- 2003 -

Results of Insect Control Evaluations on Corn, Sorghum and Cotton in Texas Coastal Bend Counties & Coastal Bend Extension District Crop Hybrid/Variety Comparisons

Texas Cooperative Extension, Dr. Chester P. Fehlis, Associate Vice Chancellor and Director, The Texas A&M University System, College Station, Texas

PORTER FARM DEMONSTRATION: CENTENNIAL CELEBRATION

Conducting field experiments on a farmer's own land is one of the most rewarding aspects of a Cooperative Extension career. The model for Cooperative Extension work stems from an on-farm demonstration in 1903 by Dr. S. A. Knapp on the Walter C. Porter Farm near Terrell Texas.

Dr. Knapp, an experienced farmer, professor of agriculture, and teacher of new agricultural methods, was serving as USDA's Special Agent for Promotion of Agriculture in the south. He believed firmly that, for a farmer to see the value of a new idea, simply viewing the work on a government-owned farm wasn't enough. He must do it himself, on his own land, under his own conditions. In Dr. Knapp's words, "What a man hears, he may doubt, what he sees, he may possibly doubt. But what he does himself, he cannot doubt."

The Knapp-Porter Demonstration revolutionized the transfer of new agricultural methods from the researcher to the farmer, but it also represented the beginning of a century of Cooperative Extension - the cooperation among USDA, University educators, and County Extension Agents in each community to address local needs.

The year 2003 marks the 100th anniversary of the Knapp-Porter demonstration. In that tradition the contents of this report are presented.

FOREWORD

This report contains a summary of applied research/demonstration projects conducted by Texas Cooperative Extension dealing with the management of arthropod pests in the Coastal Bend Counties of Texas in 2003. It includes work with corn, sorghum, and cotton. Experiments were conducted with commercial agricultural producers in cooperation with county Extension agents, county row crop committees, agricultural consultants, and agribusiness companies. Nine of the experiments were conducted at the Texas Agricultural Experiment Station at Corpus Christi. The objectives of these studies were to find more cost effective ways to manage pests and to identify areas that require more study.

Coastal Bend farm cooperators are acknowledged for providing land, equipment, labor, time, ideas, and other assistance in support of these projects. The results obtained will be of benefit to all agricultural producers.

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System is implied. Readers should realize that results from one experiment may not represent conclusive evidence that the same response would occur where conditions vary.

A few reports contain calculations of added return over treatment costs based on numerical differences in yield. It must be kept in mind that the returns attributed to treatment are not absolute, i.e. the yield differences may have been the result of other variables not associated with the treatment. The reader should always consider the statistical analysis and data from multiple tests over space and time in making judgements concerning the economic returns.

Reports are also available at the following web site http://agfacts.tamu.edu/~rparker/rpmaster.htm. If you have comments or questions about the reports contained herein, contact:

Roy D. Parker
Professor and Extension Entomologist
Texas A&M University Agricultural
Research & Extension Center
10345 Agnes
Corpus Christi, Texas 78406-1412
(361) 265-9203 telephone
(361) 265-9434 fax
rd-parker@tamu.edu

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TRIBUTE TO THE BEHMAN BROTHERS FOUNDATION

The Behman Brothers Foundation has provided grant funds supporting Extension educational programs in production agriculture for over 24 years. As wise visionaries, the Behman Brothers desired to support improvements in Coastal Bend agriculture through various means. Because of their generosity, applied research has been greatly expanded. Behman funding has been used to purchase farm tractors, farming implements, sprayers, trailers to haul equipment, grain threshers, moisture meters, fertilizer spreaders, scales to weigh cotton and grain samples, repairs to our laboratory gin stands, and other items too numerous to mention. Some funding has also been applied to ensure that the equipment is properly cared for and operated, and it sustains a portion of the salary of a valued employee of 23 years. Behman Foundation funding has become so essential to the operation of the Teas Cooperative Extension program, that we recognize that virtually every demonstration or applied research project is assisted through it. The support by the Behman Brothers Foundation of agricultural productivity in South Texas is hereby acknowledged.

EFFECTIVENESS OF MONSANTO TRANSGENIC CORN ON MEXICAN CORN ROOTWORM WITH AND WITHOUT INSECTICIDE FOR CHINCH BUG CONTROL

Lawrence Hinze Farm, Lavaca County, 2003

Roy D. Parker and Shannon DeForest
Extension Entomologist and County Extension Agent, respectively
Corpus Christi and Hallettsville, Texas

SUMMARY: Mon 47835 seed treatments and Counter 20CR were effective in reducing chinch bug damage on both transgenic and non-transgenic corn hybrids based on damage rating, but no statistical differences were observed in actual chinch bug numbers 46 DAP. The transgenic hybrid was significantly more effective in protecting corn roots from Mexican corn rootworm compared with the other insecticide treatments as measured by the Iowa State 1-6 root-rating scale (old method). No differences were found in root damage in the comparison of seed treatment, Counter 20CR or Force 3G, but significantly greater damage was observed on non-transgenic corn with no insecticide treatment. No differences were found using the Iowa State 0-3 node-injury scale (new method) with transgenic hybrid, seed treatment, Counter 20CR or Force 3G. With the new scale, only non-transgenic untreated corn sustained significantly more root damage.

OBJECTIVES: The field study was established to evaluate transgenic corn developed for control of certain corn rootworm species to compare it with granular and seed treatments, and to evaluate a systemic seed treatment on the transgenic corn.

MATERIALS/METHODS: Monsanto corn hybrids were planted on the Lawrence Hinze "Home Place" in Lavaca County east of Texas Highway 95 on FM 1891 on Mar 13 with a 2-row John Deere 7100 planter equipped with cones to distribute the seed in 4-row by 25 ft plots. Treatments were arranged in a randomized complete block design with 4 replications. Granular insecticide was distributed in a T-band over the open seed furrow. Thirty eight seed were planted in each row of the 25 ft plots into wet soil which was 63°F at the 4-inch depth. Rows were spaced 38 inches apart. Corn had been grown on the site for at least 6 years. The sandy clay loam soil (55% sand, 14% silt and 31% clay) contained 1.5% organic matter with a 7.6 pH. Fertilizer was 99-27-9+9S and 2 qt of 15% zinc. One day following treatment Roundup (1 qt/acre) + Dual II Magnum (1.5 pt/acre) + Atrazine (1 qt/acre) was broadcast with a 2-row backpack sprayer.

Treatments were assessed by (1) counting the number of plants on 10 row ft in each of the center two rows on Apr 9 or 27 days after planting [DAP], (2) assigning a damage rating to each plot 27, 40 and 46 DAP [1 = no damage up to 5 = severe stunting, dead plants and uneven growth caused primarily by chinch bugs], (3) digging 3 plants from each of the center 2 rows in plots on May 13 for rootworm damage rating using the Iowa State 1 - 6 root rating scale [1 = no visible damage up to 6 = 3 or more nodes of roots eaten within 1.5 inches of the stalk] and the new 0 - 3 node-injury scale [0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes so eaten, and 3 = 3 or more nodes so eaten], and (4) counting lodged plants [leaning 30° or greater] by examining 10 plants at 3 locations in each plot on May 21.

RESULTS/DISCUSSION: Plant damage ratings were made 27, 40 and 46 days after planting which was primarily a measure of chinch bug damage (Table 1). Mon 47835 seed treatments and Counter 20CR were effective in reducing chinch bug damage on both transgenic and non-transgenic corn hybrids, but statistical differences were not found in chinch bug numbers 46 DAP. Chinch bug numbers were highly variable in plots resulting in wide variation within the same treatment.

