





TEXAS A&M AGRILIFE EXTENSION

Nueces County

Part 1

2012

RESULTS OF AGRICULTURE DEMONSTRATIONS & APPLIED RESEARCH PROJECTS

Texas A&M AgriLife Extension Service, Dr. Doug Steele, Director, The Texas A&M University System, College Station, Texas

Extension provides practical education you can trust to help people, businesses and communities solve problems, develop skills, and build a better future.

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TEXAS A&M
AGRILIFE
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Office of Nueces County

TEXAS A&M AGRILIFE EXTENSION

FOREWORD

This publication was produced for Coastal Bend agricultural producers by the Nueces County Extension Office and contains results of demonstrations and applied research projects planned by the Agriculture and Natural Resources Committee with cooperating farmers and ranchers. The support provided by cooperators, Texas A&M AgriLife Extension Service specialist staff and research scientists of Texas A&M AgriLife Research and private industry was essential for the completion of this book and is greatly appreciated.

Weather is always a major factor that determines the final outcome of many Agriculture related issues as was the case in 2012. We started the year out with very little stored soil moisture from 2011 and got some early rains, but after the crops emerged, rainfall became very limited. A significant number of cotton and grain sorghum acres failed, as did many of our test plots. Needless to say, it was a very disappointing year. Livestock producers faced a disappearing standing forage supply on rangeland resulting in high feed bills and destocking.

The demonstration and applied research projects were conducted to provide information to the local Ag industry on the performance of certain new agricultural technologies and management practices under Nueces County growing conditions.

Many results reported in this book are based on only one year's data. It should be remembered that different growing conditions might produce different results. Results obtained from a three too five-year period are more reliable and should be used as a bias for making a complete change from normal production or management practices.

Any references made to commercial products or trade names were made solely for educational purposes with the understanding that neither endorsement nor discrimination is implied by the Texas A&M AgriLife Extension Service or its agents.

It is my hope that information contained within this document might be put to use to enhance the performance of agricultural enterprises in the Coastal Bend of Texas.

Jeffrey R. Stapper
County Extension Agent
Texas A&M AgriLife Extension Service
Agriculture & Natural Resources
Nueces County

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AGRICULTURAL RESULT DEMONSTRATIONS

"Planning, Implementing and Evaluating"

For over 100 years "result demonstrations" have been one of the most effective educational methods used by County Extension Agents to encourage the adoption of research based knowledge by local farmers and ranchers. The result demonstration is a well planned trial that measures the benefits derived from the use of a given practice under local conditions. Demonstration trials are an effective means of evaluating the benefits of new crop protection chemicals, improvements in planting seed genetics and other technological advancements.

Result demonstrations are not conducted without a purpose or need. They are the basis for the County Extension educational program efforts directed at local problems and providing a stronger data base for agricultural decision making.

The citizens who serve on the various Extension program area committees are largely responsible for identifying problem areas. Committees made up of individuals involved in various phases of agriculture, willingly volunteer their time and talents. These committees are responsible for giving direction to the Extension program effort and for identifying problem areas that need to be addressed through result demonstrations or other methods.

The Nueces County Agricultural Extension Agents greatly appreciate the assistance provided by the members of the Agriculture & Natural Resources Committee, Field Crops Task Force and Livestock Task Force committees. Without their support and direction and the involvement of the cooperators, the demonstration results reported in this publication would not have been possible.

AGRICULTURE & NATURAL RESOURCES COMMITTEE MEMBERS

Jimmy Dodson	Scott Frazier	John Freeman
Ruben Garza	Jon Herrmann	Darrell Lawhon
David Mayo	Mark Miller	

FIELD CROPS TASK FORCE MEMBERS

David Mayo	Jimmy Dodson	Russell Jungmann
Larry McNair	Jon Gwynn	Jim Massey, IV
Mark Miller	David Ocker	John Freeman
Darrell Lawhon	Scott Ordner	

LIVESTOCK TASK FORCE MEMBERS

Jon Herrmann	Scott Frazier	Leon Little	Ruben Garza

ACKNOWLEDGEMENTS

We wish to acknowledge those who contributed products or services to the success of these demonstrations. We greatly appreciate their support. Individual cooperators are acknowledged in the introduction of each demonstration report. The support provided by the members of the Extension Leadership Advisory Board, the Field Crops Task Force, Livestock Task Force and Ag & Natural Resources committee are also appreciated. Without the support of the Nueces County Commissioners Court and the County Extension Office staff, these result demonstrations and this handbook would not have been possible. Special thanks to Perry Foundation for their support in making printing of this book possible.

NUECES COUNTY COMMISSIONER'S COURT

County Judge	Loyd Neal
Commissioner Precinct 1	Mike Pusley
Commissioner Precinct 2	Joe A. Gonzalez
Commissioner Precinct 3	Oscar Ortiz
Commissioner Precinct 4	Joe McComb

NUECES COUNTY EXTENSION LEADERSHIP ADVISORY BOARD

Laura Berry	David Mayo	Elias Vasquez	John Freeman
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Frances Morrow	Jimmy Wright	Harvey Buehring	

COOPERATING SEED COMPANIES

All-Tex Seed Co.	P O Box 1057	Levelland, TX 79336
Americot	105 Buck Lane	Georgetown, TX 78628
B-H Genetics	5933 FM 1157	Ganado, TX 77962
Bayer/Fibermax	13557 Carlos 5th Port	Corpus Christi, TX 78418
Cargill Specialty Canola Oils	2300 N Yellowstone Hwy, Suite 122	Idaho Falls, ID 83401
Croplan Genetics	P O 476	Taft, TX 78390
Dreamland Industries LTD.	126 Bacacita Farm. Rd.	Abilene, TX 79602
Dow Agro Sciences	317 West Alice	Kingsville, TX 78383
Delta & Pine Land Seed	4014 Northwood	Corpus Christi, TX 78410
Foundation Seed Service	TAMU	College Station, TX 77841
Gayland Ward Seeds	1900 Pease St, Ste 305	Vernon, TX 76384
Golden Acres	905 E. Trant Dr.	Kingsville, TX 78363
Monsanto	408 Vista Cove	Victoria, TX 77904
Phytogen	832 Swynford Ln.	Collierville, TX
Pioneer International	14901 Red River	Corpus Christi, TX 78410
Seed Source Genetics	5159 FM 3354	Bishop, TX 78343
Sesaco	29865 N. Abram Rd.	Edinburg, TX 78511
Sorghum Partners, LLC	P O Box 189	New Deal, TX 79350
Stoneville Pedigreed Seed Co.	13557 Carlos 5th Port	Corpus Christi, TX 78418
Terral Seed	P O Box 997	El Campo, TX 77437
Triumph Seed Company Inc.	P O Box 1050	Ralls, TX 79357

COOPERATING CHEMICAL AND FERTILIZER COMPANIES

Bayer Crop Science Division	Will Elkins / Jon Mixson	Corpus Christi, TX 78418
Coastal Acres LLC.	John Miller	Robstown, TX 78380
Dow Agro Sciences	Benny Martinez / Trey Ramirez	Kingsville, TX 78363
Helena Chemical Co.	Dorian David	Corpus Christi, TX 78426
Monsanto	Daniel Gonzalez / Harvey Buehring	Orange Grove, TX 78372

SPECIAL ACKNOWLEDGMENTS FOR TECHNICAL SUPPORT

Mr. Rudy Alaniz	Dr. Joe Paschal	Dr. Dan Fromme
Dr. Tony Provin	Dr. Paul Baumann	James Gricher
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Mr. Kenneth Schaefer	Mr. Jeff Nunley	Mr. Mac Young
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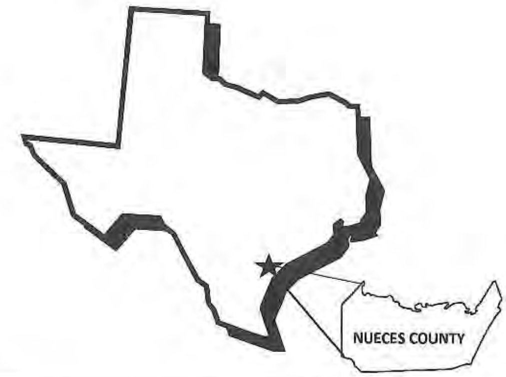
	Dr. Carlos Fernandez	



NUECES COUNTY

Agricultural Statistics

County Seat—Corpus Christi, TX

Population (2012)	**343,281**

Land Area	**Acres**
Cropland/Improved Pastures	311,300
Rangeland	33,800
Industrial Sites, Recreational Facilities	
Urban Areas	93,492
Total	**438,592**

Major Agricultural Commodities	**(2012)**
Grain Sorghum Planted Acres	187,196
Cotton Planted Acres	112,793
Corn Planted Acres	3,167
Wheat Planted Acres	1,549
Sesame Planted Acres	609
Sunflower Planted Acres	1,415
Hay Acreage Planted Acres	10,000
Beef Cattle Cow #s	3,500

2012 Agricultural Income	**$1000**
Grain Sorghum	11,264
Cotton/Cottonseed	4,721
Government Programs	7,755
Crop Insurance	64,418
Cattle	2,767
Wheat	195
Corn	321
Other	6,621
Total	**$98,062**

Weather	**Data**
Average Daily High Temperature	83°F
Average Daily Low Temperature	63°F
Days above 90°F	101
Days below 32°F	7
Mean Temperature	72°F
First Freeze Date	Dec. 27
Last Freeze Date	Feb. 1
Growing Season Average Dates	303
Precipitation-Mean per Year	31.41"
Precipitation-Days/Years above 0.1"	39

History - *Nueces County was formed in 1846 and was once part of San Patricio County. The county seat is Corpus Christ, and was incorporated in 1846. Nueces County is bordered by San Patricio County (north), Jim Wells County (west), Kleberg County (south) and by Corpus Christi Bay, Laguna Madre and Redfish Bay (all east). The County was named after the Nueces River which flows through the county.*

Topography - *Nueces County comprises 847 square miles of the Coastal Prairies region. The terrain is generally flat. The elevation ranges from sea level to 180 feet above sea level. In the central part of the county the soil varies from vary dark loams to gray or black cracking clayey soils. In the west the soils varies from very dark loams to gray or black cracking clayey subsoils. In the coastal region the soils are sandy; in marsh areas the soils are also very dark with clayey subsoils.*

Climate - *The climate is humid-subtropical. Temperatures range from an average high of 93°F in July to an average low of 47°in January.*

NUECES COUNTY
1929-2012
Yearly Rainfall

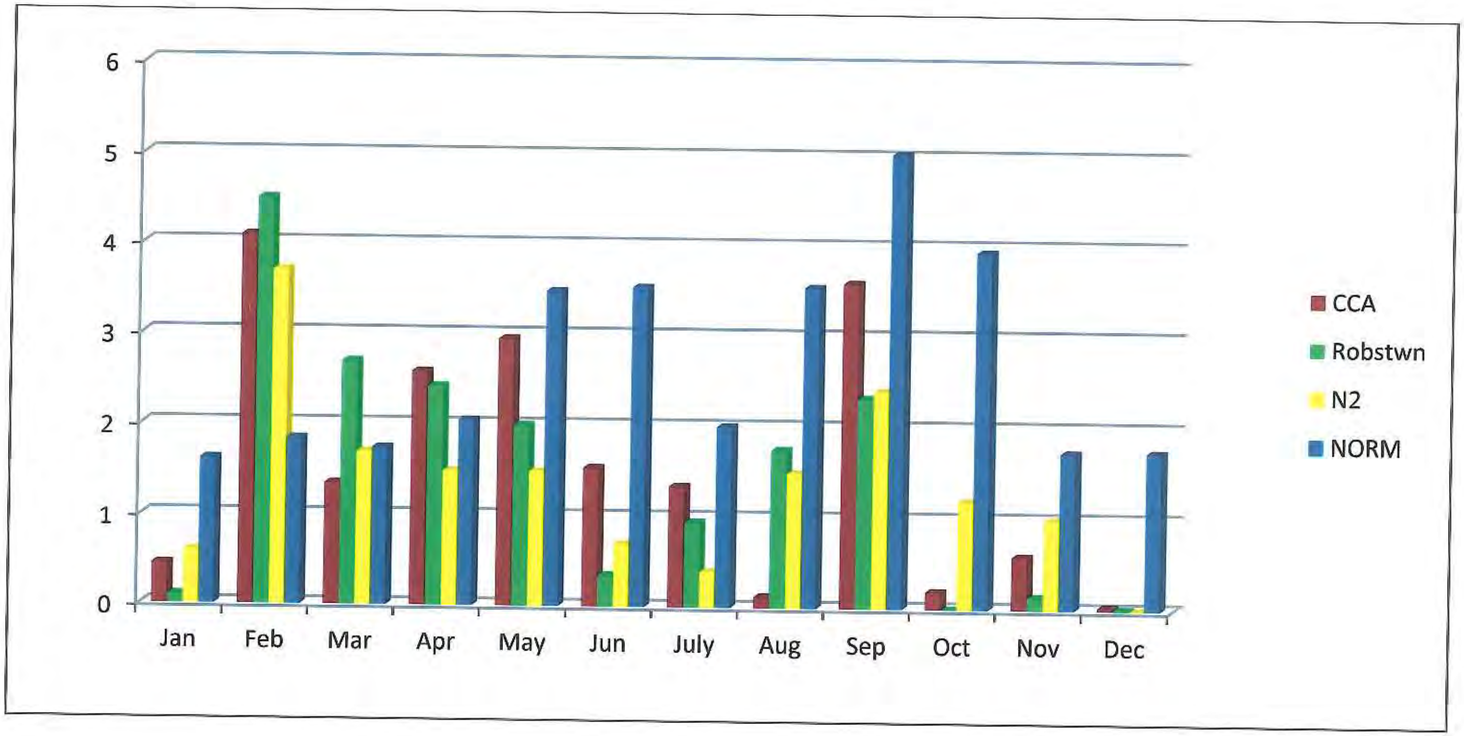
Year	Corpus Christi	Robstown	Year	Corpus Christi	Robstown	Year	Corpus Christi	Robstown
1929	25.67	26.28	1965	25.29	22.83	2001	32.25	33.52
1930	25.31	28.26	1966	29.89	28.86	2002	31.39	44.77
1931	36.86	36.66	1967	38.22	37.31	2003	28.70	35.30
1932	22.67	20.77	1968	41.53	41.45	2004	35.30	39.08
1933	23.06	27.59	1969	23.57	38.83	2005	25.31	21.72
1934	30.97	29.75	1970	39.47	36.34	2006	33.93	26.55
1935	38.99	31.97	1971	36.95	55.62	2007	40.63	49.29
1936	26.28	35.37	1972	36.41	29.23	2008	27.99	25.70
1937	24.05	23.75	1973	43.53	43.86	2009	20.61	11.78
1938	21.54	24.64	1974	24.81	28.20	2010	43.92	35.5
1939	19.74	20.33	1975	25.19	31.49	2011	12.06	6.12
1940	25.13	26.68	1976	39.39	42.37	2012	20.63	17.23
1941	42.13	48.41	1977	26.25	24.79	2013		
1942	33.67	36.34	1978	39.14	34.02	2014		
1943	26.87	20.05	1979	39.04	29.53	2015		
1944	26.45	27.07	1980	32.69	32.50	2016		
1945	30.14	25.20	1981	44.02	41.42	2017		
1946	34.09	N/A	1982	22.47	22.71	2018		
1947	33.26	N/A	1983	36.91	32.21	2019		
1948	22.43	24.96	1984	22.24	30.82	2020		
1949	30.28	27.19	1985	36.70	49.53	2021		
1950	15.48	8.40	1986	32.15	25.46	2022		
1951	26.91	29.82	1987	30.66	33.31	2023		
1952	21.31	12.02	1988	18.91	17.76	2024		
1953	24.14	26.69	1989	19.22	17.41	2025		
1954	16.02	18.38	1990	21.10	24.19	2026		
1955	21.87	22.85	1991	48.07	41.02	2027		
1956	21.73	16.84	1992	41.42	30.31	2028		
1957	28.00	29.91	1993	32.34	30.89	2029		
1958	42.62	44.28	1994	38.96	33.37	2030		
1959	38.44	30.96	1995	36.93	33.85	2031		
1960	44.35	43.01	1996	17.32	20.48	2032		
1961	26.44	28.19	1997	36.03	39.65	2033		
1962	15.49	14.49	1998	30.62	33.38	2034		
1963	14.66	19.29	1999	29.22	28.05	2035		
1964	21.71	20.49	2000	22.08	30.89	2036		
						AVG	***29.65***	***29.60***

