16 mph	4 mph
Dew Presence (Y/N):	n	n
Water Hardness:	none	none
Soil Temp., Unit:	74 F	68 F
Soil Moisture:	poor	excellent
% Cloud Cover:	0	0

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2
Operating Pressure:		50 psi
Nozzle Type:		cone
Nozzle Size:		TX 7
Nozzle Spacing, Unit		20 inch
Nozzles/Row:		2
Ground Speed, Unit:	4 mph	4 mph
Carrier:		water
Spray Volume, Unit:		10 GPA
Propellant:		CO 2

Impact of Planting Date and Different Insect Control Strategies on Dryland Production

	Stand Count	Plant height (inches)	1st Fruiting site (node)	% Fruit Retention	Bollworm Square Damage	Yield
Treatment	Plants/acre	/5 plants	/5 plants	/5 plants	/100 Plants	Lbs/acre
	June 18	July 17	July 17	July 17	July 17	Oct 18
Paymaster HS-26	29,666.7	20.3	6.3 ab	50.7	0.0	145.30 a
Planted June 4						
Untreated						
Paymaster HS-26	31,666.7	19.0	7.7 a	47.3	0.0	117.26 b
Planted June 4						
Vydate Pinhead 7/13						
Paymaster 280	29,666.7	22.0	6.0 b	47.7	0.0	152.21 a
Planted June 4						
Untreated						
Paymaster 280	29,666.7	16.0	6.3 ab	50.7	0.0	106.43 b
Planted June 4						
Vydate Pinhead 7/13						
LSD (P=.05)	28,83.82	3.05	1.1	5.85	0.0	23.042
Standard Deviation	1443.38	1.53	0.55	2.93	0.0	11.533
CV	4.78	7.9	8.4	5.97	0.0	8.85
Grand Mean	30166.67	19.33	6.58	49.08	0.0	130.3

Trial Comments:
Only the June 4th planting survived, but hot, dry conditions retarded plant development and lint production. There were no significant differences in yields. Overwintering sprays of Vydate .125 lbs AI/acre did not increase yields in either variety.

SITE DESCRIPTION

Variety: Various
Planting Date: June-4-01
Planting Method: Bedded
Rate: 12.9 lbs/acre Depth: 0.5 in
Perennial Age: 0.5 year
Row Spacing: 40 inch Seed Bed: cloddy dry
Soil Temperature: 74 F
Soil Moisture: excellent

SOIL DESCRIPTION

Texture: silt loam pH: 8.1 Soil Name: Tipton Silt Loam
Fertility Level: good

MOISTURE CONDITIONS

On: Date	Amount Unit Type	On: Date	Amount Unit Type
1. Jun-12 -01	0.13 IN rain	6. Aug-17-01	1.35 IN rain
2. Jun-24-01	0.15 IN rain	7. Aug-18-01	0.25 IN rain
3. Aug-9-01	0.30 IN rain	8. Aug-25-01	0.28 IN rain
4. Aug-12-01	0.17 IN rain	9. Sept-13-01	1.03 IN rain
5. Aug-13-01	0.27 IN rain	10. Sept-15-01	1.85 IN rain

Overall Moisture Conditions: poor
Closest Weather Station: Tipton Mesonet
Distance: 50 Unit: yards

APPLICATION DESCRIPTION

Application Date:	June-4-01	July-13-01
Time of Day:	PM	PM
Application Method:		SPRAY
Application Timing:		PREBLO
Applic. Placement:		BROFOL
Air Temp., Unit:	98 F	79 F
% Relative Humidity:	48	78
Wind Velocity, Unit:	26 mph	2 mph
Dew Presence (Y/N):	n	n
Water Hardness:	none	none
Soil Temp., Unit:	81 F	89 F
Soil Moisture:	poor	poor
% Cloud Cover:	0	40

APPLICATION EQUIPMENT

Appl. Equipment:	JD 7100	CO 2
Operating Pressure:		50 psi
Nozzle Type:		cone
Nozzle Size:		TX 7
Nozzle Spacing, Unit		20 inch
Nozzles/Row:		2
Ground Speed, Unit:	4 mph	4 mph
Carrier:		water
Spray Volume, Unit:		10 GPA
Propellant:		CO 2

CONTROL OF GARDEN WEBWORM LARVAE IN ALFALFA, 2001

Garden webworm (GW): *Achyra ratalis* (Guenee)

Seven chemical insecticide treatments were evaluated for efficacy in controlling GW larvae infesting the third crop of a fourth year stand of 'Cimmaron' alfalfa. Pre-treatment samples revealed an infestation of 12.67 GW larvae/5 stems. Insecticides were applied on 31Aug using a pressurized bicycle sprayer calibrated to deliver 10 gpa at 18 psi through six, 80015VS flat fan nozzles traveling at 3 mph. Treatments were arranged in RCB design using plots 10 x 50 ft in size, replicated 3 times. Efficacy was determined by sampling 4 DAT by pulling 5 stems per plots and carefully inspecting individual stems for larvae.

Weather conditions after treatment were ideal for insecticide activity with no rainfall and a mean daily high temperature of 89ºF. 4 DAT counts revealed a drop in larval numbers in the untreated check. This reduction was due to larvae beginning to pupae. Warrior T provided significantly better GW control than Lannate, Steward, Tracer, Intrepid, and Confirm. Average GW control ranged from 64.88% (Confirm) to 100% (Warrior T).

		No. GW larvae/5 stems		
	Rate			Avg. %
Treatment	lb(AI)/acre	Pre-count	4 DAT	Control
Untreated check	------		12.67	7.70a
Confirm 2F	0.080		2.70b	64.88
Tracer	0.062		2.00bc	73.81
Intrepid 2F	0.060		2.00bc	73.81
Steward SC	0.090		1.70bc	77.98
Lannate LV	0.220		1.30bc	82.74
Lorsban 4E	0.750		0.70cd	90.48
Warrior T	0.025		0.00d	100.00

Means within column, followed by the same letter are not significantly different (P=0.05, LSD).


OSU
Extension Entomology
Planting Date
Heat Units Accumulated
Growth Stage
MAY 14
2,441
DEFOLIATION
cotton
COTTON INCORPORATED