Differences were not found in final plant stands (Table 2). Plant lodging caused by Mexican corn rootworm was significantly lower in transgenic, Mon 47835 seed treatment, Counter 20CR and Force 3G treated corn plots. In these plots lodging was less than 1%. Non-transgenic corn without insecticide treatment sustained 47.5% lodging. Mexican corn rootworm damage to the root system was significantly lower in transgenic corn plots compared with the other treatments, and the insecticide treatments had significantly less rootworm damage compared to non-transgenic untreated cotton (Iowa State 1-6 root-rating scale). Insecticide treated and transgenic corn treatments sustained less rootworm damage than non-transgenic corn as measured with the Iowa State 0-3 node-injury scale. Combination treatments of a transgenic hybrid plus an at-planting insecticide is suggested to cover a wider insect pest spectrum. Additional experiments will be required to determine yield performance as commercial hybrids enter the market in 2004.

ACKNOWLEDGMENTS: The Monsanto Company is acknowledged for their support of this project. Thanks are extended to Mr. & Mrs. Lawrence Hinze for their interest, assistance in making evaluations, land, and equipment in conduct of the study. Hopkins Agricultural Services is thanked for use of their two row planter and cone seed distributors.

Table 1. Chinch bug damage and numbers on transgenic and non-transgenic corn hybrids developed for Mexican corn rootworm control compared with various seed or granular insecticide treatments, Lawrence Hinze Farm, Lavaca County, TX, 2003.

Hybrid	Insecticide & rate	Plant da. rating on DAP[a]			Chinch bug per 10 plants[b]
		27	40	46	
Transgenic		3.0 a	2.7 a	2.0 b	15.5 a
Transgenic	Mon 47835 (0.25 mg AI/seed)	1.3 b	1.4 bc	1.1 b	8.8 a
Non-transgenic	Mon 47835 (1.25 mg AI/seed)	1.3 b	1.1 c	1.3 b	16.0 a
Non-transgenic		2.9 a	2.3 a	3.3 a	27.0 a
Non-transgenic	Counter 20CR (6 oz/1000 ft)	1.3 b	1.9 ab	2.3 ab	21.5 a
Non-transgenic	Force 3G (5 oz/1000 ft)	2.5 a	2.1 ab	1.5 b	10.3 a
LSD (P = 0.05)		0.571	0.785	1.167	NS
P > F		.0001	.0073	.0139	.2983

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

[a] Plant damage ratings primarily for chinch bug range from 1 = no damage up to 5 = severe stunting, uneven plant growth and unhealthy color. DAP = days after planting.

[b] Chinch bug counts made on Apr 28 or 46 DAP

Table 2. Evaluation of a transgenic corn hybrid for control of Mexican corn rootworm, Lawrence Hinze Farm, Lavaca County, TX, 2003.

Hybrid	Insecticide & rate	Plants (1000's/ acre)	% lodged plants[a]	Root damage ratings (Mexican corn rootworm) Old[b]	New[c]
Transgenic		17.0 a	0.8 b	1.26 c	0.016 b
Transgenic	Mon 47835 (0.25 mg AI/seed)	17.9 a	0.0 b	1.16 c	0.011 b
Non-transgenic	Mon 47835 (1.25 mg AI/seed)	17.2 a	0.8 b	2.86 b	0.205 b
Non-transgenic		17.4 a	47.5 a	4.05 a	1.135 a
Non-transgenic	Counter 20CR (6 oz/1000 ft)	17.2 a	0.0 b	2.42 b	0.106 b
Non-transgenic	Force 3G (5 oz/1000 ft)	19.8 a	0.8 b	2.25 b	0.129 b
LSD (P = 0.05)		NS	15.91	0.696	0.5264
P > F		.2385	.0001	.0001	.0028

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

[a] Plants leaning greater than 30° by examining 10 plants in 3 locations in each plot.

[b] Old method - Iowa State 1 - 6 root-rating scale: 1 = no visible feeding damage up to 6 = 3 or more nodes of roots eaten to within 1.5 inches of the stalk.

[c] New method - Iowa State 0 - 3 node-injury scale: 0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes of roots eaten, and 3 = 3 or more nodes of roots eaten.

EVALUATION OF INSECTICIDES FOR CONTROL OF CHINCH BUG AND MEXICAN CORN ROOTWORM ON CORN

Lawrence Hinze Farm, Lavaca County, 2003

Roy D. Parker and Shannon DeForest
Extension Entomologist and County Extension Agent, respectively
Corpus Christi and Hallettsville, Texas

SUMMARY: Chinch bugs were effectively controlled by the seed treatments Prescribe, Poncho and Cruiser. For some reason high numbers of chinch bugs were found in the Cruiser plots 42 DAP, but damage ratings reflected excellent control of the pest. Aztec was not as effective on chinch bugs, but it was very effective on Mexican corn rootworm. Aflatoxin readings were highest in Aztec and untreated corn with a trend that appeared to reflect chinch bug damage. Returns due to insecticides ranged from $24.05/acre (Aztec) up to $41.64/acre (Prescribe).

OBJECTIVE: The field experiment was designed to measure the effectiveness of insecticide treatments in corn on chinch bug and Mexican corn rootworm.

MATERIALS/METHODS: B&H 8881 RR hybrid corn was planted on the Lawrence Hinze "Home Place" in Lavaca County east of Texas Highway 95 on FM 1891 on Mar 14, 2003 with a 4-row IH87 blackland planter equipped with Noble granular boxes. The seeding rate was 19,000/acre. Treatments were arranged in a randomized complete block design with 3 replications of each treatment in 4-row plots ranging in size from 0.26 - 0.29 acres each. Rows were spaced on 38-inch centers. Corn had been grown on the site for at least 6 years. The sandy clay loam soil (55% sand, 14% silt and 31% clay) contained 1.5% organic matter with a 7.6 pH. Soil moisture at planting was excellent, and soil temperature was 64°F at the 4-inch depth. Fertilizer was 99-27-9+9S and 2 qt of 15% zinc. Herbicide consisted of Atrazine (1.5 pt/acre) in a 12-inch band at planting and Roundup Ultra (1.0 pt/acre + Distinct 3.5 oz/acre) on Apr 28. Granular Aztec was applied in-furrow.

Treatments were assessed by (1) counting the number of plants on 13.75 ft row on each of the center 2 rows of plots on Apr 9, (2) counting chinch bugs by digging around 20 plants in the center 2 rows of plots on Apr 9 [26 DAP=days after planting] and on Apr 25 [42 DAP], (3) assigning a chinch bug plant damage rating [1 = no damage up to 5 = severe stunting and plant death] on Apr 9 and 25, (4) digging 6 plants from the center 2 rows in each plot on May 8 for rootworm damage rating using the Iowa State 1 - 6 root- rating scale [1= no visible damage up to 6 = 3 or more nodes of roots eaten within 1.5 inches of the stalk] and the new 0-3 node-injury scale [0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes so eaten, and 3 = 3 or more nodes so eaten], (5) harvesting entire plots with a commercial machine on Jul 31, and (6) using a Vicam aflatoxin testing kit [AflaTest-P] to measure aflatoxin from a corn sample in each plot of 2 replications [samples were frozen until tested]. Grain weights were adjusted to a standard at 15% moisture.

RESULTS/DISCUSSION: Plant stands were not affected by treatments, but significant differences were observed due to insecticide treatment in chinch bug numbers and plant damage (Table 1). Although statistical differences were not observed in chinch bug counts 26 DAP, numerically the systemic seed treatments contained many fewer chinch bugs. By 42 DAP, Poncho and Prescribe treated corn plots had significantly fewer chinch bugs compared to the untreated plots. Damage ratings 26 DAP showed that all the systemic seed treatments (Prescribe, Poncho and Cruiser) had significantly better ratings than did corn in Aztec and untreated plots. The same results were found 42 DAP, except by that time Aztec treated corn had significantly less damage than the untreated corn.

Mexican corn rootworm damage to roots was significantly lower in all insecticide treatments (Table 2) and Aztec treated corn roots had statistically less damage than all other treatments as measured by the Iowa State 1-6 root-rating scale (old method) and numerically less than all other treatments as measured by the Iowa State 0-3 node-injury scale (new method). Aflatoxin level was significantly less in the Prescribe treatment compared with untreated corn, but the level was not statistically different than that in Poncho or Cruiser treatments. We are unsure how the aflatoxin results should be interpreted.