Data collected from the National Oceanic and Atomonspheric Administration, National Weather Service, and Nueces County Record Star. Robstown Fire Dept. 2008-2009. Robstown reporting station was closed due to World War II in 1946 and 1947

*Totals for 2004 include snowfall that has been converted into precipitation. (10" snow = 1" r

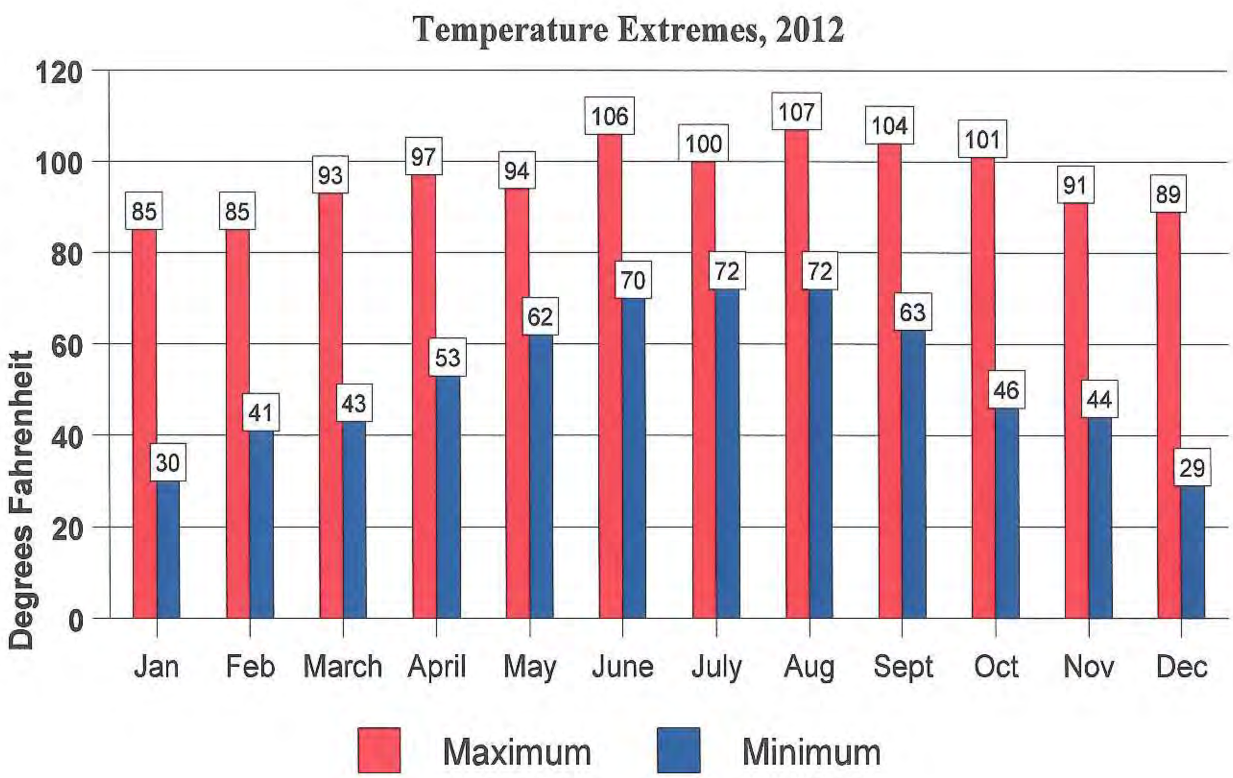
2012 Precipitation Data

Nueces County, Texas



Precipitation Data Collection Site	2012 Precipitation (Inches)
N2 Perry Foundation – South of Robstown	16.2
Corpus Christi Airport	20.63
Robstown	17.23
2012 Rainfall Average	18.02
Normal*	32.26

*This normal is for the time frame 1971-2000 recorded by National Weather Service at Corpus Christi, Texas.



The temperature extremes were computed from data collected at the Clarkwood Research Center, Perry Foundation-South of Robstown, and Robstown Fire Department sites in Nueces County, Texas.

THE CROP-WEATHER PROGRAM FOR SOUTH TEXAS

The Crop-Weather Program for South Texas is an easy-to-use tool that can be accessed via the Internet at http://cwp.tamu.edu.

This program provides information about weather conditions, crop growth and development, crop water use, and soil water storage and is maintained by Dr. Carlos Fernandez of the Texas A&M Agriculture Experiment Station in Corpus Christi, Texas.

MAP LEGEND

Map Number . . . . **Location**

COTTON TRIALS

1 . . . . *Failed Due To Drought (FDTD)* .....**Uniform Stacked-Gene Cotton Variety**
Cooperator: Lawhon Farms

2 . . . . *(FDTD)* .....**Uniform Stacked-Gene Cotton Variety**
Cooperator: Massey Farms

3 . . . . *(FDTD)* .....**Liberty Link Cotton Variety**
Cooperator: Lawhon Farms

4 . . . . *(FDTD)* .....**Cotton Root Rot Control**
Cooperator: Massey Farms

5 . . . . **Cotton Harvest Aid**
Cooperator: Otahal Farms

6 . . . . *(FDTD)* .....**Plant Population Study**
Cooperator: Lawhon Farms

7 . . . . *(FDTD)* .....**Skip Row vs. Conventional**
Cooperator: Jungmann Farms

8 . . . . **Cotton Variety & Cotton Insect Management**
Cooperator: TAMU Research & Extension Center

CORN TRIALS

9 . . . . *(FDTD)* .....**Aflatoxin Control Test**
Cooperator: Jungmann Farms

SORGHUM TRIALS

10 . . . . **Grain Sorghum Hybrid Performance Test**
Cooperator: Faske Farms

11 . . . . *(FDTD)* .....**Grain Sorghum Hybrid Performance Test**
Cooperator: Ordner Farms

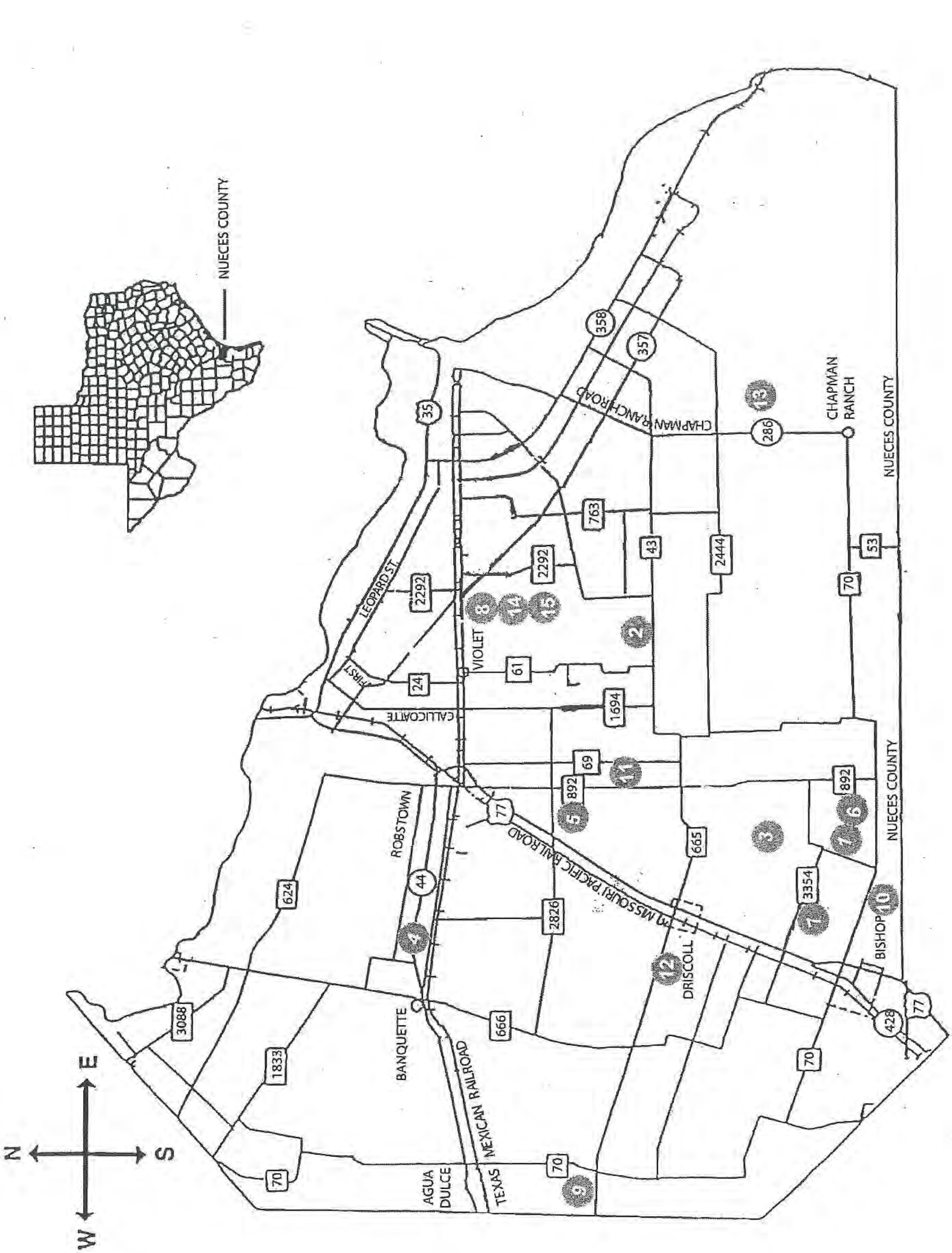
12 . . . . *(FDTD)* .....**Grain Sorghum Hybrid Performance Test**
Cooperator: McNair Farms

13 . . . . **Clump vs. Conventional Planting**
Cooperator: Ocker Farms

14 . . . . **Grain Sorghum Insect Management**
Cooperator: TAMU Research & Extension Center

ALTERNATIVE CROPS

15 . . . . **Sesame, Safflower, Wheat, Canola and Sunflower Evaluations**
Cooperator: TAMU Research & Extension Center


NUECES COUNTY
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E
S
W
LEOPARD ST.
FIRST
VIOLET
CALLICOATTE
CHAPMAN RANCH ROAD
CHAPMAN RANCH
NUECES COUNTY
ROBSTOWN
BANQUETTE
AGUA DULCE
TEXAS MEXICAN RAILROAD
MISSOURI PACIFIC RAILROAD
DRISCOLL
BISHOP
NUECES COUNTY
35
358
357
286
763
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428

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COTTON

Page #

HISTORY OF COTTON PRODUTION
NUECES COUNTY 1929-2012

Year	Acres Harvested	Lbs /Acre	Total Bales	Year	Acres Harvested	Lbs /Acre	Total Bales	Year	Acres Harvested	Lbs /Acre	Total Bales
1929	268,000	213	129,000	1965	104,200	327	62,241	2001	117,000	570	139,000
1930	250,000	295	154,000	1966	71,300	455	64,955	2002	110,000	598	137,000
1931	242,000	178	94,900	1967	66,300	314	41,579	2003	131,300	841	230,000
1932	226,900	140	66,100	1968	87,900	306	53,758	2004	141,600	870	246,384
1933	252,300	227	83,400	1969	87,000	285	49,577	2005	142,900	552	164,200
1934	173,000	159	57,400	1970	60,800	193	23,404	2006	54,500	562	63,800
1935	186,000	232	90,200	1971	63,500	224	29,700	2007	109,600	775	173,347
1936	201,000	207	87,000	1972	74,700	295	44,000	2008	79,800	475	78,900
1937	218,000	203	92,800	1973	49,900	253	25,300	2009	4,116	360	3,087
1938	166,200	232	74,900	1974	54,900	481	52,769	2010	104,050	866	187,721
1939	152,200	254	79,300	1975	27,800	466	25,884	2011	111,527	669	155,441
1940	139,200	201	54,600	1976	48,000	436	43,583	2012	12,820	372	9,935
1941	135,000	212	57,900	1777	78,000	528	85,884	2013			
1942	136,000	276	77,245	1978	77,600	447	72,422	2014			
1943	133,000	297	82,300	1979	109,900	463	105,975	2015			
1944	119,000	215	53,300	1980	100,200	326	68,600	2016			
1945	106,000	211	46,600	1981	67,400	514	71,900	2017			
1946	90,000	235	44,000	1982	53,800	523	58,900	2018			
1947	110,000	289	66,350	1983	39,400	600	49,300	2019			
1948	91,000	282	53,400	1984	56,100	614	72,020	2020			
1949	140,000	353	103,000	1985	58,800	883	107,900	2021			
1950	95,500	235	44,200	1986	59,600	754	93,600	2022			
1951	216,000	51	22,900	1987	60,000	710	85,200	2023			
1952	174,000	282	102,000	1988	86,900	498	90,200	2024			
1953	141,500	60	17,700	1989	66,100	385	53,000	2025			
1954	122,000	432	109,000	1990	86,100	326	58,400	2026			
1955	86,000	112	20,100	1991	117,100	645	157,300	2027			
1956	98,000	315	64,000	1992	77,100	485	77,900	2028			
1957	787,000	339	55,500	1993	78,800	439	72,000	2029			
1958	95,770	434	83,040	1994	87,700	560	102,400	2030			
1959	108,200	336	74,669	1995	125,200	589	153,700	2031			
1960	114,600	352	80,570	1996	75,700	337	53,100	2032			
1961	107,600	420	90,385	1997	97,900	454	92,500	2033			
1962	116,900	267	62,480	1998	85,100	446	79,000	2034			
1963	106,400	181	38,602	1999	109,100	757	172,000	2035			
1964	109,200	285	62,240	2000	118,300	771	190,000	2036			

Data secured from U.S. Department of Agriculture Statistical Reporting Service and Texas Crop Livestock Reporting Service.

Figures for the 2012 season were estimated using data obtained from the Nueces County FSA Office, and the Nueces County Extension Office

TEXAS A&M AGRILIFE EXTENSION

Agriculture and Natural Resources

COTTON HARVEST AID PERFORMANCE DEMONSTRATION

Nueces County, 2012

Cooperator: Claude Otahal

Authors:

Jeffrey R. Stapper, Dan Fromme, and J.R. Cantu

County Extension Agent -AG/NR, Assistant Professor and Extension Agronomist, and Ag Demonstration Assistant, respectively

Summary

A total of twelve different treatments were applied to the cotton variety FM 835 LLB2 to evaluate their leaf drop and harvest aid effectiveness in a strip test located on FM 2826, Southeast of Robstown. A seven and fourteen day after treatment rating were taken with treatment costs ranging from a low of $1.82/acre to a high of $10.72/acre. Performance of defoliants was impacted by very moisture stressed cotton at time of application.

Objective

To evaluate the effectiveness of selected harvest aid treatments in preparing cotton for harvest.

Materials and Methods

Treatments were established in a strip test of dryland cotton on 30-inch row spacing, with each plot 150 feet in length. Defoliation treatments were applied June 26, 2012 with a self-propelled sprayer delivering 11 gallons per acre. Treatments were applied from 10:30 A.M. to 11:30 A.M. The broadcast application was made with Turbo TeeJet 11002 nozzle tips on 20-inch spacing. The cotton variety was FM 835 LLB2, and had about 20% open bolls at time of initial treatment. Average plant height was 21 inches. Defoliation ratings were taken seven and fourteen DAT.

Results and Discussion

Crop growing conditions throughout the season were not good and rainfall during the season was below normal. Results are recorded in Table 1 and Table 2.

Table 1. Comparison of treatment rates and estimated cost per acre, 7 DAT, Otahal Farm, Nueces County, 2012.