Insecticide treated corn produced significantly greater yield than the untreated corn (Table 2). Although not statistically lower in yield compared with the seed treatments, Aztec yields were numerically much lower compared to the other insecticide treatments (within 1 bu/acre of statistical separation of 2 treatments). Returns due to insecticide use (costs were product, harvesting/hauling the extra yield made and application cost of Aztec) ranged from $24.05 up to $41.64/acre. We conclude that the seed treatments were superior to Aztec on chinch bugs, but Aztec is probably more effective in controlling Mexican corn rootworm under heavy pest pressure.

ACKNOWLEDGMENTS: The support of Gustafson, Syngenta Crop Protection and Bayer CropScience companies is appreciated. A special thanks is extended to B-H Genetics for their support in providing planting seed and continued interest in the experiment. Thanks are expressed to Mr. & Mrs. Lawrence Hinze for their interest, assistance in making counts, land and equipment in conduct of the field study. We acknowledge Victor Eder, Garst Seed Company, for providing the electronic scale at harvest.

Table 1. Chinch bug numbers and plant damage in corn treated with seed and granular formulations of insecticide, Lawrence Hinze Farm, Lavaca County, TX, 2003.

Treatment (Rate)	Plants (1000's/acre)	Chinch bugs/20 plants		Plant damage rating [b]	
		26 DAP[a]	42 DAP	26 DAP	42 DAP
Prescribe 600FS (1.36 mg/seed)	15.7 a	2.7 a	22.0 bc	1.00 b	1.00 c
Poncho 600FS (1.25 mg/seed)	17.3 a	2.7 a	12.7 c	1.00 b	1.17 c
Cruiser 5FS (1.25 mg/seed)	15.8 a	3.3 a	52.0 ab	1.00 b	1.33 c
Aztec 2.1G (6.7 oz/1000 ft)	16.7 a	9.3 a	45.3 ab	2.75 a	2.50 b
Untreated	16.3 a	10.3 a	56.0 a	2.50 a	3.50 a
LSD (P = 0.05)	NS	NS	31.2	.494	.739
P > F	.6969	.2529	.0447	.0001	.0002

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

[a] DAP = days after planting

[b] Plant damage ratings primarily for chinch bug range from: 1 = no damage up to 5 = severe stunting, uneven plant growth and poor plant color.

Table 2. Mexican corn rootworm damage, aflatoxin levels, yield, and dollar return in corn treated with seed and granular formulations of insecticide, Lawrence Hinze Farm, Lavaca County, TX, 2003.

Treatment (Rate)	Root damage ratings (Mexican corn rootworm)		Aflatoxin (ppb)	Yield (bu/acre)	$ return over untreated[c]
	Old[a]	New[b]			
Prescribe 600FS (1.36 mg/seed)	3.54 b	0.67 b	9 c	63.0 a	41.64
Poncho 600FS (1.25 mg/seed)	3.03 b	0.27 c	29 bc	63.2 a	41.10
Cruiser 5FS (1.25 mg/seed)	3.04 b	0.27 c	29 bc	58.0 a	31.23
Aztec 2.1G (6.7 oz/1000 ft)	2.24 c	0.09 c	56 a	54.9 a	24.05
Untreated	4.81 a	1.92 a	50 ab	36.6 b	
LSD (P = 0.05)	.703	.387	24.9	8.77	
P > F	.0004	.0001	.0153	.0006	

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

[a] Old method - Iowa State 1 - 6 root-rating scale: 1 = no visible feeding damage up to 6 = 3 or more nodes of roots eaten to within 1.5 inches of the stalk.

[b] New method - Iowa State 0 - 3 node-injury scale: 0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes of roots eaten, and 3 = 3 or more nodes of roots eaten.

[c] Corn value based on $2.40/bu; costs include Prescribe ($12.11/acre), Poncho ($13.06/acre), Cruiser ($12.34/acre), and Aztec ($12.96/acre). Harvesting/hauling cost was calculated at $0.65/cwt. Cost of applying Aztec was figured at $0.25/acre.

COMPARISON OF AT-PLANTING INSECTICIDES ON CORN

Bart L. Hajovsky Farm, Wharton County, 2003

Roy D. Parker and Dan D. Fromme
Extension Entomologist and Extension Agent - IPM, respectively
Corpus Christi and Wharton, Texas

SUMMARY: Average chinch bug numbers within treatments were moderate, but there were areas in plots where more damage was evident especially as viewed from harvesting equipment. Numerically, chinch bugs were near treatment threshold only in untreated corn, but yields were significantly greater for all insecticide treatments compared to untreated corn. Dollar returns ranged from $9.03/acre (Aztec) up to $25.09/acre (Prescribe). Poncho at the low rate provide a greater dollar return/acre than at the high rate ($24.56 compared with $16.51).

OBJECTIVE: The experiment was conducted to compare insecticide seed and granular treatments for effectiveness on insect pests and to determine impact on yield.

MATERIALS/METHODS: B&H 8881RR hybrid corn was planted on the Bart Hajovsky Farm on land in Wharton County 0.6 mile from the intersection of FM 647 and County Road 336. Corn seed at 21,000 kernels/acre was planted in rows on 38-inch centers on Apr 4, 2003 with a 12-row John Deere Model 7300 MaxEmerge II Vacuum Planter. Plots were 6 rows wide by 800 ft long, and they were arranged in a randomized complete block design with 3 replications. Corn had been grown on the land for 6 years, but Mexican corn rootworm numbers had been judged to be relatively low. The loam soil (44% sand, 32% silt and 24% clay) contained 1.53 organic matter with a 4.8 pH. Soil temperature at the 3-inch depth-at planting was 73°F, moisture was excellent, and overall soil planting conditions were good. Atrazine 4 lb (1.0 qt/acre) and glyphosate 4 lb (1.0 qt/acre) were broadcast at-planting. Granular Aztec was distributed over the seed furrow with John Deere banders.

Treatments were assessed by (1) counting the number of plants in 13.75 ft row on each of the two center rows in plots on April 21, (2) counting the number of chinch bugs on and around the base of 10 plants/plot on April 25, (3) digging 6 plants per plot in untreated corn to determine damage by Mexican corn rootworm (since very little damage was observed roots were not evaluated from other treatments), and (4) harvesting 0.368 acres in each plot with a commercial machine on August 20 for yield determination. Grain weights were adjusted to 15% moisture.

RESULTS/DISCUSSION: Statistical differences were not observed in plant population or chinch bug numbers (Table 1). Numerically, more chinch bugs were counted in untreated plots. The insects appeared to be clumped resulting in great variation in the chinch bug counts within a treatment. Damage areas were especially apparent as observed from harvest equipment. Several areas in untreated plots appeared to have been affected by chinch bugs. Yields were significantly lower in the untreated corn compared with all other treatments. Aztec treated corn had significantly lower yield than the Prescribe treatment which probably reflects reduced effectiveness of Aztec on chinch bug. All insecticide treatments provided an economic return. It ranged from $9.03/acre for Aztec to $25.09/acre for Prescribe.

ACKNOWLEDGMENTS: Thanks are extended to the Bart Hajovsky Family and B-H Genetics for providing equipment, labor and land. We appreciate the support of Gustafson, Syngenta Crop Protection and Bayer CropScience Companies for their support.