Trt No.	Treatment	Product Rate per acre	Estimated Cost[1]	Defoliation (%)	Desiccation (%)	Green Leaf (%)
1	Thidiazuron Non-ionic surfactant (NIS)	1.6 fl oz 0.25 % v/v	$1.82	30	0	70
2	Thidiazuron NIS	3.2 fl oz 0.25 % v/v	$3.59	40	0	60
3	Thidiazuron Def NIS	1.6 fl oz 4.0 fl oz 0.25 % v/v	$3.66	70	5	25
4	Thidiazuron Def NIS	1.6 fl oz 8.0 fl oz 0.25 % v/v	$5.50	80	5	15
5	Ginstar NIS	3.0 fl oz 0.25 % v/v	$5.44	30	0	70
6	Ginstar Crop oil concentrate (COC)	3.0 fl oz 1.0 % v/v	$5.50	87	3	10
7	Ginstar Ethephon NIS	3.0 fl oz 24.0 fl oz 0.25 % v/v	$10.72	70	3	27
8	Thidiazuron Ginstar NIS	1.6 fl oz 2.0 fl oz 0.25 % v/v	$5.42	30	1	69
9	Thidiazuron Ginstar Ethephon NIS	1.6 fl oz 0.8 fl oz 24.0 fl oz 0.25 % v/v	$8.54	70	10	20
10	Aim Ethephon COC	1.0 fl oz 24.0 fl oz 1.0 % v/v	$7.05	19	1	80
11	ET Ethephon COC	1.5 fl oz 24.0 fl oz 1.0 % v/v	$9.42	14	1	85
12	Gramoxone Inteon NIS	8.0 fl oz 0.25 % v/v	$2.04	39	1	60

[1] *Estimated cost is for educational purposes only and prices listed are not actual "carry out" prices.*

Table 2. Comparison of treatment rates and estimated cost per acre, 14 DAT, Otahal Farm, Nueces County, 2012.

Trt No.	Treatment	Product Rate per acre	Estimated Cost[1]	Defoliation (%)	Desiccation (%)	Green Leaf (%)
1	Thidiazuron Non-ionic surfactant (NIS)	1.6 fl oz 0.25 % v/v	$1.82	25	0	75
2	Thidiazuron NIS	3.2 fl oz 0.25 % v/v	$3.59	35	0	65
3	Thidiazuron Def NIS	1.6 fl oz 4.0 fl oz 0.25 % v/v	$3.66	69	1	30
4	Thidiazuron Def NIS	1.6 fl oz 8.0 fl oz 0.25 % v/v	$5.50	79	1	20
5	Ginstar NIS	3.0 fl oz 0.25 % v/v	$5.44	25	0	75
6	Ginstar Crop oil concentrate (COC)	3.0 fl oz 1.0 % v/v	$5.50	84	1	15
7	Ginstar Ethephon NIS	3.0 fl oz 24.0 fl oz 0.25 % v/v	$10.72	68	0	32
8	Thidiazuron Ginstar NIS	1.6 fl oz 2.0 fl oz 0.25 % v/v	$5.42	26	0	74
9	Thidiazuron Ginstar Ethephon NIS	1.6 fl oz 0.8 fl oz 24.0 fl oz 0.25 % v/v	$8.54	70	5	25
10	Aim Ethephon COC	1.0 fl oz 24.0 fl oz 1.0 % v/v	$7.05	15	0	85
11	ET Ethephon COC	1.5 fl oz 24.0 fl oz 1.0 % v/v	$9.42	9	1	90
12	Gramoxone Inteon NIS	8.0 fl oz 0.25 % v/v	$2.04	38	1	61

[1]*Estimated cost is for educational purposes only and prices listed are not actual "carry out" prices.*

Conclusions

In this dry year, with cotton plants severely stressed at time of defoliant application, performance of products was not what one would normally expect. A few days following treatment a rain event occurred which left 1.6 inches at the site. The result was the beginning of terminal growth as noted in the 14 DAT, thus the reduction in percent defoliation and increase in percent green leaf. Each year the cotton crop responds differently to harvest aids, as environmental conditions are always different, thus the need to evaluate these products on an annual basis.

Acknowledgements

The support and cooperation of Claude Otahal for cooperating in the implementation of this demonstration is appreciated and the support and assistance provided by Gary Schwarzlose with Bayer CropScience for supplying product and application of products is also appreciated.

Table 5. Uniform Stacked-Gene Cotton Variety Trials, 2012

Texas A&M AgriLife Research and Extension Center

Corpus Christi, Texas

Dr. Dan D. Fromme, Assistant Professor and Extension Agronomist

Rudy Alaniz, Technician and Clinton Livingston, Technician

Variety	Lint (lbs/acre)		Turnout %		Micronaire		Length (inches)		Strength (g/tex)		Uniformity		Loan Value (¢/lb)		Lint Value ($/acre)	
PHY 499WRF	2368	a	44.5	a	4.78	ab	1.13	c	32.85	bc	85.03	a	54.06	a	1280.04	a
AT NITRO 44B2RF	2317	ab	42.5	bc	4.13	c	1.23	a	33.75	ab	84.73	a	54.18	a	1255.33	ab
CG 3787B2RF	2206	ab	44.1	a	4.78	ab	1.15	bc	29.7	g	84.55	a	53.81	a	1186.95	abc
ST 5458B2RF	2189	ab	41.5	c	4.85	a	1.12	c	31.05	d-g	83.13	a	53.10	a	1163.62	abc
PHY 375WRF	2166	ab	42.9	b	4.23	c	1.13	c	29.9	fg	84.15	a	53.71	a	1163.88	abc
DP 1044B2RF	2162	ab	39.9	d	4.98	a	1.12	c	30.35	efg	84.03	a	52.08	a	1124.69	bcd
DP 1219B2RF	2145	ab	41.6	c	4.85	a	1.18	b	34.43	a	83.73	a	53.36	a	1143.55	a-d
AM 1511B2RF	2107	bc	44.2	a	4.98	a	1.13	c	31.85	cd	84.53	a	52.61	a	1111.15	cd
FM 1944GLB2	2084	bc	40.3	d	4.63	b	1.18	b	31.28	def	83.45	a	53.85	a	1122.20	bcd
FM 8270GLB2	1867	c	39.5	d	4.25	c	1.18	b	31.48	cde	84.9	a	54.05	a	1009.18	d
Mean	**2161**		**42.1**		**4.64**		**1.15**		**31.66**		**84.22**		**53.48**		**1156.06**	
P>F	0.0324		0.0001		0.0001		0.0001		0.0001		0.166		0.0525		0.0294	
LSD (P=.05)	249.4		1.05		0.207		0.0339		1.496		NS		NS		138.59	
STD DEV	171.8		0.724		0.142		0.0234		1.031		1.007		0.9302		95.52	
CV%	7.95		1.72		3.07		2.03		3.26		1.2		1.74		8.26	

Planting date: 3/13/12

Harvest date: 8/16/12

Irrigated: yes-drip

Row spacing: 38 inches

Plot sizes: 2 rows by 35 feet.

Each variety was replicated 4 times in a RCB design.

Table 6. Uniform Stacked-Gene Cotton Variety Trials, 2012
Texas A&M AgriLife Research and Extension Center
Corpus Christi, Texas
Dr. Dan D. Fromme, Assistant Professor and Extension Agronomist
Rudy Alaniz, Technician and Clinton Livingston, Technician

Variety	Lint (lbs/acre)		Turnout %		Micronaire		Length (inches)		Strength (g/tex)		Uniformity		Loan Value (¢/lb)		Lint Value ($/acre)	
PHY 375WRF	753.5	a	43.7	bc	3.88	bc	1.03	b-e	28.25	c	81.68	c	49.98	a	377.22	a
PHY 499WRF	722.5	a	44.5	ab	4.08	ab	1.00	e	30.18	b	83.50	ab	49.24	a	356.18	ab
FM 8270GLB2	607.2	b	42.9	c	3.55	d	1.05	b	28.68	bc	82.20	c	51.80	a	315.12	bc
DP 1219B2RF	569.5	b	41.9	d	3.9	bc	1.05	b	29.73	bc	81.93	c	51.30	a	292.57	c
DP 1044B2RF	566.6	b	40.6	e	3.85	c	1.02	cde	29.05	bc	82.28	c	49.65	a	281.30	c
FM 1944GLB2	563.4	b	41.7	d	3.78	c	1.06	b	25.98	d	81.75	c	50.86	a	286.73	c
AM 1511B2RF	559.4	b	43.8	b	4.23	a	1.01	de	29.78	bc	82.40	bc	49.50	a	276.82	c
ST 5458B2RF	556.5	b	41.5	d	3.83	c	1.04	bcd	29.18	bc	81.73	c	50.76	a	282.34	c
CG 3787B2RF	555.3	b	44.8	a	4.2	a	1.04	bc	29.65	bc	82.60	bc	50.66	a	283.15	c
AT NITRO44B2RF	554.0	b	41.1	de	3.3	e	1.11	a	32.08	a	83.83	a	51.50	a	285.98	c
Mean	**600.77**		**42.64**		**3.86**		**1.04**		**29.25**		**82.39**		**50.53**		**303.74**	
P>F	0.0004		0.0001		0.0001		0.0001		0.0001		0.0031		0.2312		0.0092	
LSD (P=.05)	93.89		0.878		0.214		0.0343		1.553		1.1		NS		57.04	
STD DEV	64.708		.605		0.147		0.0236		1.07		0.758		1.4984		39.31	
CV%	10.77		1.42		3.82		2.27		3.66		0.92		2.97		12.94	

Planting date: 3/13/12
Harvest date: 7/12/12
Irrigated: no
Row spacing: 38 inches
Plot sizes: 2 rows by 35 feet.
Each variety was replicated 4 times in a RCB design.

TABLE 12. GLYTOL COTTON VARIETY TRIAL, 2012

Texas A&M AgriLife Research and Extension Center

Corpus Christi, Texas

Dr. Dan D. Fromme, Assistant Professor and Extension Agronomist

Rudy Alaniz, Technician and Clinton Livingston, Technician

Variety	Lint (lbs/acre)		Turnout %		Micronaire		Length (inches)		Strength (g/tex)		Uniformity		Loan Value (¢/lb)		Lint Value ($/acre)	
BX1346GLB2	1929.2	a	42.75	a	5.04	bcd	1.12	cd	31.33	b	83.78	ab	52.28	bc	1010.16	a
BX1347GLB2	1867.8	a	42.20	a	5.00	bcd	1.16	ab	28.93	e	82.88	bc	52.09	bc	974.61	a
ST5458B2RF	1844.2	a	42.55	a	5.46	a	1.12	cd	30.85	bc	82.38	c	50.30	d	927.60	a
FM1740B2F	1813.0	a	42.48	a	4.97	cd	1.10	d	29.35	de	82.03	c	52.03	bcd	941.73	a
FM2989GLB2	1773.7	a	41.35	a	5.22	ab	1.14	bc	30.78	bcd	82.35	c	50.76	cd	902.82	a
FM1944GLB2	1753.4	a	39.48	a	5.05	bcd	1.18	a	30.73	bcd	82.85	bc	52.58	ab	922.78	a
FM8270GLB2	1732.3	a	39.90	a	4.84	d	1.18	a	34.03	a	84.35	a	54.04	a	936.13	a
BX1348GLB2	1725.7	a	40.88	a	5.11	bc	1.18	a	29.58	cde	83.15	bc	51.93	bcd	897.19	a
Mean	**1804.89**		**41.45**		**5.09**		**1.15**		**30.69**		**82.97**		**52**		**939.13**	
P>F	0.5228		0.1977		0.0017		0.0001		0.0001		0.0071		0.0094		0.5825	
LSD (P=.05)	NS		NS		0.2436		0.0329		1.431		1.161		1.7365		NS	
STD DEV	151.353		2.013		0.1656		0.0224		0.973		0.79		1.1807		82.68	
CV%	8.39		4.86		3.26		1.95		3.17		0.95		2.27		8.8	

Planting date: 4/5/12

Emergence date: 4/9/12

Harvest date: 8/16/12

Irrigated: yes-drip

Row spacing: 38 inches

Plot sizes: 4 rows by 35 feet.

Each variety was replicated 4 times in a RCB design.

Nueces Monster Cotton Variety Trial, 2012

Texas A&M AgriLife Research and Extension Center, Corpus Christi, Texas

Dr. Dan D. Fromme, Assistant Professor and Extension Agronomist

Rudy Alaniz, Technician

Clinton Livingston, Technician

Variety	Lint (lbs/acre)		Turnout (%)		Micronaire		Length (inches)		Strength (g/tex)		Uniformity		Loan Value (¢/lb)		Lint Value ($/acre)	
PHY 499 WRF	1193	a	45.6	a-d	5.13	b-g	1.06	k-o	32.63	b-h	84.78	a	50.14	g-m	596.76	ab
ATNITRO 44B2RF	1158	ab	42.3	p-t	4.28	q	1.14	abc	34.00	b	84.50	abc	54.10	a	626.35	a
PHY 367 WRF	1114	abc	44.6	b-k	4.63	m-p	1.06	j-n	31.60	e-o	83.33	a-j	52.23	a-h	582.71	abc
HQ 210 CT	1101	a-d	41.3	tu	5.05	c-j	1.02	pq	31.23	g-o	82.45	g-n	48.03	m-p	530.67	b-i
FM 2989 GLB2	1101	a-d	41.7	r-u	5.10	b-h	1.07	g-m	30.25	m-t	81.25	mn	50.19	f-m	551.98	a-e
AT EPIC RF	1087	a-e	44.3	e-l	4.98	e-k	1.04	l-p	30.58	k-r	84.30	a-d	49.86	i-m	546.81	a-f
PHY 375 WRF	1087	a-e	44.1	h-m	4.93	f-l	1.05	l-p	30.35	l-s	83.05	b-l	50.40	e-l	547.02	a-f
DP 1050 B2RF	1084	a-e	45.4	a-f	5.10	b-h	1.07	h-m	30.13	o-t	82.65	f-m	50.54	d-l	547.37	a-f
DP 1219 B2RF	1071	a-f	43.0	l-q	4.95	f-l	1.10	d-h	33.18	bcd	83.18	b-j	52.29	a-g	559.31	a-d
AU 222	1068	a-g	42.2	p-u	5.05	c-j	1.09	e-k	31.68	d-o	81.60	k-n	50.95	c-j	545.49	a-g
ATXCR103233B2RF	1065	a-g	44.4	d-k	4.85	h-m	1.10	e-j	30.30	l-s	82.85	d-l	52.60	a-e	561.19	a-d
ST 5458 B2RF	1061	a-g	43.4	k-p	5.23	a-e	1.07	g-m	30.38	l-s	82.83	d-l	49.76	i-m	527.57	b-i
FM 1845 LLB2	1058	a-g	41.0	u	4.95	f-l	1.13	bcd	33.48	bc	84.10	a-f	52.83	a-d	559.01	a-d
FM 1740 B2F	1056	a-g	43.5	j-p	4.88	g-m	1.02	opq	28.93	st	81.80	j-n	49.14	j-m	518.28	b-i
ATX 10WSCV340	1050	a-g	44.1	h-m	4.98	e-k	1.06	k-o	31.13	h-o	82.93	d-l	50.46	e-l	528.64	b-i
ATX 10WSCV447	1045	a-g	42.6	o-s	5.05	c-j	1.06	i-n	32.28	c-j	83.08	b-l	50.73	c-k	527.46	b-i
ST 4145 LLB2	1021	b-g	41.6	stu	5.05	c-j	1.05	l-p	30.23	n-t	83.00	c-l	49.28	j-m	502.59	c-j
ATX 9VCCV1020	1007	b-h	44.9	a-i	5.10	b-h	1.03	m-p	29.25	rst	81.55	lmn	49.24	j-m	496.17	c-j
DP1252B2RF	1006	b-h	46.1	a	5.23	a-e	1.07	h-m	30.75	j-r	83.50	a-i	49.98	h-m	502.68	c-j
AM1550B2RF	1003	b-h	44.2	f-m	5.15	b-f	1.01	pq	28.70	t	82.75	e-m	46.41	op	465.37	e-j
AM1511 B2RF	1002	b-h	45.3	a-g	5.25	a-d	1.05	l-p	31.80	d-m	84.23	a-e	48.73	j-n	487.95	d-j
ATX 784381RF	1002	b-h	44.5	c-k	4.38	pq	1.11	c-f	31.70	d-n	83.75	a-h	53.71	ab	538.32	a-h
DP1044B2RF	995	b-h	42.3	p-t	5.18	b-f	1.04	l-p	30.23	n-t	82.83	d-l	48.40	l-o	482.29	d-j
ATXCR109293B2RF	995	b-h	45.7	abc	4.88	g-m	1.17	a	32.70	b-g	83.95	a-g	53.39	ab	530.58	b-i
DP1032B2RF	993	c-h	44.9	a-i	5.08	c-i	1.11	cde	31.38	f-o	84.13	a-f	51.68	b-i	516.03	b-i