Table 1. Evaluation of insecticide seed and granular treatments applied to corn. Bart Hajovsky Farm, Wharton County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	Chinch bugs per 10 plants	Yield (bu/acre)	$ return over untreated[a]
Prescribe 600FS (1.36 mg/seed)	19.7 a	0.0 a	53.3 a	25.09
Cruiser 5FS (1.25 mg/seed)	21.5 a	0.0 a	46.4 b	10.80
Poncho 600FS (0.25 mg/seed)	21.8 a	0.3 a	49.3 ab	24.56
Poncho 600FS (1.25 mg/seed)	21.5 a	0.7 a	49.6 ab	16.51
Aztec 2.1G (6.7 oz/1000 ft)	22.0 a	2.7 a	45.2 b	9.03
Untreated	22.8 a	6.7 a	34.4 c	
LSD (P = 0.05)	NA	NA	4.87	
P > F	.2578	.1361	.0001	

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

[a] Corn value based on $2.40/bu; costs include Prescribe ($13.39/acre), Cruiser ($13.63/acre), Poncho (0.25 mg/seed = $5.78/acre and 1.25 mg/seed = $14.44/acre), and Aztec ($12.96/acre). Harvesting/Hauling cost was calculated at $0.65/cwt. Cost of applying Aztec was estimated to be $0.25/acre.

COMPARISON OF GRANULAR INSECTICIDES AND EVALUATION OF AZTEC RATES FOR EFFECTIVENESS ON MEXICAN CORN ROOTWORM

Hernandez Farms, Goliad County, 2003

Roy D. Parker and Brian D. Yanta
Extension Entomologist and County Extension Agent, respectively
Corpus Christi and Goliad, Texas

SUMMARY: Counter 20CR, Aztec, Force, and Fortress treated corn sustained less damage from Mexican corn rootworm than untreated corn. Fortress was not as effective as other insecticides in protecting the root system (Iowa State 1-6 root-rating scale) and the same trend was noted using the Iowa State 0-3 node-injury scale. Untreated corn had significantly more chinch bugs present except for the Force treatment. Under heavy Mexican corn rootworm pressure, Aztec at 3 rates (100%, 75% and 50% of the labeled amount) were equally effective in protecting the root system. In the Aztec study, untreated corn sustained greater than 2 nodes of roots totally destroyed. Aztec reduced the damage to less than one root chewed to within 1.5 inches of the plant. However, for the second year in a row we were not able to obtain yield data due to drought and a hurricane

OBJECTIVE: The field study was established to measure the effectiveness of granular insecticides in reducing root damage from Mexican corn rootworm and to compare their effectiveness in reducing chinch bug numbers.

MATERIALS/METHODS **Test 1:** Pioneer 3223 hybrid corn was planted on the Hernandez Farm, "Pettus Place" near FM 2043 northwest of Goliad on Mar 11, 2003 with a 2-row John Deere 7100 planter equipped with cone seed distributors. The seeding rate about 27,000/acre and the experiment was replicated 3 times in a randomized complete block design. Plots were 4 rows wide on 38-inch centers with an average length of about 200 ft. Planting conditions consisted of 62°F soil temperature and wet soil. The clay loam soil (59% sand, 18% silt, and 23% clay) contained 1.6% organic matter and a 6.9 pH. Corn had been planted on the land for more than 5 years. Granular insecticides were placed in a T-band over the open seed furrow.

Fertilizer applied was 84-28-12. Herbicide applied the day of planting was Roundup (1 qt/acre) + Dual II Magnum (1.5 pt/acre) + Atrazine (1 qt/acre). Asana XL (3.2 oz/acre) was also applied with the herbicide for cutworm control. Accent (1.0 oz/acre) was applied on Apr 15 for Texas Panicum.

Treatments were accessed by (1) counting plants on 10 row ft at each of 2 locations in the center 2 rows of plots on Apr 15 [35 DAP = days after planting], (2) counting chinch bugs in the center 2 rows of plots, on 20 plants/plot on Apr 15, and (3) digging 6 roots/plot on May 9, cleaning with high pressure water stream, and evaluating these roots for Mexican corn rootworm damage [Iowa State 1-6 and 0-3 root damage scales].

Test 2: Pioneer 31B13 hybrid corn was planted next to test 1 on Mar 24, 2003 with a John Deere 7300 MaxEmerge plus planter. The seeding rate was 20,000/acre and the experiment was replicated 3 times in a randomized complete block design. Plots were 4 rows wide spaced 38 inches apart with a length of about 300 ft. Planting conditions consisted of 66°F soil temperature and excellent moisture. Soil characteristics were the same as in Test 1. Aztec was placed in a T-band over the open seed furrow. It was applied at 3 rates (100%, 75%, and 50% of the labeled rate).

Treatments were assessed by (1) counting plants as described for Test 1 on Apr 15 which was 22 DAP, and (2) digging and evaluating corn roots on May 12 as described in Test 1.

RESULTS/DISCUSSION: No differences were observed in plant stands (Table 1). Chinch bug numbers were significantly reduced compared to untreated corn by all insecticides except Force as measured 35 DAP. Root damage by Mexican corn rootworm as measured by the Iowa State 1-6 root-rating scale (old method), was significantly lower in all insecticide treated corn compared with untreated corn. Counter, Aztec, and Force treatments had lower damage ratings than either rate of Fortress. Similar data were obtained with the Iowa State 0-3 node-injury scale (new method). However, with this rating scale, one of the Fortress rates had damage ratings not different from Counter and Force. Yields were not obtained due to drought and Hurricane Claudette.

Aztec reduced root damage by Mexican corn rootworm as measured by both root damage scales (Table 2). There were no differences in root injury among the Aztec rates evaluated. This is the second year that similar results have been obtained with Aztec. It has not been possible to measure yields; therefore, we would not recommend reduced rates for Mexican corn rootworm. Note that the soil pH at this location is near neutral which might partly explain the lack of a root damage rate response.

ACKNOWLEDGMENTS: BASF, Bayer, Syngenta, and Amvac Companies are acknowledged for their support of this work. We appreciated the assistance and use of equipment from Hopkins Agricultural Services. Thanks are extended to the Hernandez family for providing land and equipment for many years in conducting field studies.

Table 1. Plant stand, chinch bug numbers, and damage to corn roots by Mexican corn rootworm in plots treated with various granular insecticides applied at-planting, Hernandez Farms, Goliad County, TX, 2003.

Treatment	Rate (oz/1000 row ft)	Plants (1000's/acre)	Chinch bugs per 20 plants[a]	Root damage rating Old[b]	Root damage rating New[c]
Counter 20CR	6.0	23.4 a	1.3 b	2.43 c	0.24 cd
Aztec 2.1G	6.7	23.2 a	0.0 b	2.67 c	0.12 d
Force 3G	5.0	24.7 a	4.0 ab	2.72 c	0.22 cd
Fortress 2.5G	6.0	24.3 a	0.7 b	3.51 b	0.78 bc
Fortress 2.5G	7.5	22.7 a	2.7 b	3.78 b	1.12 b
Untreated		24.7 a	8.7 a	4.75 a	1.90 a
LSD (P = 0.05)		NS	4.77	0.638	0.603
P > F		.3439	.0225	.0001	.0004

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

[a] Counts on Apr 15 (35 DAP)

[b] Old method - Iowa State 1 - 6 root-rating scale: 1 = no visible feeding damage up to 6 = 3 or more nodes of roots eaten to within 1.5 inches of the stalk.

[c] New method - Iowa State 0 - 3 node-injury scale: 0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes of roots eaten, and 3 = 3 or more nodes of roots eaten.

Table 2. Comparison of Aztec rates on corn for control of Mexican corn rootworm, Hernandez Farms, Goliad County, TX, 2003.

Treatment & formulation	Rate (oz/1000 ft)	Plants (1000's/acre)	Root damage rating	
			Old[a]	New[b]
Aztec 2.1G	6.70	17.8 a	2.62 b	0.16 b
Aztec 2.1G	5.02	17.2 a	2.36 b	0.14 b
Aztec 2.1G	3.25	18.2 a	2.77 b	0.22 b
Untreated		18.2 a	5.37 a	2.37 a
LSD (P = 0.05)		NS	0.570	0.320
P > F		.1416	.0001	.0001

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

[a] Old method - Iowa State 1 - 6 root-rating scale: 1 = no visible feeding damage up to 6 = 3 or more nodes of roots eaten to within 1.5 inches of the stalk.

[b] New method - Iowa State 0 - 3 node-injury scale: 0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes of roots eaten, and 3 = 3 or more nodes of roots eaten.

EFFECTIVENESS OF AZTEC ON CORN PLANTED ON LAND FOLLOWING SORGHUM OR CORN

Jim Pettus Farm, Goliad County, 2003

Roy D. Parker and Brian D. Yanta
Extension Entomologist and County Extension Agent, respectively
Corpus Christi and Goliad, Texas

SUMMARY: The test was established to compare the economics of a corn/corn rotation with a sorghum/corn rotation. Adverse weather and Hurricane Claudette destroyed the plot before yields could be obtained. Generally, increased insect damage from both chinch bug and Mexican corn rootworm occurred in the corn/corn rotation and it appeared that reduced insecticide rates would be economically feasible in the sorghum/corn rotation.

OBJECTIVE: The experiment was designed to (1) measure effects of Mexican corn rootworm or other pest insects on corn following corn, or corn following sorghum, (2) determine if lower rates of soil insecticide would be more cost effective on corn following sorghum, and (3) determine yields from the treatments. Hurricane Claudette and wild hogs destroyed the experiment before harvest.

MATERIALS/METHODS: Pioneer 32R25 hybrid corn was planted on Mar 10, 2003 with a John Deere MaxEmerge Plus vacuum planter on the Jim Pettus Farm on Newton Powell Road northwest of Goliad. Treatments were arranged in a randomized complete block design with 3 replications in 4-row wide by 300-ft plots with rows on 38-inch centers. Corn had been grown in the area where corn followed corn for more than 6 years. Sorghum was planted the previous season on rows with the corn/sorghum rotation. The clay loam soil (23% sand, 42% silt, and 35% clay) contained 1.7% organic matter and the pH was 8.0. Soil moisture at planting was good and the soil temperature at planting depth was 64°F. Aztec was banded over the open seed furrow. Fertilizer applied was 350 lb of 25-4-2 + .07 zinc.

Treatments were assessed by (1) counting the number of plants on 13.75 ft row on each of the center 2 rows in plots on Apr 9, (2) counting chinch bugs on 20 plants/plot 30 DAP, (3) assigning a plant damage rating [chinch bug and Mexican corn rootworm] on May 8 based on 1 = no damage up to 5 = severe stunting, uneven growth, and dead plants, (4) digging 6 plants from the center 2 rows in each plot on May 8 to rate for Mexican corn rootworm damage using the Iowa State root-rating scale [1 = no visible damage up to 6 = 3 or more nodes of roots eaten within 1.5 inches of the stalk] and the new 0 - 3 node-injury scale [0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes so eaten, and 3 = 3 or more nodes so eaten]. Corn was destroyed by Hurricane Claudette before harvest.

RESULTS/DISCUSSION: Plant stands were not different, but statistically significant treatment effects were found in chinch bug numbers and damage, and in Mexican corn rootworm damage to corn roots (Table 1). Significantly greater numbers of chinch bugs were observed in plots with the corn/corn rotation where Aztec was not applied (untreated) compared with all other experimental treatments. Additionally, the same result was observed in plant damage rating. Surprisingly few plants still remained in untreated corn/corn rotation plots by May 8. A portion of the increased chinch bug numbers on a per plant basis and subsequent damage can be attributed to concentration on fewer plants in the untreated corn/corn rotation. Mexican corn rootworm damage was low in all plots except the untreated corn/corn rotation. Generally roots exhibited the presence of feeding scars in insecticide treated corn and in the untreated corn/sorghum rotation. Almost 1 node of roots was destroyed in the untreated corn/corn rotation. We were not able to obtain the key data desired (yield) due to Hurricane Claudette.

ACKNOWLEDGMENTS: Thanks are extended to Bayer CropScience for supplying Aztec for conduct of this study. We also appreciate the assistance of Fred Pena in test establishment. Jim Pettus is acknowledged for providing the test location and his continued interest.

Table 1. Damage from chinch bug and Mexican corn rootworm on corn planted in rotation with sorghum or following corn and the impact of two rates of Aztec, Jim Pettus Farm, Goliad County, TX, 2003.

Previous crop	Insecticide (rate)	Plants (1000's/acre)	Chinch bugs/20 plants[a]	Plant damage rating[b]	Root damage rating	
					Old[c]	New[d]
Sorghum	Aztec 2.1G (6.7 oz/1000 ft)	18.3 a	14.3 bc	1.7 bc	1.56 c	.05 b
	Aztec 2.1G (3.35 oz/1000 ft)	19.3 a	15.7 b	1.3 c	1.72 bc	.05 b
	Untreated	16.7 a	10.7 bc	3.0 b	2.21 bc	.24 b
Corn	Aztec 2.1G (6.7 oz/1000 ft)	20.7 a	7.0 c	2.3 bc	1.96 bc	.07 b
	Aztec 2.1G (3.35 oz/1000 ft)	18.5 a	10.0 bc	2.7 bc	2.29 b	.10 b
	Untreated	17.3 a	30.0 a	5.0 a	3.67 a	.97 a
LSD (P = 0.05)		NS	8.56	1.369	0.706	0.378
P > F		.1165	.0018	.0019	.0007	.0017

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

[a] Counts were made on Apr 9 (30 DAP).

[b] Plant damage ratings range from 1 = no damage up to 5 = severe stunting, uneven plant growth and dead plants. Ratings were made on May 8 and damage was caused by a combination of chinch bug and Mexican corn rootworm.

[c] Old method - Iowa State 1 - 6 root-rating scale: 1 = no visible feeding damage up to 6 = 3 or more nodes of roots eaten to within 1.5 inches of the stalk.

[d] New method - Iowa State 0 - 3 node-injury scale: 0 = no feeding damage, 1 = 1 node of roots eaten within 2 inches of the stalk, 2 = 2 nodes of roots eaten, and 3 = 3 or more nodes of roots eaten.

ASSESSMENT OF INSECTICIDES FOR CHINCH BUG CONTROL ON CORN

Ralph Ramsey, Jr. Farm, Goliad County, 2003

Roy D. Parker and Brian D. Yanta
Extension Entomologist and County Extension Agent, respectively
Corpus Christi and Goliad, Texas

SUMMARY: Poncho and Counter were more effective in reducing chinch bugs compared with Aztec and Force. The Force treatments were originally designed to include Cruiser seed treatment, but it was learned later that the seed was not treated with Cruiser. We already knew from numerous other experiments that Force was not effective on chinch bug. Aztec provided some plant protection from chinch bug, but it was obvious that Poncho seed treatment provided superior protection against chinch bug damage compared with all other experimental treatments.

OBJECTIVE: The experiment was established to evaluate insecticide treatments for effectiveness in controlling chinch bugs. Note: the Force treatments should have included Cruiser treated seed, but following planting it was learned that no Cruiser was present on the seed.

MATERIALS/METHODS: N79-L3 hybrid corn was planted on Mar 24, 2003 in 4-row by 30 ft plots with 4 replications in a randomized complete block design with a 2-row John Deere 7100 planter equipped with research cone seed distributors. Row centers were 38 inches. The study was on the Ralph Ramsey, Jr. Farm near the intersection of Riverdale and Irby Roads northwest of Goliad. The field was left fallow in 2002. The heavy clay soil (23% sand, 28% silt, and 49% clay) contained 1.5% organic matter and had a pH of 7.9. Soil moisture at planting was excellent with little rainfall for most of the season until Hurricane Claudette. Soil temperature at the 4-inch depth on the planting date was 67°F. Granular Aztec, Counter and Force were placed in a T-band over the open seed furrow. Herbicide broadcast with a Spyder plot sprayer on the day of planting was Roundup (1 qt/acre) + Dual II Magnum (1.5 pt/acre) + Atrazine (1 qt/acre).