DP0935B2RF	992	c-h	44.1	g-m	5.25	a-d	1.02	pq	28.88	st	82.60	f-m	46.68	nop	462.83	e-j
FM1944GLB2	990	c-h	42.8	n-s	5.05	c-j	1.07	g-m	29.35	q-t	82.38	h-n	50.93	c-j	504.35	c-j
ATLA122	990	c-h	45.8	ab	5.00	d-j	1.03	n-q	30.25	m-t	82.05	i-n	49.06	j-m	484.91	d-j
PHY565WRF	989	c-h	42.9	m-r	4.83	i-n	1.06	k-o	31.78	d-n	83.13	b-k	52.55	a-e	519.79	b-i
HQ212CT	971	c-h	41.3	tu	5.35	ab	0.99	q	31.00	i-p	81.05	n	45.85	p	445.23	ij
AT7A21	959	c-h	43.8	i-o	4.80	j-o	1.07	f-l	32.90	b-f	83.40	a-i	52.45	a-f	503.07	c-j
ATX91239B2RF	955	c-h	44.4	d-k	4.98	e-k	1.10	d-g	30.85	i-q	82.63	f-m	51.81	a-i	495.08	c-j
AU103	947	d-i	44.0	i-n	4.95	f-l	1.09	e-k	32.33	c-i	82.50	g-n	52.03	a-i	492.00	d-j
ATX9CR253 B2RF	941	d-i	44.1	h-m	5.30	abc	1.04	l-p	32.08	c-k	82.78	d-m	48.58	k-o	456.86	g-j
FM8270GLB2	926	e-i	42.0	q-u	4.55	op	1.10	d-i	33.13	b-e	83.43	a-i	52.88	abc	490.09	d-j
DP1133B2RF	918	f-i	45.5	a-e	5.45	a	1.07	h-m	31.83	d-l	83.45	a-i	48.89	j-n	448.89	ij
ATX 91139B2RF	917	f-i	45.3	a-h	4.70	l-o	1.07	g-l	29.53	p-t	83.05	b-l	51.66	b-i	476.52	d-j
PHY 440WRF	908	f-i	42.7	o-s	4.80	j-o	1.05	l-p	32.13	c-k	83.28	a-j	50.64	c-l	460.18	f-j
DP1048B2RF	906	ghi	44.7	b-j	4.88	g-m	1.09	e-k	31.00	i-p	82.98	c-l	52.34	a-g	473.49	d-j
ATX981221501B2F	850	hi	43.7	i-o	4.73	k-o	1.11	c-f	33.13	b-e	84.08	a-f	53.53	ab	455.30	hij
PHY755WRF	787	i	39.1	v	4.58	nop	1.16	ab	36.80	a	84.58	ab	54.08	a	425.76	j
Mean	**1009**		**43.62**		**4.96**		**1.07**		**31.36**		**83.06**		**50.71**		**511.53**	
P>F	0.0045		0.0001		0.0001		0.0001		0.0001		0.0001		0.0001		0.0044	
LSD (P=.05	163.97		1.266		0.257		0.036		1.557		1.526		2.2907		89.32	
STD DEV	117.113		0.904		0.183		0.0257		1.112		1.09		1.6362		63.794	
CV%	11.61		2.07		3.7		2.4		3.55		1.31		3.23		12.47	

Planting date: 3/13/12

Emergence date: 3/18/12

Harvest date: 7/20/12

Harvest Method: machine (picker)

Irrigated: yes-drip

Row spacing: 38 inches

Plot sizes: 2 rows by 35 feet

Each variety was replicated 4 times in a RCB design.

COTTON FLEAHOPPER CONTROL WITH SELECTED INSECTICIDES

Texas A&M AgriLife Research and Extension Center, Nueces County, 2012

Roy D. Parker
Extension Entomologist
Corpus Christi, Texas

SUMMARY: Fleahopper numbers were reduced by the first insecticide treatment applied during the 3rd week of squaring by all tested insecticides, but their numbers were not always statistically different from counts in the untreated cotton. Following the second treatment all counts (4, 8, and 12 DAT-2) for all insecticide treatments were significantly lower than numbers detected in the untreated cotton. Only Centric and Intruder numerically showed fleahopper numbers far below the established treatment threshold. Lint production was not improved by insecticides applied for fleahopper possibly due to (1) low density of fleahoppers during the first one to two weeks of squaring and (2) drought conditions which did not allow plants to hold protected fruit at a level above the untreated cotton. This situation has been observed in previous tests, but failure to treat under these conditions with adequate soil moisture in place could result in loss of substantial lint production.

OBJECTIVES: Fleahopper tests are conducted each year to monitor effectiveness of insecticides and to measure effect of control on lint production.

MATERIALS/METHODS: The fleahopper insecticide evaluation was conducted on PHY 499WRF cotton variety planted on March 26, 2012 at the Texas A&M AgriLife Research and Extension Center at Corpus Christi, Texas. Treatments were arranged in a randomized complete block design with 4 replications in 8-row by 35-foot plots on rows with 38-inch centers. Insecticide was applied to only 4 of the 8 rows to minimize insecticide drift.

The insecticides were applied with a Spider Trac sprayer calibrated to deliver 8.4 gpa total volume through 8X hollow cone nozzles at 45 psi traveling at 5.0 mph. Insecticide was first applied on 5/9 just after fleahopper numbers increased dramatically during the 3rd week of squaring. Fleahopper numbers increased again and a second treatment was made 7 days later on 5/16.

Treatments were assessed by (1) counting fleahoppers on 20 plants/plot during the early third week of squaring on 5/8 [pretreatment], 5/12 [3 DAT-1], 5/15 [6 DAT-1], 5/20 [4 DAT-2], 5/24 [8 DAT-2], and 5/28 [12 DAT-2]; (2) estimating the number of aphids/leaf in plots on 5/24 and again on 5/28; (3) assigning a mite damage rating [1 = no damage up to 5 = mites and severe leaf damage] to each plot on 5/24 and 5/28; and (4) harvesting the center two rows in each plot on 7/20 with a 2-row John Deere 9900 spindle picker. Seed cotton samples were weighed and ginned for turnout. The sample was ginned on a 10-saw Eagle laboratory machine.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance (ANOVA). Means were separated by least significant difference (LSD) so as to list the actual LSD separation for each data column.

RESULTS/DISCUSSION: Fleahopper nymphs and adults increased rapidly due an egg hatch and adult migration into cotton at the test site during the third week of squaring (Tables 1 and 2). Nymphs were very small when counts were made on 5/8 (pretreatment counts) and about equal numbers of nymphs and adults were present. Surprisingly, nymph numbers were greatly reduced even in the untreated cotton 4 days later or 3 days after treatment 1 (DAT-1) and 6 DAT-1. No statistical differences in nymph numbers were observed due to insecticide treatment for the first two inspection dates, but adult numbers rebounded and exceeded the established treatment threshold by 6 DAT-1 in all insecticide treatments except for Centric.

The number of fleahopper nymphs in untreated cotton remained above the economic treatment threshold for all inspection dates following the second treatment (4, 8, and 12 DAT-2). All insecticide treatments had statistically lower numbers of cotton fleahoppers compared to the untreated on these inspection dates. Centric treated cotton had numerically fewer fleahoppers than any other insecticide treatment at 12 DAT-2, but only statistically fewer than the number found in the Couraze (2.00 oz/acre) treatment; the same results were observed in post-treatment average counts. Similar results, i.e. lower number of fleahopper nymphs for extended number of days in Centric treated cotton, have been observed in many earlier tests.

Pretreatment fleahopper adult numbers were significantly different in the plots with the lowest numbers in the acephate and untreated plots (Table 2). Even though adult fleahopper numbers were greatly reduced in insecticide treatments compared with the untreated cotton by 3 DAT-1, statistical differences were not demonstrated; however, by 6 DAT-1 the Intruder and Centric treated cotton fleahopper adult counts were significantly lower than in the untreated cotton. By 4 DAT-2 all insecticide treated cotton had fewer fleahoppers with only the Intruder treatment not statistically different from the untreated. Significant differences were not observed among any treatment in adults at 8 DAT-2, although numerically higher numbers were in untreated cotton. By 12 DAT-2 all insecticide treated cotton showed significantly fewer adults than the nontreated. These erratic results may have been the result of uneven distribution of adults at the test site. Therefore, possibly the best data to use in judging adult fleahopper control would be the post-treatment averages. In that case all insecticide treatments had significantly fewer adult fleahoppers compared to the untreated, the Centric treatment showed a higher level of control except for Intruder, and all the insecticides kept adult fleahopper numbers below the treatment threshold outlined in the Texas insect management guidelines.

Combined nymph and adult fleahopper counts are shown in Table 3. Counts of total fleahoppers made 3 and 6 DAT-1 were lower in insecticide treatments, but their numbers were not always statistically different from that found in untreated cotton. However, all counts on all inspection dates following the second insecticide application (4, 8, and 12 DAT-2) and the post-treatment average counts were significantly lower in all insecticide treated cotton. Combined nymph and adult fleahopper numbers were statistically fewer in all but the Intruder treatment for the post-treatment average. Only Centric and Intruder kept fleahopper numbers far below the established treatment threshold.

Cotton aphid numbers and spider mite damage was very low; there were no numerical trends observed following the insecticide treatments (Table 4). There has been a tendency to observe an increase in both cotton aphid and spider mites following treatment with certain insecticides used for fleahopper control.

Lint production was not improved by treatment for fleahopper in this test; furthermore, on a numerical basis, the untreated cotton produced numerically more lint (19.8 lb/acre) compared with all but one of the insecticide treatments. This exact situation has been observed in multiple tests over the years when severe drought stress occurs during the boll growth period. We would still recommend treatment for the fleahopper at the earlier dates because if adequate moisture is available during the boll set period major loss of lint production would occur.

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Table 1. Comparison of selected insecticides for effectiveness on cotton fleahopper **nymphs**, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Fleahopper **nymphs** per 100 plants						
	Pretreat	3 DAT-1[2/]	6 DAT-1	4 DAT-2	8 DAT-2	12 DAT-2	Post-treat. avg.
Centric 40WG (1.25 oz/acre)	23.8^{a}	0.0^{a}	1.3^{a}	0.0^{b}	0.0^{b}	1.3^{c}	0.5^{c}
Couraze 4F (1.50 oz/acre)	17.5^{a}	0.0^{a}	2.5^{a}	3.8^{b}	0.0^{b}	7.5^{bc}	2.8^{bc}
Couraze 4F (2.00 oz/acre)	16.3^{a}	2.5^{a}	3.8^{a}	2.5^{b}	3.8^{b}	10.0^{b}	4.5^{b}
Intruder 70WP (1.0 oz/acre)	21.3^{a}	0.0^{a}	1.3^{a}	0.0^{b}	1.3^{b}	6.3^{bc}	1.8^{bc}
Acephate 97 (4.00 oz/acre)	22.5^{a}	1.3^{a}	1.3^{a}	0.0^{b}	0.0^{b}	6.3^{bc}	1.8^{bc}
Untreated	21.3^{a}	7.5^{a}	6.3^{a}	40.0^{a}	37.5^{a}	57.5^{a}	29.8^{a}
LSD (P = 0.05)	NS[1/]	NS	NS	7.27	8.18	8.21	3.23
P > F	.5075	.0700	.5189	.0001	.0001	.0001	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant
[2/]DAT = Days After Treatment

Table 2. Comparison of foliar insecticides on cotton for fleahopper control, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Fleahopper **adults** per 100 plants						
	Pretreat	3 DAT-1[2/]	6 DAT-1	4 DAT-2	8 DAT-2	12 DAT-2	Post-treat. avg.
Centric 40WG (1.25 oz/acre)	27.5^{ab}	3.8^{a}	12.5^{c}	2.5^{b}	2.5^{a}	2.5^{b}	4.8^{c}
Couraze 4F (1.50 oz/acre)	32.5^{a}	10.0^{a}	28.8^{abc}	3.8^{b}	1.3^{a}	7.5^{b}	10.3^{b}
Couraze 4F (2.00 oz/acre)	27.5^{ab}	15.0^{a}	30.0^{ab}	5.0^{b}	1.3^{a}	6.3^{b}	11.5^{b}
Intruder 70WP (1.0 oz/acre)	23.8^{bc}	3.8^{a}	20.0^{bc}	8.8^{ab}	1.3^{a}	1.3^{b}	7.0^{bc}
Acephate 97 (4.00 oz/acre)	18.8^{c}	15.0^{a}	27.5^{abc}	3.8^{b}	6.3^{a}	6.3^{b}	11.8^{b}
Untreated	20.0^{c}	25.0^{a}	42.5^{a}	15.0^{a}	8.8^{a}	15.0^{a}	21.3^{a}
LSD (P = 0.05)	7.06	NS[1/]	16.43	7.57	NS	7.31	4.83
P > F	.0074	.1125	.0285	.0266	.2356	.0170	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant.
[2/]DAT = Days After Treatment

Table 3. Comparison of foliar insecticides on cotton for fleahopper control, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Fleahopper **nymphs** and **adults** per 100 plants						
	Pretreat	3 DAT-1[2/]	6 DAT-1	4 DAT-2	8 DAT-2	12 DAT-2	Post-treat. avg.
Centric 40WG (1.25 oz/acre)	51.3^{a}	3.8^{b}	13.8^{c}	2.5^{b}	2.5^{b}	3.8^{b}	5.3^{d}
Couraze 4F (1.50 oz/acre)	50.0^{a}	10.0^{b}	31.3^{abc}	7.5^{b}	1.3^{b}	15.0^{b}	13.0^{bc}
Couraze 4F (2.00 oz/acre)	43.8^{a}	17.5^{ab}	33.8^{ab}	7.5^{b}	5.0^{b}	16.3^{b}	16.0^{b}
Intruder 70WP (1.0 oz/acre)	45.0^{a}	3.8^{b}	21.3^{bc}	8.8^{b}	2.5^{b}	7.5^{b}	8.8^{cd}
Acephate 97 (4.00 oz/acre)	41.3^{a}	16.3^{ab}	28.8^{bc}	3.8^{b}	6.3^{b}	12.5^{b}	13.5^{bc}
Untreated	41.3^{a}	32.5^{a}	48.8^{a}	55.0^{a}	46.3^{a}	72.5^{a}	51.0^{a}
LSD (P = 0.05)	NS[1/]	17.01	19.77	11.59	11.42	12.85	6.71
P > F	.0990	.0227	.0333	.0001	.0001	.0001	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant.
[2/]DAT = Days After Treatment

Table 4. Aphid number, spider mite damage, and lint production in cotton treated for fleahopper, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Aphids/leaf		Mite ratings[2/]		Lint yield lb/acre
	8 DAT-2	12 DAT-2	8 DAT-2	12 DAT-2	
Centric 40WG (1.25 oz/acre)	3.0[a]	1.8[a]	1.0[a]	1.0[a]	602
Couraze 4F (1.50 oz/acre)	2.8[a]	3.0[a]	1.0[a]	1.0[a]	605
Couraze 4F (2.00 oz/acre)	1.8[a]	5.3[a]	1.0[a]	1.0[a]	635
Intruder 70WP (1.0 oz/acre)	1.5[a]	1.8[a]	1.0[a]	1.0[a]	585
Acephate 97 (4.00 oz/acre)	2.3[a]	2.0[a]	1.0[a]	1.0[a]	609
Untreated	1.3[a]	1.5[a]	1.0[a]	1.0[a]	627
LSD (P = 0.05)	NS[1/]	NS	NS	NS	NS
P > F	.7008	.1304	1.00	1.00	.8587

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant
[2/]Spider mite ratings range from 1 = few mites and little damage to 5 = higher numbers and significant leaf damage.

PLANT DENSITY AND FLEAHOPPER INSECTICIDE TREATMENT EFFECTS ON COTTON FRUITING AND LINT PRODUCTION

Texas A&M AgriLife Research and Extension Center, Nueces County, 2012

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SUMMARY: Delay in development of a fleahopper population in cotton and drought conditions which limited potential boll production resulted in lower impact of the fleahopper on boll and lint production than otherwise expected. There were, however, numerical trends which indicated lower boll production, less retention of fruit, and slightly lower lint production in non-insecticide treated cotton.