Treatments were assessed by (1) counting the number of plants on 10 row ft on each of the center two rows on Apr 16, (2) counting the number of chinch bugs in the center two rows around 20 plants per plot on Apr 16 [23 DAP] and Apr 26 [33 DAP], (3) assigning a damage rating where 1 = no damage up to 5 = severe stunting, uneven plant growth and poor plant color 33 and 44 DAP.

The original experiment had included 10 treatments, but it was learned that certain seed treatments had not been applied to seed. Two of these seed treatments were supposed to be included with the lower rates of Force. Drought and Hurricane Claudette prevented yield determination.

RESULTS/DISCUSSION: Chinch bug numbers were relatively high in the test which resulted in noticeable differences (Table 1). It was generally obvious that granular Counter and Poncho seed treatment provided better protection than other treatments. Although Aztec was not statistically lower in plant damage than Poncho or Counter, it was obvious that it did not provide a high degree of protection from chinch bug. Similarly, Poncho was numerically better than Counter. Force was not expected to provide chinch bug control without the planned seed treatment.

ACKNOWLEDGMENTS: Thanks are extended to Syngenta and Gustafson companies for monetary support and for providing product for conduct of the experiment. The assistance of Rudy Alaniz and Mike Hiller, Demonstration Assistants, is appreciated. Hopkins Agricultural Services are acknowledge for use of the 2-row cone planter. Special thanks are extended to Ralph Ramsey for providing land for this experiment.

Table 1. Impact of granular and seed treatment insecticides on chinch bug numbers and plant damage, Ralph Ramsey, Jr. Farm, Goliad County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	Chinch bugs per 20 plants[a] 23 DAP[a]	Chinch bugs per 20 plants[a] 33 DAP	Plant damage rating[b] 33 DAP	Plant damage rating[b] 44 DAP
Counter 20CR (6.0 oz/1000 ft)	14.8 a	20.5 a	22.5 c	1.8 cd	2.0 cd
Force 3G[c] (3.0 oz/1000 ft)	15.3 a	42.5 a	75.0 a	3.3 a	3.3 ab
Force 3G[c] (4.0 oz/1000 ft)	14.4 a	36.5 a	65.5 ab	2.5 abc	2.3 bc
Poncho 600FS (0.25 mg AI/seed)	13.9 a	24.5a	9.0 c	1.0 d	1.0 d
Aztec 2.1G (6.7 oz/1000 ft)	14.3 a	35.5 a	29.5 c	2.3 bc	2.0 cd
Untreated	15.1 a	47.0 a	33.5 bc	2.8 ab	3.8 a
LSD (P = 0.05)	NS	NS	32.39	0.88	1.06
P > F	.9744	.0934	.0038	.0012	.0009

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

[a] DAP - days after planting.

[b] Plant damage ratings range from 1 = no damage up to 5 = severe stunting, uneven plant growth, and poor plant color.

[c] Force treatments should have included Cruiser treated seed, but due to a mistake it was not on the seed.

EVALUATION OF AT-PLANTING SYSTEMIC INSECTICIDES FOR CONTROL OF YELLOW SUGARCANE APHID

Joseph Respondek Farm, DeWitt County, 2003

Roy D. Parker, Anthony J. Netardus, and Lawrence L. Falconer
Extension Entomologist, County Extension Agent,
and Extension Economist, respectively
Corpus Christi, Cuero, and Corpus Christi, Texas

SUMMARY: Gaucho, Cruiser, and Counter provided significant yield increases in sorghum production through control of yellow sugarcane aphid (YSA). In this case, yield increases ranged from 1184 to 1812 lb/acre which returned $42.17 to $69.48 above insecticide and harvest costs. Furthermore, little advantage was obtained by overspraying these treatments with Dimethoate. Apparently, most of the economic damage occurred when sorghum plants were less than 8 inches tall. Generally, we recommend use of an at-plant systemic insecticide on sorghum in Coastal Bend counties. Long-term yield increases from treatment with those products have averaged 300-400 lb/acre.

OBJECTIVE: This field study was conducted to compare systemic at-planting insecticides for effectiveness on insect pests and to evaluate effects of these products on sorghum production.

MATERIALS/METHODS: Pioneer 8313 hybrid sorghum was planted at 70,000 kernels/acre on Mar 16, 2003 on the Joseph Respondek Farm located on County Road 111 just across the DeWitt County line in Karnes County. The planter was an 8-row John Deere 7100 MaxEmerge, plots were 4-rows (38-inch centers) by 900 ft, and the experiment was planted in a randomized complete block design with 3 replications. Conditions at the site during planting included 68°F soil temperature at 4-inch depth, excellent soil moisture, soil pH 6.0, organic matter content of 2.36%, and a sandy clay loam texture (58% sand, 18% silt, and 24% clay). Granular Counter was applied in a T-band. Corn had been grown at the site the previous season. Guardsman Max herbicide was applied in a 19-inch band at 1.0 qt/acre. The fertilizer applied in this test was 84N-28P-12K+2S.

All but 70 ft of row in each plot was oversprayed with foliar Dimethoate 4E (1.5 pt/acre) for yellow sugarcane aphid on Apr 9, 19, and 28. Seventy feet of the experiment was not treated so that effects of non-foliar treated sorghum could be evaluated.

Treatments were assessed by (1) counting the number of plants in 13.75 row ft on each of the center 2 rows in plots on Apr 8; (2) counting the number of yellow sugarcane aphids on 20 plants/plot on Apr 8 [23 days after planting = DAP], Apr 15 [30 DAP], Apr 22 [37 DAP], and Apr 28 [43 DAP]; (3) assigning a plant damage rating where 1 = no damage up to 5 = stunted plants, uneven stand and dead plants; (4) hand harvest 13.75 ft row at two locations each in Dimethoate treated and untreated sorghum on Jul 22; and (5) harvest of entire plots that were treated with Dimethoate with a commercial machine on Jul 24. Plot weights were converted to a standard 14% moisture level.

RESULTS/DISCUSSION: Data will be presented separately for sorghum which was not oversprayed and that was oversprayed with Dimethoate.

No Dimethoate Applied: Yellow sugarcane (YSA) exceeded the economic treatment threshold and caused plant damage with significant differences observed in treatments (Table 1). Refer to pages 11-12 in Texas Cooperative Extension Publication, B-1220, "Managing Insect and Mite Pests of Texas Sorghum" dated Jun 1998 for YSA discussion. First, YSA were heavy in all treatments 23 and 30 days after planting (DAP), i.e. exceeded the economic damage threshold for that size sorghum (Table 1). Even so, Gaucho and Cruiser treatments contained significantly fewer YSA than Counter treated or untreated sorghum, and Counter treated plots had fewer YSA than the untreated sorghum 23 DAP. By 30 DAP, significantly more YSA were present in the untreated sorghum.

Differences were not found 37 and 43 DAP. In these plots (no Dimethoate applied) season average YSA numbers were significantly fewer in Gaucho and Cruiser treated sorghum and Counter treated sorghum had fewer than the untreated sorghum. These results were generally reflected by plant damage ratings (Table 3 for no overspray). Yields were significantly greater in Gaucho, Cruiser and Counter treated sorghum compared with untreated sorghum as measured by hand harvest.

Dimethoate Overspray Applied: The foliar treatments reduced the number of YSA in all treatments 30 DAP (Table 2 compared with Table 1); by 37 DAP differences in treatments were not present nor were YSA numbers different in Dimethoate treated and untreated sorghum. Note that by 43 DAP in the Dimethoate treated plots, significantly more YSA were present where Gaucho or Cruiser was used and the Counter treatment had numerically more than the untreated sorghum. This reversal in numbers may have resulted because plants in the at-plant insecticide plots were larger and more attractive for YSA colonization or possibly fewer predators were present in these plots. The season average YSA numbers reflected what was found where no Dimethoate was applied (Table 1 & 2).

Apparently most of the damage by YSA occurred before Dimethoate was applied (Table 3). Evidence of this can be seen in Table 3 where plant height measurements made 37 DAP (Apr 22) were significantly greater in Cruiser and Gaucho treatments compared with Counter and untreated sorghum. Dimethoate treatment had little effect on plant height. The hand harvest yield reflected little difference whether Dimethoate was applied except in the untreated sorghum. In that case (untreated sorghum) a 661 lb/acre yield advantage was observed in Dimethoate treated compared with no Dimethoate treatment (no statistical analysis was made).

Commercial Combine Harvest: Information on overall plant stands (early count before plant death caused by YSA), combine harvest data, and economics of at-planting systemic insecticide use is presented in Table 4. Bushel weights were lower in untreated sorghum, and grain moisture (except for Counter treatment) was greater in untreated sorghum. Yields in the Gaucho, Cruiser and Counter treatments were statistically greater compared with untreated sorghum. Dollar returns/acre due to these at-plant treatments ranged from

$42.17 for Counter up to $69.48 for Gaucho. We believe use of an at-plant systemic insecticide is economically justifiable for most of the Coastal Bend region.

ACKNOWLEDGMENTS: The support of Joseph Respondek in providing land, labor, and his interest in conduct of the field study are appreciated. Syngenta and Gustafson Companies are thanked for their support and BASF is acknowledged for providing Counter. Boening Brothers Inc., Floresville, are given special thanks for treating this small experiment by air for rice stink bug. Their quick response saved the experiment. Victor Eder, Garst Seed Company, is thanked for his assistance and in providing harvest equipment. We also acknowledge the Sorghum PROFIT Initiative by the Texas Legislature for partial support of this work.

Table 1. **No Dimethoate Overspray applied:** Number of yellow sugarcane aphids on sorghum treated with systemic insecticides at-planting, Joseph Respondek Farm, DeWitt County, TX, 2003.

Treatment (rate)	Number/20 plants on days after planting				
	23	30	37	43	Season avg
Gaucho 480FS (8.0 oz/cwt seed)	91.7 c	158.7 b	48.0 a	37.0 a	83.8 c
Cruiser 5FS (5.1 oz/cwt seed)	40.0 c	193.7 b	47.0 a	25.3 a	76.5 c
Counter 20CR (3.0 oz/1000 ft)	273.3 b	297.7 b	23.3 a	4.7 a	149.8 b
Untreated	363.3 a	1191.7 a	42.3 a	9.3 a	401.7 a
LSD (P = 0.05)	76.48	207.8	33.06	24.06	63.75
P > F	.0001	.0001	.3198	.0541	.0001

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

Table 2. **Dimethoate Overspray applied:** Number of yellow sugarcane aphids on sorghum treated with systemic insecticides at-planting, Joseph Respondek Farm, DeWitt County, TX, 2003.[a]

Treatment (rate)	Number/20 plants on days after planting				
	23	30	37	43	Season avg
Gaucho 480FS (8.0 oz/cwt seed)	91.7 c	37.0 a	33.7 a	41.3 a	50.9 c
Cruiser 5FS (5.1 oz/cwt seed)	40.0 c	32.7 a	50.3 a	42.7 a	41.4 c
Counter 20CR (3.0 oz/1000 ft)	273.3 b	46.7 a	36.3 a	23.0 ab	94.8 b
Untreated	363.3 a	67.0 a	47.0 a	7.3 b	121.2 a
LSD (P = 0.05)	76.48	33.58	25.71	22.17	17.76
P > F	.0001	.1585	.3923	.0230	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Dimethoate 4E (1.5 pt/acre) was applied to all plots 24, 34, and 43 days after planting.

Table 3. Comparison of at-plant systemic insecticides for effect on sorghum plant height, damage, and yield with and without foliar Dimethoate, Joseph Respondek Farm, DeWitt County, TX, 2003.

	Plant height (inches)[a]		Plant damage on DAP[b] overspray		Plant damage on DAP[b] no overspray		Yield (lb/acre)[d]	
Treatment (rate)	overspray	no overspray	30	37	30	37	overspray[c]	no overspray
Gaucho 480FS (8.0 oz/cwt seed)	13.0 a	13.6 a	1.7 c	1.8 c	2.3 b	2.7 c	3925 a	4132 a
Cruiser 5FS (5.1 oz/cwt seed)	13.6 a	12.8 a	2.3 c	2.0 c	2.7 b	2.7 c	4054 a	3842 a
Counter 20CR (3.0 oz/1000 ft)	8.2 b	8.0 b	4.0 b	3.3 b	4.5 a	4.0 b	4076 a	4439 a
Untreated	6.6 b	5.2 c	5.0 a	4.3 a	5.0 a	5.0 a	3493 b	2832 b
LSD (P = 0.05)	4.38	1.60	.745	.763	1.342	.726	400.6	823.1
P > F	.0184	.0001	.0001	.0006	.0065	.0006	.0373	.0137

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

[a] Plant height measurements were made Apr 22 (37 DAP) on 5 plants/plot.

[b] DAP= days after planting. Plant damage ratings range from 1 = no damage up to 5 = stunted plants, uneven stand, and dead plants.

[c] Dimethoate 4E (1.5 pt/acre) was applied 24, 34, and 43 DAP.

[d] Represents yields obtained by harvest of 13.75 row ft at 2 locations in each treatment (i.e. two locations each in overspray and non-overspray plots).

Table 4. **Combine harvest:** Production of sorghum treated at-planting with systemic insecticide, Joseph Respondek Farm, DeWitt County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	Bushel weight	% grain moisture	Yield lb/acre[a]	$ increase over untreated[b]
Gaucho 480FS (8.0 oz/cwt seed)	60.7 a	58 a	14 b	3677 a	69.48
Cruiser 5FS (5.1 oz/cwt seed)	62.7 a	58 a	14 b	3362 ab	56.96
Counter 20CR (3.0 oz/1000 ft)	59.8 a	58 a	15 ab	3049 b	42.17
Untreated	64.2 a	55 b	17 a	1865 c	
LSD (P = 0.05)	NS	2.0	1.7	509.8	
P > F	.9353	.0207	.0212	.0006	

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

[a] Machine harvested yield. The entire experiment was treated with Dimethoate 4E (1.5 pt/acre), 24, 34, and 43 DAP.

[b] Sorghum value based on 4.80/cwt. Costs/acre include Gaucho ($5.72), Cruiser ($5.17), and Counter ($6.71). Granular Counter application cost used was $0.25/acre. Harvesting/hauling extra yield above the untreated was calculated at $0.65/cwt.

EVALUATION OF GAUCHO, CRUISER AND SORGHUM GUARD APPLIED AT-PLANTING ON SORGHUM

Clarence Chopelas Farm, San Patricio County, 2003

Roy D. Parker, Jeffrey R. Stapper, and Lawrence L. Falconer
Extension Entomologist, County Extension Agent,
and Extension Economist, respectively
Corpus Christi, Sinton, and Corpus Christi, Texas

SUMMARY: Yellow sugarcane aphid (YSA) numbers were reduced and yields were improved by using Gaucho and Cruiser seed treatments. As expected Sorghum Guard (mixture of Captan and lindane) did not provide protection from YSA. A relatively low YSA infestation level was present, but increased yields in the Gaucho and Cruiser treatments provided $8.35 and $7.87 returns, respectively, over costs associated with use of these treatments.

OBJECTIVE: At-planting insecticides were evaluated for effect on insect pests and subsequent impact of yield.