OBJECTIVES: The field study was conducted to measure differences in cotton production as it related to plant density and number of insecticide treatments for the cotton fleahopper. Impact of treatments on fruiting characteristics as to the location of bolls on cotton plants was a primary objective of the study.

MATERIALS/METHODS: Phytogen 499 B2RF cotton variety was planted on March 14, 2012 at the Meaney Annex of the Texas A&M Agrilife Research and Extension Center at Corpus Christi, Texas with a 4-row 6100 model John Deere planter. Rows were spaced on 38-inch centers and cotton was planted at either 3 or 6 seed/row foot. The test was arranged in a randomized complete block design with 4 replications of each treatment. Plots were 8 rows wide by 35 feet long of which 4 rows were treated at various intervals with Centric 40WG (1.25 oz/acre) for cotton fleahopper. The insecticide was applied at either the 2^{nd} and 5^{th} week or 2^{nd}, 3^{rd}, 4^{th} and 5^{th} week of squaring. The treatments were made on 4/23, 4/30, 5/8, or 5/14, respectively, for the squaring weeks outlined. The insecticide was applied with a Spider Trac sprayer calibrated to deliver 8.8 gpa traveling at 5.0 mph equipped with 8X hollow cone nozzles at 48 psi with 2 nozzles/row.

Treatments were assessed by (1) counting fleahoppers on 20 plant terminals/plot on 4/22 [pretreatment counts], 4/26 [3 DAT-1], 4/29 [6 DAT-1], 5/7 [7 DAT-2], 5/13 [5 DAT-3], and 5/17 [3 DAT-4]; (2) assigning spider mite damage ratings in plots on 5/30 where 1 = no observed damage up to 5 = severe damage; (3) selecting 6 plants from non-harvest rows on 6/20 at the early boll opening stage for plant mapping using PMAP software to summarize the data; and (4) harvesting the center two rows of the 4-row plots with a 2-row model 9900 John Deere spindle picker on 7/12. Seed cotton weights were determined and a 40% turnout was used to determine lint yield.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance (ANOVA), and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: Cotton fleahopper numbers did not exceed the economic treatment threshold until the third week of squaring (Table 1), but by the fourth week their numbers were relatively high in the untreated cotton. Insecticide treatments regardless of treatment timing and number of treatments kept the fleahopper numbers at manageable levels throughout the squaring and early bloom period. Due to drought conditions which existed during the boll production period and thereafter, plants reached 5 nodes above white flower 14 days after first blooms were observed. The relatively late increase in fleahopper numbers and early cutout which resulted in plants not able to hold large amounts of fruit would be expected to limit the effects of fruit protection through fleahopper reduction. Although there were fewer fleahoppers observed where 4 treatments were applied compared with 2 treatments the differences were not always statistically significant, and there were no differences in the post-treatment average counts when comparing the number of treatments applied (treatments applied in squaring weeks 2 and 5 versus squaring weeks 2, 3, 4, and 5).

Plant density and insecticide treatments had no effect on plant internode length or height, but the number of mainstem fruiting nodes was statistically greater at the lower plant density (Table 2). Plant mapping on June 20 just as bolls began to open revealed no differences in the number of green or open bolls/row foot. The number of bolls produced on vegetative branches was influenced by plant density as would be expected with more produced at the lower plant density. There were no statistical differences in total boll production. However, there was a strong trend for fewer green, open, and total bolls where cotton was not treated for fleahopper at both plant densities.

Further breakdown of the fruiting characteristics of cotton plants is presented in Table 3 to include bolls produced by fruiting branch groups and fruiting position off the main stem. Boll production on fruiting branches 1-5 was statistically greater in the higher plant density plots which were treated with insecticide compared with any of the lower plant density treatments. Furthermore, there was a trend for fewer bolls and lower percentage retention of bolls in the untreated cotton. Similar results were observed in boll production measured by fruit production off the main stem. As indicated earlier, appearance of high numbers of fleahoppers in the cotton was delayed until the fourth week of squaring, and the fact that plants were not able to mature higher numbers of bolls as a result of drought had a adverse impact on response of the cotton to fleahopper control. Even then, trends of greater fruit production was observed where fleahopper numbers were reduced with insecticide.

The effects of treatments on spider mite damage and aphid numbers were evaluated on 5/30 which was 16 days after the final application of Centric (Table 4). A significantly higher, but still low, spider mite damage rating was measured in plots where insecticide had been applied 4 times compared with no insecticide or where only 2 treatments were applied. There were not differences in cotton aphid numbers nor were their numbers high enough to adversely affect cotton growth.

As expected no differences were found in lint production (Table 4), but again there was a numerical trend for increased yield in insecticide treated cotton at both plant densities. The average numerical increase in lint production due to insecticide use was 19 pounds lint/acre, and the numerical difference in lint production due to plant density was 37 lb/acre. Even though increased production was not observed as a result of fleahopper control the trends were strong enough to suggest that with more favorable growing conditions (available water) that would have allowed maturity of greater numbers of bolls, substantially higher lint yield would have been realized.

ACKNOWLEDGMENTS: Cotton Incorporated State Support Committee is acknowledged for their support of this project. Rudy Alaniz and Clint Livingston, Demonstration Assistants, are thanked for assistance in conduct of the experiment to include land preparation, planting, weed control, application of treatments, plant mapping, harvest, and processing of seed cotton samples.

Table 1. Effect of cotton plant density on fleahopper numbers with and without insecticide treatment, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

		Fleahoppers per 100 plants						
Planting density (seed/row ft)	Insecticide applied in squaring week	Pretreat week 2	3 DAT-1[1/] week 2	6 DAT-1 week 2	7 DAT-2 week 3	5 DAT-3 week 4	3 DAT-4 week 5	Post-treat. avg.
6	2, 5	1.3^{a}	0.0^{a}	0.0^{b}	8.8^{bc}	20.0^{b}	6.3^{b}	7.0^{b}
6	2, 3, 4, 5	3.8^{a}	0.0^{a}	1.3^{b}	3.8^{c}	11.3^{bc}	5.0^{b}	4.3^{b}
6	untreated	2.5^{a}	2.5^{a}	12.5^{a}	26.3^{ab}	41.3^{a}	35.0^{a}	23.5^{a}
3	2, 5	7.5^{a}	0.0^{a}	1.3^{b}	12.5^{bc}	16.3^{b}	6.3^{b}	7.3^{b}
3	2, 3, 4, 5	2.5^{a}	0.0^{a}	1.3^{b}	6.3^{c}	6.3^{c}	6.3^{b}	4.0^{b}
3	untreated	3.8^{a}	5.0^{a}	5.0^{b}	40.0^{a}	37.5^{a}	38.8^{a}	25.3^{a}
LSD (P=0.05)		NS[2/]	NS	6.19	17.63	8.95	8.59	4.16
P > F		.5373	.3211	.0055	.0036	.0001	.0001	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.

[1/]DAT = Days After Treatment

[2/]NS = Not Significant

Table 2. Influence of cotton plant density and insecticide treatments on plant growth and fruiting characteristics, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Planting density (seed/row ft)	Insecticide applied in squaring week	Internode length (inches)	Plant height (inches)	Mainstem nodes	Bolls/row ft (6/20)			
					green	open	veg branch	total
6	2, 5	1.78[a]	36.2[a]	15.6[b]	17.7[a]	2.1[a]	0.0[b]	19.8[a]
6	2, 3, 4, 5	1.80[a]	28.5[a]	15.8[b]	18.5[a]	1.7[a]	0.2[b]	20.4[a]
6	untreated	1.74[a]	26.6[a]	15.1[b]	15.4[a]	1.5[a]	0.2[b]	17.1[a]
3	2, 5	1.75[a]	29.6[a]	16.9[a]	14.0[a]	0.5[a]	1.7[a]	16.1[a]
3	2, 3, 4, 5	1.80[a]	31.2[a]	17.3[a]	14.9[a]	0.6[a]	0.7[ab]	16.2[a]
3	untreated	1.76[a]	30.1[a]	17.0[a]	12.8[a]	0.4[a]	1.4[a]	14.6[a]
LSD (P=0.05)		NS[1/]	NS	0.89	NS	NS	1.09	NS
P > F		.9293	.5680	.0003	.1764	.4340	.0258	.1052

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant

Table 3. Effect of cotton plant density and fleahopper numbers on boll production with and without insecticide treatments, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Planting density (seed/row ft)	Insecticide applied in squaring week	Fruiting branch groups: bolls per ft 1-5	Fruiting branch groups: bolls per ft 6-10	Fruiting branch groups: % retention 1-5	Fruiting branch groups: % retention 6-10	Fruit position off main stem: bolls/ft 1	Fruit position off main stem: bolls/ft 2	Fruit position off main stem: % retention 1	Fruit position off main stem: % retention 2	Fruit position off main stem: % retention all
6	2, 5	18.8^{a}	1.0^{a}	32.7^{a}	9.7^{a}	19.0^{a}	0.8^{a}	45.4^{bc}	2.2^{c}	25.6^{a}
6	2, 3, 4, 5	19.8^{a}	0.4^{a}	31.6^{a}	5.8^{a}	19.0^{a}	1.3^{a}	46.3^{abc}	3.0^{bc}	24.8^{a}
6	untreated	16.7^{ab}	0.2^{a}	29.8^{a}	10.9^{a}	16.0^{ab}	0.8^{a}	41.7^{c}	2.5^{c}	26.2^{a}
3	2, 5	13.3^{bc}	1.1^{a}	35.1^{a}	6.1^{a}	12.1^{c}	2.4^{a}	50.3^{ab}	11.3^{a}	27.0^{a}
3	2, 3, 4, 5	13.9^{bc}	1.7^{a}	34.6^{a}	6.6^{a}	13.1^{bc}	2.3^{a}	51.6^{a}	10.2^{a}	27.7^{a}
3	untreated	11.8^{c}	1.5^{a}	32.6^{a}	7.1^{a}	11.1^{c}	2.1^{a}	47.8^{abc}	9.5^{ab}	25.6^{a}
LSD (P=0.05)		3.91	NS[1/]	NS	NS	3.19	NS	6.18	6.84	NS
P > F		.0028	.0944	.1503	.5578	.0002	.2580	.0425	.0241	.8490

Means in a column followed by the same letter are not significantly different by ANOVA.

[1/]NS = Not Significant

Table 4. Impact of plant density and insecticide treatments for cotton fleahopper on mite damage rating and lint production, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Planting density (seed/row ft)	Insecticide applied in squaring week	Mite damage rating[1/]	Aphids/leaf on 5/30	Lint lb/acre
6	2, 5	1.5[b]	7.3[a]	513[a]
6	2, 3, 4, 5	2.8[a]	2.3[a]	497[a]
6	untreated	1.0[b]	3.8[a]	484[a]
3	2, 5	1.0[b]	5.0[a]	460[a]
3	2, 3, 4, 5	2.5[a]	2.5[a]	474[a]
3	untreated	1.0[b]	3.3[a]	450[a]
LSD (P=0.05)		0.976	NS[1/]	NS
P > F		.0027	.2086	.7301

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Spider mite damage ratings range from 1 = no observed damage up to 5 = severe damage.
[2/]NS = Not Significant

TIMING OF INSECTICIDE TREATMENTS ON COTTON FOR CONTROL OF FLEAHOPPER AND MEASURE OF EFFECTS ON FRUITING

Texas A&M AgriLife Research and Extension Center, Nueces County, 2012

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SUMMARY: Studies have been conducted for several years to determine fruiting response of cotton from square removal caused by the fleahopper by applying insecticide at various times during the early weeks of squaring to reduce their numbers . In certain years, when fleahopper numbers are high early and good growing conditions are experienced, yield increase due to fleahopper control has been observed. In 2007, for example, dollar returns ranged from $43-88 dollars/acre as a result of fleahopper control. However, in other years where soil moisture was very limited even with high numbers of fleahoppers a yield effect could not be measured. Plants were simply not able to hold fruit that had been protected from the fleahopper.

The current study was conducted on land without a full profile of moisture and with inadequate rainfall during the season. Therefore, early cutout occurred and effects of fleahopper on fruit production were limited. In addition, fleahoppers did not increase to high numbers until the 3rd squaring week. Even in this situation trends were observed in the data indicating that the insect was having an effect on plant growth and fruiting. Insecticide untreated plants were slightly taller, had more main stem nodes, exhibited in some cases a lower percentage of open bolls at plant mapping time, and exhibited varied effects on position and retention of fruit. No effects could be documented statistically or numerically on lint production.

OBJECTIVES: The test was conducted to determine insecticide treatment timing effects on cotton fruit and lint production.

MATERIALS/METHODS: The cotton variety Phytogen 499 B2RF was planted March 14, 2012 at the Meaney Annex of the Texas A&M AgriLife Research and Extension Center at Corpus Christi, Texas with a 4-row 6100 model John Deere planter. Rows were spaced on 38-inch centers, and cotton was planted at 4 seed per foot. The test was arranged in a randomized complete design with 4 replications. Plots were 8 rows wide and 35 feet long of which 4 rows were treated with Centric 40WG (1.25 oz/acre) at various times during the squaring stage of cotton growth (intervals shown in the data tables). The insecticide Centric was applied beginning in the 1st squaring week on 4/19 followed by additional treatments on 4/27, 5/3, 5/9, and 5/14. Centric was applied with a Spider Trac sprayer calibrated to deliver 8.8 gpa traveling at 5.0 mph equipped with 8X hollow cone nozzles at 48 psi with 2 nozzles/row.

Treatments were assessed by (1) counting fleahoppers on 20 plant terminals/plot on 4/19 [pretreatment], during the 1st squaring week, 4/22 [3 DAT-1 = days after treatment 1], 4/25 [6 DAT-1], 4/30 [3 DAT-2], 5/3 [6 DAT-2], 5/9 [6 DAT-3], 5/13 [4 DAT-4], and 5/17 [3 DAT-5]; (2) determining the fruiting pattern of 6 plants/plot using P-MAP software as bolls began to open on 6/22; (3) harvesting the center two rows of the 4-row treated plots with a 2-row model 9900

John Deere spindle picker on 7/12. Seed cotton weights were determined and a 40% turnout was used to determine lint yield.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance (ANOVA), and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: Significant numbers of fleahoppers did not occur in the test cotton until the third week of squaring (Tables 1, 2, 3). Six days after the third week treatment their numbers in cotton that had not been treated by that time exceeded 40 per 100 plant terminals. Therefore, substantial numbers of squares were set before the high populations of fleahoppers were present in the test. Migration of large numbers of adult fleahoppers into the cotton was noted 4 DAT in week 4. All treatment timings kept fleahopper nymphs significantly lower than the completely untreated cotton, but even then their numbers were not excessively high based on post-treatment average count (Table 1). There were not differences in adult fleahopper numbers for the post-treatment average counts (Table 2). When both nymph and adult counts were combined, significantly more were observed in the completely untreated cotton (Table 3).

Based on the late development of fleahopper infestation in the cotton and drought which resulted in earlier than desired cutout little effect on plant growth or fruiting was expected. There were no statistical effects on internode length or on plant height (Table 4). In past studies with more fleahopper infestation we have documented that plants from which fruit was removed by fleahopper were taller at the end of the season. The plant height and number of main stem nodes was greatest in the untreated cotton, but these measurements were not statistically different from the other treatments. Plant mapping (P-MAP) showed no differences in the number of green bolls, bolls on vegetative branches, or total bolls. However, there were significant differences in the number of open bolls on the plant mapping date. Generally more open bolls were found in plots treated in weeks 1 to 3 of fruiting.

More detail on boll location on plants, fruit retention percentages, and lint production is provided in Table 5. There was a statistical trend for more open bolls on fruit position 1 off the main stem in cotton treated with insecticide in squaring week 1; furthermore, fruit retention tended to be greater in these same treatments except that the untreated cotton plants also had a relatively high retention rate. No other statistical differences were found in the fruit location and retention data, nor did any treatments affect the lint production level.

ACKNOWDEDGMENTS: Cotton Incorporated State Support Committee is acknowledged for their support of this project. Special thanks are extended to Rudy Alaniz and Clint Livingston, Demonstration Assistants, for many tasks in conduct of this study. The Behmann Foundation is also acknowledged for their support over the years. Without their help projects of this type would not be possible.

Table 1. Fleahopper **nymphs** in cotton treated at various timing intervals based on squaring week, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

	Fleahopper **nymphs** per 100 plants and squaring week								
Insecticide applied in squaring week[1/]	Pretreat[2/] week 1	3 DAT-1[4/] week 1	6 DAT-1 week 1	3 DAT-2 week 2	6 DAT-2 week 2	6 DAT-3 week 3	4 DAT-4 week 4	3 DAT-5 week 5	Post-treat. avg.
1	0.0^{a}	0.0^{a}	0.0^{a}	1.3^{ab}	2.5^{a}	7.5^{bc}	1.3^{b}	7.5^{a}	2.9^{c}
1,2	0.0^{a}	0.0^{a}	0.0^{a}	0.0^{b}	0.0^{a}	0.0^{c}	1.3^{b}	2.5^{bc}	0.5^{cd}
1,2,3	0.0^{a}	1.3^{a}	0.0^{a}	0.0^{b}	0.0^{a}	0.0^{c}	0.0^{b}	0.0^{c}	0.2^{d}
2	0.0^{a}	1.3^{a}	0.0^{a}	0.0^{b}	0.0^{a}	12.5^{b}	0.0^{b}	1.3^{bc}	2.1^{cd}
2, 3	0.0^{a}	2.5^{a}	0.0^{a}	0.0^{b}	0.0^{a}	0.0^{c}	0.0^{b}	0.0^{c}	0.4^{d}
3	0.0^{a}	0.0^{a}	0.0^{a}	1.3^{ab}	2.5^{a}	0.0^{c}	0.0^{b}	1.3^{bc}	0.7^{cd}
1,3	0.0^{a}	0.0^{a}	0.0^{a}	0.0^{b}	1.3^{a}	0.0^{c}	0.0^{b}	2.5^{bc}	0.5^{cd}
4,5	0.0^{a}	0.0^{a}	1.3^{a}	2.5^{ab}	2.5^{a}	30.0^{a}	1.3^{b}	0.0^{c}	5.4^{b}
Untreated	0.0^{a}	0.0^{a}	0.0^{a}	3.8^{a}	1.3^{a}	37.5^{a}	13.8^{a}	18.8^{a}	10.7^{a}
LSD (P=0.05)	NS[3/]	NS	NS	2.56	NS	10.99	5.35	7.31	2.42
P > F	1.000	.2506	.4613	.0439	.5905	.0001	.0003	.0003	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) was applied at indicated squaring week; treatment dates were 4/19, 4/27, 5/3, 5/9 and 5/14.
[2/]First squaring week, (4/19).
[3/] NS = Not Significant
[4/] DAT = Days After Treatment

Table 2. Fleahopper **adults** in cotton treated at various timing intervals based on squaring week, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

	Fleahopper **adults** per 100 plants and squaring week								
Insecticide applied in squaring week[1/]	Pretreat[2/] week 1	3 DAT-1[4/] week 1	6 DAT-1 week 1	3 DAT-2 week 2	6 DAT-2 week 2	6 DAT-3 week 3	4 DAT-4 week 4	3 DAT-5 week 5	Post-treat. avg.
1	1.3^{a}	0.0^{a}	2.5^{ab}	2.5^{b}	5.0^{abc}	12.5^{a}	21.3^{a}	13.8^{a}	8.2^{a}
1,2	1.3^{a}	3.8^{a}	1.3^{b}	1.3^{b}	1.3^{bc}	16.3^{a}	28.8^{a}	20.0^{a}	10.4^{a}
1,2,3	0.0^{a}	2.5^{a}	0.0^{b}	2.5^{b}	1.3^{bc}	11.3^{a}	21.3^{a}	22.5^{a}	8.7^{a}
2	3.8^{a}	3.8^{a}	5.0^{ab}	0.0^{b}	1.3^{bc}	10.0^{a}	21.3^{a}	13.8^{a}	7.9^{a}
2, 3	2.5^{a}	3.8^{a}	5.0^{ab}	0.0^{b}	0.0^{c}	6.3^{a}	16.3^{a}	18.8^{a}	7.1^{a}
3	3.8^{a}	3.8^{a}	8.8^{a}	16.3^{a}	8.8^{a}	5.0^{a}	30.0^{a}	17.5^{a}	12.9^{a}
1,3	0.0^{a}	0.0^{a}	0.0^{b}	2.5^{b}	3.8^{abc}	5.0^{a}	16.3^{a}	13.8^{a}	5.9^{a}
4,5	3.8^{a}	6.3^{a}	8.8^{a}	3.8^{b}	6.3^{ab}	17.5^{a}	13.8^{a}	3.8^{a}	8.6^{a}
Untreated	3.8^{a}	8.8^{a}	6.3^{ab}	3.8^{b}	6.3^{ab}	11.3^{a}	25.0^{a}	16.3^{a}	11.1^{a}
LSD (P=0.05)	NS[3/]	NS	6.34	5.46	5.08	NS	NS	NS	NS
P > F	.3836	.5474	.0404	.0001	.0184	.2103	.2003	.0956	.1168

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) was applied at indicated squaring week; treatment dates were 4/19, 4/27, 5/3, 5/9 and 5/14.
[2/]First squaring week, (4/19).
[3/] NS = Not Significant
[4/] DAT = Days After Treatment

Table 3. Fleahopper **nymphs** and **adults** in cotton treated at various timing intervals based on squaring week, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

	Fleahopper **nymphs** and **adults** per 100 plants and squaring week								
Insecticide applied in squaring week[1/]	Pretreat[2/] week 1	3 DAT-1[4/] week 1	6 DAT-1 week 1	3 DAT-2 week 2	6 DAT-2 week 2	6 DAT-3 week 3	4 DAT-4 week 4	3 DAT-5 week 5	Post-treat. avg.
1	1.3^{a}	0.0^{a}	2.5^{bc}	3.8^{bc}	7.5^{ab}	20.0^{b}	22.5^{bc}	21.3^{b}	11.1^{bc}
1,2	1.3^{a}	3.8^{a}	1.3^{c}	1.3^{bc}	1.3^{bc}	16.3^{bc}	30.0^{ab}	22.5^{ab}	10.9^{bc}
1,2,3	0.0^{a}	3.8^{a}	0.0^{c}	2.5^{bc}	1.3^{bc}	11.3^{bc}	21.3^{bc}	22.5^{ab}	8.9^{bc}
2	3.8^{a}	5.0^{a}	5.0^{abc}	0.0^{c}	1.3^{bc}	22.5^{b}	21.3^{bc}	15.0^{bc}	10.0^{bc}
2, 3	2.5^{a}	6.3^{a}	5.0^{abc}	0.0^{c}	0.0^{c}	6.3^{c}	16.3^{bc}	18.8^{b}	7.5^{c}
3	3.8^{a}	3.8^{a}	8.8^{ab}	17.5^{a}	11.3^{a}	5.0^{c}	30.0^{ab}	18.8^{b}	13.6^{b}
1,3	0.0^{a}	0.0^{a}	0.0^{c}	2.5^{bc}	5.0^{abc}	5.0^{c}	16.3^{bc}	16.3^{bc}	6.4^{c}
4,5	3.8^{a}	6.3^{a}	10.0^{a}	6.3^{bc}	8.8^{a}	47.5^{a}	15.0^{c}	3.8^{c}	13.9^{b}
Untreated	3.8^{a}	8.8^{a}	6.3^{abc}	7.5^{b}	7.5^{ab}	48.8^{a}	38.8^{a}	35.0^{a}	21.8^{a}
LSD (P=0.05)	NS[3/]	NS	6.67	6.91	7.45	12.20	14.06	12.65	5.54
P > F	.3836	.4983	.0362	.0006	.0365	.0001	.0274	.0070	.0004

Means in a column followed by the same letter are not significantly different by ANOVA.

[1/]Centric 40WG (1.25 oz/acre) was applied at indicated squaring week; treatment dates were 4/19, 4/27, 5/3, 5/9 and 5/14.

[2/]First squaring week, (4/19).

[3/] NS = Not Significant

[4/] DAT = Days After Treatment

Table 4. Plant growth characteristics and boll production in cotton treated for fleahopper at various timing intervals based on squaring week, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Insecticide applied in squaring week[1/]	Internode length (inches)	Plant height (inches)	Mainstem nodes	Bolls/plant (6/22) green	open	veg. branch	total
1	1.8[a]	30.1[a]	17.1[a]	2.8[a]	2.8[ab]	0.5[a]	6.0[a]
1,2	1.7[a]	29.7[a]	17.0[a]	2.8[a]	2.5[abc]	0.3[a]	5.6[a]
1,2,3	1.8[a]	31.1[a]	17.0[a]	2.7[a]	3.0[a]	0.2[a]	6.7[a]
2	1.8[a]	30.3[a]	17.0[a]	3.0[a]	1.9[c]	0.3[a]	5.2[a]
2, 3	1.8[a]	31.0[a]	17.1[a]	2.7[a]	2.4[abc]	0.4[a]	5.5[a]
3	1.9[a]	31.8[a]	17.1[a]	3.2[a]	2.0[c]	0.3[a]	5.5[a]
1,3	1.7[a]	29.7[a]	17.0[a]	2.7[a]	3.0[a]	0.2[a]	6.0[a]
4,5	1.8[a]	30.8[a]	17.2[a]	3.0[a]	2.3[bc]	0.3[a]	5.7[a]
Untreated	1.8[a]	32.2[a]	17.5[a]	3.7[a]	2.4[bc]	0.6[a]	5.9[a]
LSD (P = 0.05)	NS[2/]	NS	NS	NS	0.66	NS	NS
P > F	.5950	.5888	.8946	.4372	.0102	.5745	.3705

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) was applied at indicated squaring week; treatment dates were 4/19, 4/27, 5/3, 5/9 and 5/14.
[2/] NS = Not Significant

Table 5. Number of open bolls by fruiting position, percentage retention by fruiting position and branch group, and lint yield in cotton treated for fleahopper at various timing intervals based on squaring week, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Insecticide applied in squaring week[1/]	No. open bolls per plant by position		% fruit retention by position		% fruit retention by branch group		Yield
	1	2	1	2	1-5	6-10	lb lint/acre
1	2.5[abc]	0.3[a]	47.8[abc]	8.7[a]	35.8[a]	5.0[a]	514[a]
1,2	2.4[a-d]	0.1[a]	45.9[abc]	9.9[a]	36.5[a]	4.6[a]	536[a]
1,2,3	2.7[ab]	0.3[a]	48.5[ab]	10.2[a]	35.7[a]	6.4[a]	552[a]
2	1.9[de]	0.0[a]	43.8[bcd]	6.6[a]	31.2[a]	6.5[a]	500[a]
2, 3	2.3[a-e]	0.2[a]	43.0[cd]	8.5[a]	33.9[a]	4.2[a]	521[a]
3	1.7[e]	0.3[a]	39.9[d]	13.9[a]	32.8[a]	7.1[a]	488[a]
1,3	2.8[a]	0.3[a]	49.9[a]	9.0[a]	36.3[a]	6.0[a]	537[a]
4,5	2.2[b-e]	0.1[a]	44.8[bcd]	9.0[a]	35.0[a]	5.5[a]	483[a]
Untreated	2.2[cde]	0.2[a]	46.5[abc]	13.4[a]	34.7[a]	9.6[a]	525[a]
LSD (P = 0.05)	0.55	NS[2/]	4.95	NS	NS	NS	NS
P > F	.0079	.6131	.0121	.3922	.2632	.2682	.4944

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) was applied at indicated squaring week; treatment dates were 4/19, 4/27, 5/3, 5/9 and 5/14.
[2/] NS = Not Significant

BOLL AND LINT PRODUCTION IN COTTON TREATED WITH INSECTCIDE FOR FLEAHOPPER AND/OR TREATED WITH CHEMICALS AFFECTING FRUIT PRODUCTION

Texas A&M AgriLife Research and Extension Center, Nueces County, 2012

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SUMMARY: Lack of available soil moisture during the season did not allow full expression of production and retention of cotton bolls that might have been realized from protection from fleahopper under more favorable growing conditions. Therefore, major objectives of the study were not met. However, some general conclusions and trends will be noted. First, ethephon reduced plant height, and there was a trend for increased number of fruiting mainstem nodes in these plots. In studies across the United States cotton growing regions in previous years, cotton plants treated with ethephon compensated for loss of squares and ended up producing equal or greater yield compared to plants that were not treated with ethephon. Although the opposite result was obtained in this study, the reason for the earlier results may have been due to an increase in the number of mainstem fruiting nodes. Furthermore, there was a more compact boll production area on the plants in the earlier studies. Second, no thidiazuron effects were found. Third, under the conditions encountered in the current study (lack of soil moisture during the fruiting period) no increase in lint production was realized where fleahoppers were aggressively controlled with insecticide compared to no insecticide treatments. Other than the soil moisture problem which interfered with the study, fleahopper numbers were low during the first two squaring weeks, and they were never excessively high during the early cotton fruiting period. Fourth, lint production was statistically reduced where ethephon was applied as the plants did not compensate whether or not they were treated with insecticide for fleahopper.

It is not suggested that either ethephon or thidiazuron be used in early season for cotton production. The attempt was to use these materials to help understand the interaction of the cotton plant and fleahopper effects on growth, development, and fruit production on plants with and without insecticide treatment.

OBJECTIVES: In order to help define the effects of fleahopper on cotton plant growth and fruit set, two chemicals (ethephon used to remove first cotton squares) and thidiazuron (used in the floral industry to reduce bud drop) were applied to cotton to observe the fruiting response with and without insecticide applied for fleahopper.

MATERIALS/METHODS: The cotton variety Phytogen 499 B2RF was planted March 14, 2012 at the Meaney Annex of the Texas A&M AgriLife Research and Extension Center at Corpus Christi, Texas with a 4-row 6100 model John Deere planter. Rows were spaced on 38-inch centers, and cotton was planted at 4 seed per foot. The test was arranged in a randomized complete design with 4 replications. Plots were 8 rows wide and 35 feet long of which 4 rows were treated with the various chemicals. Chemical treatments included the insecticide (Centric 40WG at 1.25 oz/acre), a material to remove squares (ethephon at 6.4 oz/acre), and a chemical used in the floral industry to help retain plant buds (thidiazuron at 1.00 ppm solution). The two plant growth chemicals were only applied one time which was in the 2nd week of squaring. The insecticide Centric was applied beginning in the 2nd squaring week on 4/23 followed by treatments on 4/30, 5/8, and 5/14. The materials were applied with a Spider Trac sprayer calibrated to deliver 8.8 gpa traveling at 5.0 mph equipped with 8X hollow cone nozzles at 48 psi with 2 nozzles/row.

Treatments were assessed by (1) counting fleahoppers on 20 plant terminals/plot on 4/22 [pretreatment] during the 2nd squaring week, 4/26 [3 DAT-1 = days after treatment 1], 4/29 [6 DAT-1], 5/7 [7 DAT-2], 5/13 [5 DAT-3], and 5/17 [3 DAT-4]; (2) determining the fruiting pattern of 6 plants/plot using PMAP software as bolls began to open on 6/21; (3) harvesting the center two rows of the 4-row treated plots with a 2-row model 9900 John Deere spindle picker on 7/12. Seed cotton weights were determined and a 40% turnout was used to determine lint yield. Lint samples were sent to the International Textile Center at Lubbock, Texas for fiber analysis.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance (ANOVA), and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: The objective of measuring differences in response of the cotton plant to fleahopper attack with and without insecticide application to plants treated in various ways to affect fruit set was generally not realized due to dry soil conditions during the square and boll set period. For example, first bloom was observed on 5/12 and 14 days later cotton plants were at 5 nodes above white flower (5 NAWF) which is cutout. The number of fruiting branches was reduced under these conditions as will be shown later in the report.

Another factor which reduced the usefulness of the data was that fleahopper numbers were relatively low until the 4th squaring week (Table 1). The Centric applied on 4 dates did keep fleahopper numbers low throughout the critical squaring period and beyond as can be observed in the post-treatment counts from squaring week 2 through 5. These counts ranged from 1.5-2.3 fleahoppers per 100 plant terminals. The post-treatment average number of fleahoppers where insecticide was not applied ranged from 18.8-21.5 per 100 plant terminals, not an excessive number under the growing conditions encountered.

Statistically significant effects were noted for internode length, plant height, and number of mainstem nodes, but no statistical differences were observed in total green, open, vegetative branch produced, or total bolls on plants when mapped on 6/21 (Table 2). Basically, internode length was greatly reduced with the one application of ethephon applied in the second week of squaring. It was not possible to explain the differences found in plant height, although the shortest plants were found in the ethephon and Centric treated cotton. It did appear that the use of ethephon tended to increase the number of mainstem nodes, but dry conditions limited the ability of plants so treated to set fruit any higher up the plant as had been observed in tests conducted across the Cotton Belt years ago. In other words, the removal of the first squares observed in past studies resulted in compensation to that loss with a more compact boll production period. The drought simply did not allow for the compensation to express in lint production (see later remarks). The total boll count, although not statistically different, was lowest in the ethephon treated cotton.

A closer look at where boll production and percentage fruit retention was observed on cotton plants is provided in Table 3. Ethephon reduced the number of bolls retained on fruiting branches 1-5 as would be expected, but there was only a slight trend, if at all, for increased fruit retention where insecticide was applied to the ethephon treated cotton on these lower fruiting branches. Furthermore, the expected compensation on higher fruiting branches was not realized although fruit retention percentages tended to be higher on branches 6-10 in ethephon treated cotton and the untreated cotton.

Another way to observe plant fruiting characteristics is by boll production and fruit retention on positions off the main stem (Table 3). Similar to that observed in the fruiting branch data discussed above, position 1 boll numbers were statistically lower in plots treated with ethephon, and there was a trend for higher numbers of bolls in these same plots on the second position off the main stem. Similar data were observed for boll retention percentages.

Cotton fiber characteristics and lint production data are provided in Table 4. Statistically significant differences were detected in fiber characteristics only in uniformity measurements. Increased fiber uniformity in Thidiazuron treated cotton that did not receive insecticide treatment could not be explained.

The cotton fleahopper in this study did not have any impact on lint production since the 4 treatments of Centric applied for their control did not result in increased yield in any of the 3 comparisons (Table 4). Lack of increased yield response to fleahopper insecticidal control is attributed to the inability of plants to hold the additional fruit initially protected from fleahopper damage. This was due due to lack of soil moisture. Additionally, the removal of too many squares by the ethephon resulted in statistically reduced lint production in those treatments.

In conclusion, cotton plants were not able to express increased fruit retention or fruiting branch numbers following the use of ethephon whether insecticide was applied for fleahopper or not. Furthermore, compensation of lint production did not occur, all of which is attributed to lack of soil moisture during the critical fruit set and boll maturation period. It is still believed that the technique used in this study to change the fruiting habit of the cotton plant can be used to better understand the effects resulting from the removal of small squares by the fleahopper. It is proposed that similar work be conducted where soil moisture can be managed through irrigation.

ACKNOWLEDGMENTS: Cotton Incorporated State Support Committee is acknowledged for their support of this project. Special thanks are extended to Rudy Alaniz and Clint Livingston, Demonstration Assistants, for their many tasks in conduct of this study. The Behmann Foundation is also acknowledged for their support over the years. Without their help projects of this type would not be possible.

Table 1. Impact of Centric insecticide on cotton fleahopper numbers with and without a single treatment of ethephon or thidiazuron, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Chemical[1/]		Fleahopper **nymphs** per 100 plants						
Insecticide	Plant growth chemical	Pretreat	3 DAT-1[2/]	6 DAT-1	7 DAT-2	5 DAT-3	3 DAT-4	Post-treat. avg.
Centric	None	2.5^{a}	0.0^{c}	1.3^{a}	1.3^{b}	3.8^{b}	1.3^{b}	1.5^{b}
Centric	Ethephon	5.0^{a}	0.0^{c}	2.5^{a}	1.3^{b}	3.8^{b}	3.8^{b}	2.3^{b}
Centric	Thidiazuron	3.8^{a}	1.3^{c}	1.3^{a}	2.5^{b}	2.5^{b}	2.5^{b}	2.0^{b}
None	Ethephon	2.5^{a}	6.3^{ab}	12.5^{a}	26.3^{a}	33.8^{a}	28.8^{a}	21.5^{a}
None	Thidiazuron	1.3^{a}	3.8^{bc}	11.3^{a}	25.0^{a}	26.3^{a}	27.5^{a}	18.8^{a}
None	None	3.8^{a}	8.8^{a}	8.8^{a}	25.0^{a}	26.3^{a}	27.5^{a}	19.3^{a}
LSD (P = 0.05)		NS[3/]	4.77	9.23	13.77	11.56	10.62	4.40
P > F		.7934	.0059	.0519	.0007	.0001	.0001	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) applied on 4/23 (square week 2), 4/30 (square week 3), 5/8 (square week 4), and 5/14 (square week 5). Ethephon (6.4 oz/acre) and thidiazuron (1.00 ppm) were applied one time on 4/23.
[2/]DAT = Days After Treatment
[3/]NS = Not Significant

Table 2. Plant growth characteristics and boll production in cotton treated with insecticide for fleahopper and/or treated with chemicals affecting plant growth, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Chemical[1/]		Internode length (inches)	Plant height (inches)	Mainstem nodes	Bolls/plant (6/21)			
Insecticide	Plant growth chemical				green	open	veg. branch	total
Centric	None	1.86^{ab}	31.1^{ab}	16.75^{c}	5.2^{a}	0.3^{a}	0.4^{a}	6.0^{a}
Centric	Ethephon	1.58^{c}	27.9^{c}	17.63^{ab}	4.4^{a}	0.0^{a}	0.3^{a}	4.7^{a}
Centric	Thidiazuron	1.90^{a}	31.9^{a}	16.79^{bc}	5.1^{a}	0.3^{a}	0.1^{a}	5.5^{a}
None	Ethephon	1.67^{c}	30.5^{ab}	18.25^{a}	4.7^{a}	0.0^{a}	0.3^{a}	5.0^{a}
None	Thidiazuron	1.76^{b}	29.8^{abc}	16.92^{bc}	5.1^{a}	0.3^{a}	0.4^{a}	5.8^{a}
None	None	1.82^{ab}	29.4^{bc}	16.13^{c}	5.2^{a}	0.3^{a}	0.2^{a}	5.7^{a}
LSD (P = 0.05)		.092	2.41	.860	NS[2/]	NS	NS	NS
P > F		.0001	.0396	.0016	.3328	.1295	.5893	.1066

Means in a column followed by the same letter are not significantly different by ANOVA.

[1/]Centric 40WG (1.25 oz/acre) applied on 4/23 (square week 2), 4/30 (square week 3), 5/8 (square week 4), and 5/14 (square week 5). Ethephon (6.4 oz/acre) and thidiazuron (1.00 ppm) were applied one time on 4/23.

[2/]NS = Not Significant

Table 3. Boll production per plant and percentage fruit retention on cotton treated with insecticide for fleahopper and/or treated with chemicals affecting plant growth, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Chemical[1/]		No. bolls by branch group		% boll retention by branch group		No. bolls/plant by fruit position		% boll retention by fruit position	
Insecticide	Plant growth chemical	1-5	6-10	1-5	6-10	1	2	1	2
Centric	None	4.8^{a}	0.8^{b}	33.8^{a}	10.1^{abc}	4.6^{a}	0.9^{a}	48.7^{a}	10.5^{a}
Centric	Ethephon	3.5^{b}	0.8^{b}	24.0^{b}	9.6^{abc}	3.1^{b}	1.1^{a}	35.0^{b}	12.0^{a}
Centric	Thidiazuron	4.9^{a}	0.5^{b}	35.8^{a}	5.2^{c}	4.7^{a}	0.7^{a}	48.7^{a}	7.8^{a}
None	Ethephon	3.0^{b}	1.6^{a}	20.4^{b}	14.1^{a}	3.2^{b}	1.2^{a}	33.9^{b}	12.5^{a}
None	Thidiazuron	4.8^{a}	0.6^{b}	32.7^{a}	6.4^{bc}	4.7^{a}	0.5^{a}	47.9^{a}	6.0^{a}
None	None	4.9^{a}	0.6^{b}	36.1^{a}	11.0^{ab}	4.6^{a}	0.7^{a}	50.5^{a}	9.5^{a}
LSD (P = 0.05)		.75	.54	5.98	5.08	.96	NS[2/]	7.74	NS
P > F		.0001	.0050	.0001	.0242	.0038	.1301	.0005	.2033

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) applied on 4/23 (square week 2), 4/30 (square week 3), 5/8 (square week 4), and 5/14 (square week 5). Ethephon (6.4 oz/acre) and thidiazuron (1.00 ppm) were applied one time on 4/23.
[2/]NS = Not Significant

Table 4. Fiber characteristics and lint production of cotton treated with insecticide for fleahopper and/or treated with chemicals affecting plant growth, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Chemical[1/]		Fiber Characteristics					Lint
Insecticide	Plant growth chemical	mic	lgth	unif	str	% elong	lb/acre
Centric	None	4.2[a]	0.98[a]	82.7[b]	30.4[a]	9.2[a]	536[a]
Centric	Ethephon	4.5[a]	0.94[a]	82.4[b]	29.6[a]	9.4[a]	317[b]
Centric	Thidiazuron	4.2[a]	0.99[a]	82.7[b]	30.3[a]	9.2[a]	558[a]
None	Ethephon	4.4[a]	0.87[a]	82.4[b]	29.5[a]	9.1[a]	313[b]
None	Thidiazuron	4.2[a]	1.01[a]	84.3[a]	30.9[a]	9.2[a]	528[a]
None	None	4.2[a]	0.99[a]	82.7[b]	29.5[a]	9.0[a]	547[a]
LSD (P = 0.05)		NS[2/]	NS	0.99	NS	NS	45.7
P > F		.0799	.0835	.0092	.4633	.7809	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Centric 40WG (1.25 oz/acre) applied on 4/23 (square week 2), 4/30 (square week 3), 5/8 (square week 4), and 5/14 (square week 5). Ethephon (6.4 oz/acre) and thidiazuron (1.00 ppm) were applied one time on 4/23.
[2/]NS = Not Significant.

EVALUATION OF INSECTICIDE OVERSPRAY ON BT COTTON

Texas A&M AgriLife Research and Extension Center, Nueces, County, TX

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SUMMARY: Caterpillars and damage to squares and bolls in Phytogen 367WRF cotton were almost nonexistent throughout a 7-week inspection period. Following application of the test insecticide treatments a spider mite infestation developed, but treatment was not needed as the population declined rapidly. Boll feeding true bug evidence of internal feeding was measured at 24% which required one treatment with Bidrin. No differences were found in cotton fiber characteristics or lint production. Lint yields were very high averaging 2,182 lb/acre (4.545 bales/acre). Numerically, all insecticide treatments produced more lint than the untreated cotton.

OBJECTIVES: The test was conducted to determine if insecticide treatments had effect on Bt cotton lint production with or without pest caterpillars or their damage.

MATERIALS/METHODS: Phytogen 367WRF variety cotton was planted on April 5, 2012 at the Texas A&M AgriLife Research and Extension Center at Corpus Christi, Texas. The seed was planted at 4/row foot with a John Deere 6100 planter. Insecticide overspray of the entire test area included (1) Centric 40WG (1.25 oz/acre) for cotton fleahopper on 4/24, 5/8, 5/22, and 5/30; and (2) Bidrin 8E (8.0 oz/acre) for boll feeding true bugs on 7/7 (evidence of internal feeding by the bugs on bolls was 24%).

Test insecticide treatments included Prevathon, Belt, Besiege, and Mustang Max. These treatments were applied to plots of 4 rows by 35 feet, and the test was arranged in a randomized complete block experimental design with 4 replications of the treatments. The experimental treatments were applied with a Spider Trac sprayer calibrated to deliver 8.4 gpa total volume through 8X hollow cone nozzles (2/row) at 45 psi traveling at 5.0 mph. These treatments were made on 6/14 late in the 2nd week of bloom. Up until that time the field had been inspected for the presence of caterpillar pests. Since an infestation did not develop the treatments were applied automatically without evidence of target pests.

The crop was grown under surface applied drip irrigation (8.0 inches), received approximately 8.0 inches of rainfall during the growing season, and the soil probably had a full moisture profile at planting due to the low lying field location. With the high yield potential expected due to available irrigation, fertilizer was applied at 138-69-0 + 4 zinc. Defoliants Ginstar + Dropp + Finish were applied on 8/8.

Treatments were assessed by (1) examining 20 plants/plot for Lepidoptera eggs, larvae, and damaged fruit [squares and/or bolls] on 5/26, 6/2, 6/11, 6/16, 6/22, 7/3, and 7/10; (2) rating plots for spider mite damage on 6/22, 6/25 and 7/3 where 1 = no leaf discoloration up to 5 = severe leaf discoloration and desiccation; and (3) harvesting the center 2 rows in each plot with 2-row John Deere model 9900 spindle picker. Seed cotton was processed on a 10-saw Eagle gin to determine lint percentage, and a sample was sent to the International Textile Center, Lubbock, Texas to determine fiber characteristics.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance (ANOVA), and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: Plants were examined each week for seven weeks for the presence of insects, especially caterpillars. Their numbers were very low; the total number of caterpillar eggs, larvae, and damage is provided (Table 1). The table shows the cumulative count for a 7-week period. Although there were statistical differences in the number of eggs, no reason for the differences were apparent other than the fact that significantly greater numbers of the caterpillar eggs were found in the two synthetic pyrethroid treatments. The number of larvae and damaged fruit was very low; the sum of their numbers for all inspection dates was 2 caterpillars and 1 damaged boll. These numbers are the lowest that I have ever observed in cotton. Nearby pheromone trap numbers for bollworm and tobacco budworm were also the lowest ever recorded at this location.

Spider mites caused enough damage to be noticeable; therefore, damage ratings were made 8, 11, and 19 days after the overspray insecticide treatments were applied (Table 1). No differences were observed in damage ratings among the various treatments.

Twenty four percent of bolls 0.9-1.1 inches in diameter showed evidence of internal feeding by true bugs (leaffooted bug, conchuela stink bug, and brown stink bug) on 7/2 (18 days after the overspray treatments were applied). Bidrin was applied on 7/7 to reduce their numbers. It is not know if the overspray insecticide treatments had an effect on the true bug infestation in plots since boll feeding was not measured in all plots; 100 bolls were collected and examined in a random fashion across the test location.

Statistical differences were not found in fiber characteristics or lint production (Table 2). Fiber micronaire, staple length, uniformity, and strength readings were excellent across the test. Lint production was very high ranging from 2,022 to 2,246 lb lint per acre, but statistically significant differences were not found. However, all insecticide treatments produced numerically more lint than did the untreated cotton. Numerically, the lint increase in the overspray treatments averaged 192 lb lint/acre more than the untreated cotton.

ACKNOWLEDGMENTS: Cotton Incorporated is acknowledged for providing grant funds for the study, and Stephen Biles, Extension Agent-IPM is thanked for administrating the grant in Texas. Special thanks are extended to Rudy Alaniz and to Clint Livingston, Demonstration Assistants, for their help in producing the crop. Dan Fromme, Extension Agronomist, is thanked for providing the location for the test.

Table 1. Lepidoptera eggs, larvae and damaged bolls, and spider mite damage in Phytogen 367WRF variety cotton oversprayed with insecticide, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Sum of counts over 7 weeks[1/]			Spider mite damage rating[4/]
	eggs[2/]	larvae	da bolls	
Prevathon 0.43SC (14.0 oz/acre)	1.3[c]	0.3[a]	0.0[a]	3.1[a]
Belt 4SC (3.0 oz/acre)	1.0[c]	0.0[a]	0.0[a]	2.4[a]
Belt 4SC + Mustang Max 0.8EC (2.0 + 3.6 oz/acre)	3.3[ab]	0.0[a]	0.0[a]	2.7[a]
Besiege 1.252 ZC (8.0 oz/acre)	1.0[c]	0.0[a]	0.0[a]	2.3[a]
Mustang Max 0.8EC (3.6 oz/acre)	4.8[a]	0.3[a]	0.0[a]	3.0[a]
Untreated	2.3[bc]	0.0[a]	0.3[a]	2.5[a]
LSD (P = 0.05)	1.76	NS[3/]	NS	NS
P > F	.0019	.5988	.4509	.8563

Means in a column followed by the same letter are not significantly different by ANOVA.

[1/] A total of 20 plants in each plot were examined each week for 7 weeks for a cumulative total of 140 plants per plot.

[2/] Eggs consisted of 96% cotton square borer and 4% bollworm.

[3/] NS = Not Significant.

[4/] Average of damage ratings on 6/22, 6/25 and 7/3. Ratings range from 1= no leaf discoloration up to 5 = severe leaf discoloration/desiccation, mites and webbing.

Table 2. Cotton fiber characteristics and lint production in Phytogen 367WRF variety cotton oversprayed with insecticide, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment	Cotton fiber characteristics					Yield
(rate)	micronaire	length	uniformity	strength	elongation	lb lint/acre
Prevathon 0.43SC (14.0 oz/acre)	4.5[a]	1.17[a]	84.3[a]	32.5[a]	8.9[a]	2222[a]
Belt 4SC (3.0 oz/acre)	4.7[a]	1.15[a]	84.3[a]	32.7[a]	9.0[a]	2209[a]
Belt 4SC + Mustang Max 0.8EC (2.0 + 3.6 oz/acre)	4.5[a]	1.19[a]	85.8[a]	33.8[a]	8.8[a]	2200[a]
Besiege 1.252 ZC (8.0 oz/acre)	4.4[a]	1.18[a]	84.7[a]	32.8[a]	8.8[a]	2246[a]
Mustang Max 0.8EC (3.6 oz/acre)	4.5[a]	1.19[a]	85.7[a]	33.4[a]	8.7[a]	2192[a]
Untreated	4.4[a]	1.20[a]	85.6[a]	33.1[a]	8.7[a]	2022[a]
LSD (P = 0.05)	NS[1/]	NS	NS	NS	NS	NS
P > F	.4432	.3641	.1433	.4844	.9156	.6458

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]NS = Not Significant.

MONITORING OF INSECTS IN COMMERCIAL FIBERMAX AND TWIN LINK COTTON VARIETIES

Texas A&M AgriLife Research and Extension Center, Nueces County, 2012

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SUMMARY: The low infestation rate of caterpillar pests which were also observed in adjacent non-Bt cotton prevented screening of the cotton varieties for differences in susceptibility to these insects. Even though eggs of bollworm and cotton square borer were readily found, no larvae were detected in the study, and only two damaged squares were found in the cotton.

OBJECTIVE: Determine if there are differences in development of Lepidoptera pests in the various FiberMax Bt cotton varieties.

MATERIALS/METHODS: Cotton varieties were monitored for caterpillar eggs, larvae, and damaged fruit beginning one week before bloom and continuing until near cutout. Twenty plants, squares, and bolls were examined at weekly intervals in the center two rows of plots. During examination other pest arthropod activity was also monitored to include spider mites and plant bugs (leaffooted bug, conchuela stink bug, brown stink bug). Monitoring of the plant bugs resulted in overspray of the test site on July 7 with Bidrin 8E (8.0 oz/acre) when evidence of internal feeding in 0.9-1.1 inch bolls reached 20%.

Early in the season the cotton test was oversprayed 4/24, 5/8, 5/22, and 5/30 with Centric 40WG for cotton fleahopper. These treatments reduced the natural enemy (predator) population, but these beneficial arthropods soon rebounded to very high numbers

RESULTS/DISCUSSION: Caterpillar pests detected included bollworm and cotton square borer eggs, but no larvae of either species were found in the cotton on any inspection date (Table 1). Only on one inspection date was any damage to fruit detected, and in that case it amounted to 2 damaged squares out of a total of 640 examined across the test on that date (Table 2). It should be noted that pheromone traps monitored nearby for bollworm and tobacco budworm captured the lowest number of any year since trapping began over two decades ago.

Additional arthropod monitoring resulted in detection of spider mites for which it appeared for a while that a treatment might be need across the entire test (Table 3). Their numbers did decline and the treatment was never made. Leaffooted bug counts were made during examination of plants on 7/2, and results of those counts are shown in Table 3. Additional information concerning the plant bugs is provided in the materials/methods section.

ACKNOWLEDGMENTS: Thanks are extended to Bayer CropScience for their support of the experiment and to Rudy Alaniz and Clint Livingston, Demonstration Assistants, for their help with production practices.

Table 1. Bollworm and cotton square borer eggs, and Lepidoptera larvae in commercial Fibermax and Twin Link cotton varieties, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

	Number of eggs per 20 plants											No. of larvae per 20 plants					
	Bollworm						Cotton square borer										
Variety	5/26	6/2	6/16	6/22	7/2	7/10	6/11	6/16	6/22	7/2	7/10	5/26	6/2	6/11	6/16	7/2	7/10
FM 1944GLB2	.5	.5	1.5	0	0	0	.3	.8	.5	0	0	0	0	0	0	0	0
BX 1331GLT	0	.5	.5	0	0	0	.5	0	.3	0	0	0	0	0	0	0	0
BX 1332GLT	0	0	.5	0	0	0	.3	.8	0	0	0	0	0	0	0	0	0
BX 1333GLT	0	.5	.5	.3	0	0	.3	.8	.5	0	0	0	0	0	0	0	0
BX 1334GLT	0	0	.3	.3	0	0	.8	.3	.8	0	0	0	0	0	0	0	0
BX 1335GLT	0	1.0	.3	.5	0	0	.8	2.0	0	0	0	0	0	0	0	0	0
FM 2989GLB2	0	0	.3	0	0	0	.5	1.5	.3	0	0	0	0	0	0	0	0
FM 8270GLB2	.5	.5	.8	.3	0	0	1.5	.8	.5	0	.8	0	0	0	0	0	0
LSD (P=0.05)	NS[1/]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
P > F	.58	.60	.70	.51	1.0	1.0	.17	.17	.76	1.0	.06	1.0	1.0	1.0	1.0	1.0	1.0

Means in a column followed by the same letter are not significantly different by ANOVA.

[1/] NS = Not Significant

Table 2. Lepidoptera damaged squares and bolls in commercial Fibermax and Twin Link cotton varieties, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

	Number damaged per 20												
	Squares						Bolls						
Variety	5/26	6/2	6/11	6/16	6/22	7/2	6/11	6/16	6/22	7/2	7/10	7/17	7/24
FM 1944GLB2	0	0	0	0	0	0	0	0	0	0	0	0	0
BX 1331GLT	0	0	0	0	0	0	0	0	0	0	0	0	0
BX 1332GLT	0	0	0	0	0	0	0	0	0	0	0	0	0
BX 1333GLT	0	0	0	0	0	0	0	0	0	0	0	0	0
BX 1334GLT	0	0	0	0	0	0	0	0	0	0	0	0	0
BX 1335GLT	0	0	0	0	0	0	0	0	0	0	0	0	0
FM 2989GLB2	0	0	0	0	.5	0	0	0	0	0	0	0	0
FM 8270GLB2	0	0	0	0	0	0	0	0	0	0	0	0	0
LSD (P=0.05)	NS[1/]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
P > F	1.0	1.0	1.0	1.0	.46	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/] NS = Not Significant

Table 3. Spider mite damage rating and leaffooted bugs in commercial Fibermax and Twin Link cotton varieties, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Variety	Mite damage rating[2/] 6/22	Mite damage rating[2/] 7/2	Leaffooted bugs/ 20 plants (7/2)
FM 1944GLB2	2.2[a]	1.3[a]	0.3[a]
BX 1331GLT	1.3[a]	1.1[a]	0.3[a]
BX 1332GLT	2.0[a]	1.3[a]	0.0[a]
BX 1333GLT	1.9[a]	1.3[a]	0.3[a]
BX 1334GLT	1.7[a]	1.4[a]	0.8[a]
BX 1335GLT	1.6[a]	1.5[a]	0.8[a]
FM 2989GLB2	1.6[a]	1.6[a]	0.3[a]
FM 8270GLB2	1.8[a]	1.8[a]	0.5[a]
LSD (P = 0.05)	NS[1/]	NS	NS
P > F	.8366	.5633	.3149

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/] NS = Not Significant
[2/] Spider mite damage ratings: 1 = no damage up to 5 = severe leaf desiccation.

BOLLWORM/TOBACCO BUDWORM PHEROMONE TRAP CAPTURE IN NUECES COUNTY DURING 2012

Texas A&M Agrilife Research and Extension Center, Nueces County, 2012

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SUMMARY: Both bollworm and tobacco budworm moth catches in traps were lower in 2012 compared with any previous year. The peak catch for bollworm moths was delayed two weeks compared with the previous two years. Tobacco budworm numbers never exceeded .64/trap per night except for the first trapping week. The lower catch for the budworm probably relates to fewer wild host plants and increased use of Bt cotton varieties.

OBJECTIVES: Trap catch data is collected to monitor relative abundance of the bollworm and tobacco budworm in the current season and to determine fluctuation of their populations during the current and previous seasons.

MATERIALS/METHODS: Moth-ZV 30-inch screen wire cone traps (Hartstack) were deployed April 17 and baited with pheromone for the bollworm and tobacco budworm at the Texas A&M AgriLife Research and Extension Center at Corpus Christi, Texas. Two traps were deployed for each species. Bollworm traps were monitored for 24 weeks, and tobacco budworm traps were monitored for 17 weeks. Moth numbers were recorded daily or every few days, and each 7-day catch total was divided by 7 to obtain the average daily catch for the corresponding period. Pheromone was changed monthly.

RESULTS/DISCUSSION: Bollworm moth trap captures were much lower in April and May compared to 2011 (Fig. 1). See the 2011 report for comparison. The peak number of moths captured in 2012 occurred in the first two weeks of June. The 2012 peak numbers were greatly reduced over the previous year (175 moths/night in 2011 compared to 48 moths/night in 2012). Overall bollworm moth trap captures were subsequently much lower than in the previous year which, in turn, was lower than in 2010. The lower catch in both 2011 and 2012 may have been associated with extended drought periods experienced in the area in both years. Similar data were obtained in 2009, another drought period. It was not until the first two weeks in October when moth numbers began to increase in traps. When trapping was terminated at the end of the second week of October bollworm moth numbers appeared to increasing.

Tobacco budworm moth capture never exceeded 1.79 per trap/night (Fig. 2). This number occurred in the last week of April, and along with 0.64 budworm moths per trap the very next week, it was the only periods in 2012 where their numbers were higher than in 2011. There has generally been a steady decline in tobacco budworm moths in the pheromone traps since 2004.

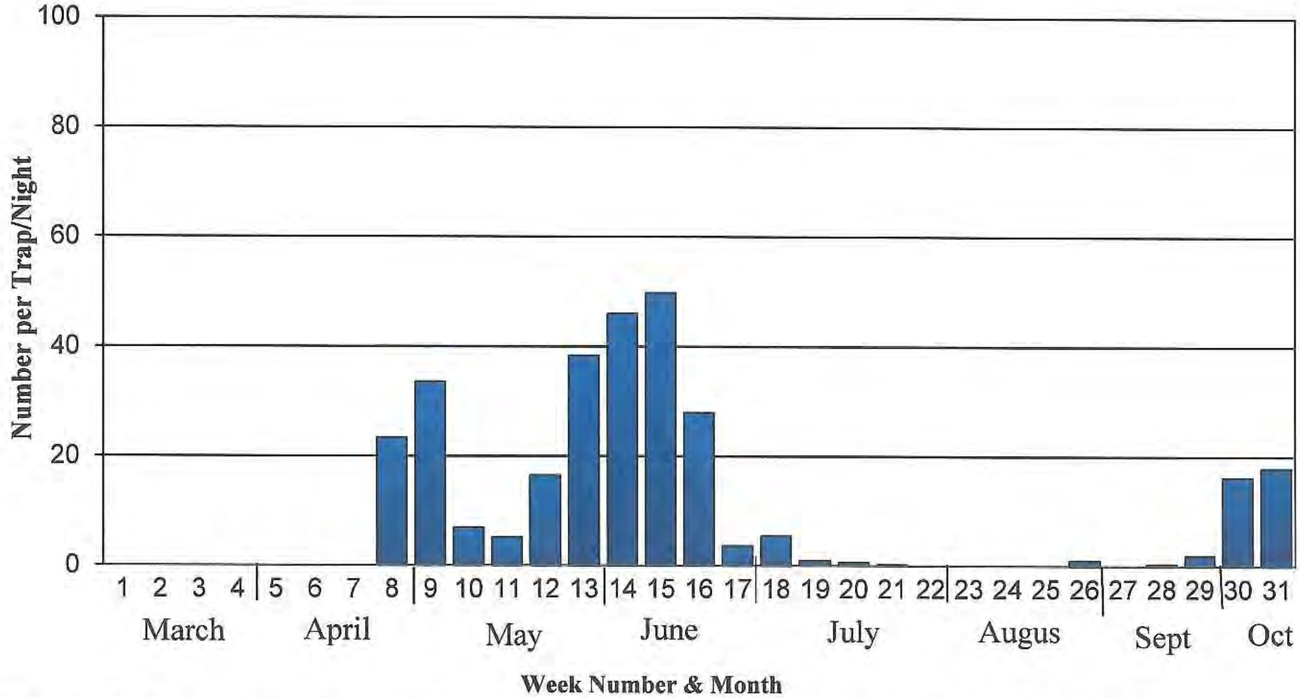

Fig. 1. Bollworm moths captured in pheromone traps per night for the indicated week, Nueces County, TX, 2012.

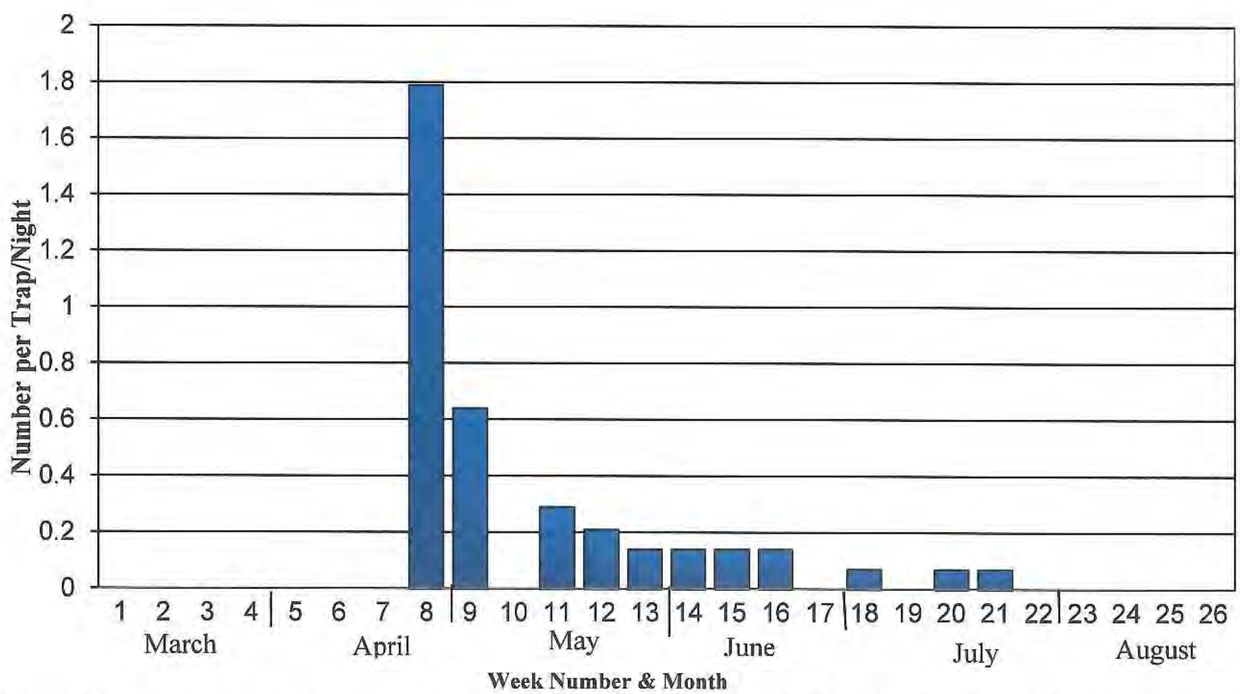

Fig. 2.Tobacco budworm moths captured in pheromone traps per night for the indicated week, Nueces County, TX, 2012.

AGRICULTURAL INFORMATION SOURCES

Nueces County Extension Agents Agriculture/Natural Resources
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