MATERIALS/METHODS: Pioneer 85G85 hybrid sorghum was planted Apr 2, 2003 on the Clarence Chopelas Farm 0.75 miles south of Hwy 188 on County Road 21 (old number). A John Deere MaxEmerge Plus Vacumeter 1720 planter was set to seed 68,000 kernels/acre on rows with 38-inch centers. The experiment was planted in a randomized complete block design with 3 replications in 6 row plots. Fertilizer was 104-24-0 + 2 lb sulfur. Atrazine (1.0 lb/acre) was applied for weed control. Soil temperature at planting was 68°F and moisture conditions were excellent. A soil sample was not obtained to determine characteristics, but it was a heavy clay with approximately 8.2 pH. Sorghum Guard was mixed with the seed for that treatment on the planting date.

Treatments were assessed by (1) counting plants on 13.75 ft row in each of the center 2 rows in plots on Apr 16 [14 DAP], (2) determining percentage yellow sugarcane aphid infested plants on Apr 16 [3 true leaves], Apr 23 [5 true leaves] and May 2 [8 true leaves], (3) estimating corn leaf aphid numbers/whorl by examining 10 plants/plot on May 9 [37 DAP], and by harvesting 700 ft row in each plot (two plots were 580 ft long) with a commercial combine on Jul 11. Grain weights were adjusted for moisture to a standard 14%.

RESULTS/DISCUSSION: YSA infested plants were significantly reduced in the Gaucho and Cruiser treatments compared to the Sorghum Guard treatment and the untreated sorghum on each inspection date (Table 1). Although statistical differences were not measured in CLA numbers in plant whorls, the Gaucho and Cruiser treated sorghum had much lower numbers. Grain yields were also significantly increased in the Gaucho and Cruiser treated sorghum; dollar returns were $8.35/acre and $7.87/acre for these treatments respectively.

ACKNOWLEDGMENTS: Thanks are extended to Clarence Chopelas for his time, equipment and land in conducting this experiment. The Janysek Brothers from Karnes County are acknowledged for their assistance in harvesting the plots. We acknowledge Vernon Nedbalek, Sorghum Partners, for his presence throughout harvest and use of his weighing equipment. Gustafson and Syngenta Companies are thanked for their assistance. We also acknowledge the Sorghum PROFIT Initiative by the Texas Legislature for partial support of this work.

Table 1. Plant stand, yellow sugarcane aphid infested plants, corn leaf aphid numbers, yield, and dollar return in sorghum treated at-planting with various insecticides, Clarence Chopelas Farm, San Patricio County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	% YSA infested plants on DAP[a]			CLA/ whorl[b]	Yield (lb/acre)	$ return over untreated[c]
		14	21	30			
Gaucho 480FS (8.0 oz/cwt seed)	64.5 a	0.0 b	1.8 b	2.9 b	15.0 a	4431 a	8.35
Cruiser 5FS (5.62 oz/cwt seed)	58.7 a	0.6 b	3.1 b	2.5 b	0.0 a	4419 a	7.87
Sorghum Guard (5.34 oz/cwt seed)	64.5 a	15.8 a	50.5 a	22.3 a	90.0 a	4024 b	- 3.23
Untreated	64.5 a	19.3 a	50.9 a	21.0 a	128.3 a	4092 b	
LSD (P = 0.05)	NS	6.48	21.5	8.71	NS	199.6	
P > F	.3599	.0006	.0016	.0018	.0688	.0043	

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

[a] YSA = yellow sugarcane aphid; DAP = days after planting which were Apr 16, 23, and May 2, respectively.

[b] CLA = corn leaf aphids counted on May 9 (37 DAP).

[c] Sorghum value based on $4.80/cwt. Costs/acre include Gaucho ($5.72), Cruiser ($5.17), and Sorghum Guard ($0.36/acre). Application cost for Sorghum Guard was calculated at $0.05/acre. Harvesting/hauling costs for the extra yield above the untreated sorghum was calculated at $0.65/cwt.

EVALUATION OF AT-PLANTING INSECTICIDES ON SORGHUM: THREE EXPERIMENTS

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: The only insect pests present in the three experiments in sufficient numbers to measure effects were yellow sugarcane aphid (YSA), and corn leaf aphid. Numbers of these aphids and subsequent damage was limited and considered of marginal significance. Gaucho, Cruiser, Poncho, experimental mixtures of seed treatments, and granular Counter proved to be effective in reducing YSA. Statistical differences in yields were not found in any of the three experiments. There appeared to be a trend towards increased yields due to certain systemic insecticides in two of the three experiments.

OBJECTIVE: The three experiments were conducted to (1) compare effects of seed, granular and planter seed box applied insecticides on soil insects and foliar feeding aphids (yellow sugarcane aphid, corn leaf aphid and greenbug), and (2) to measure effects of the treatments on grain yield.

MATERIALS/METHODS: Sorghum hybrids planted in three separate experiments at the Meaney Annex of the Texas Agricultural Experiment Station at Corpus Christi included Pioneer 8313 (test 1) planted on Mar 11, and Pioneer 8313 (test 2) and DK 54 (test 3), both planted on Mar 19. Sorghum seed was planted at 80,000 seed/acre with a 4-row blackland type planter equipped with plot cone planters set on 38-inch row centers. Plots were 4 rows wide by 40 ft long. Treatments in individual tests were arranged in randomized complete block designs with 4 replications. Granular Counter 20CR (3.0 oz/1000 ft row) was applied through electric driven Gandy boxes. Cotton had been planted on the site the previous season. The soil was a clay loam (43% sand, 21% silt, and 36% clay) at 7.8 pH and contained 1.1% organic matter. Each experiment was treated either on the day or day after planting with Atrazine (1 qt/acre) + Dual II Magnum (1.0 pt/acre). Fertilizer applied on Jan 6 was 104-0-0. Hand harvested sorghum was threshed on a research machine and grain weights were adjusted for moisture to 14% standard.

Test 1 - Treatments were assessed by (1) counting the number of plants on 13.75 ft row on each of the 2 center rows in plots on Apr 6 = 26 days after planting [DAP], (2) calculating percentage of plants infested with yellow sugarcane aphids on Apr 6 [26 DAP], Apr 14 [34 DAP], and Apr 26 [46 DAP], (3) estimating the number of corn leaf aphids in whorls by examining 10 plants/plot on Apr 26 [46 DAP], and (4) harvesting 13.75 ft row in each plot for yield on Jul 1.

Test 2 - Sorghum seed (Pioneer 8313) in this experiment was from the same seed bags used on the Respondek Farm in DeWitt County. Treatments were assessed by (1) counting the number of plants on 13.75 ft row in each of the two center rows in plots on Apr

7 [18 DAP], (2) calculating the percentage sorghum plants infested with yellow sugarcane aphids on Apr 7 [18 DAP], Apr 15 [26 DAP], and Apr 27 [38 DAP], (3) estimating corn leaf aphid numbers on Apr 27 [38 DAP] by looking at 10 plants/plot, and (4) harvesting 13.75 ft row from each of the 2 center rows in plots on Jul 10.

Test 3 - Planting date, field counts and harvest data collection were the same as Test 2.

RESULTS/DISCUSSION: Results of experiments are discussed separately.

Test 1 - Statistically significant differences were observed in yellow sugarcane aphid (YSA) numbers 26 and 34 DAP (Table 1). Sorghum plants are extremely vulnerable to damage at this growth stage, but in this experiment numbers were relatively low. By 46 DAP, YSA percentage infested plants had increased (very few per plant), but statistical differences between treatments were not measured. Corn leaf aphid numbers were significantly lower in the Gaucho and Cruiser treatments, but in the Counter and Sorghum Guard treatments, CLA numbers were not different from that observed in untreated sorghum (46 DAP). Although yields were not significantly improved, the numerical yield increase in the Gaucho and Cruiser treatments appeared to reflect reduced YSA numbers.

Test 2 - YSA numbers were low in the experiment, and only on one inspection date (26 DAP) were significantly more plants infested in untreated sorghum than were found in the Gaucho, Cruiser or Counter treatments (Table 2). Significant differences were not found in plant population or yield data.

Test 3 - Plant stands were not different, but 26 DAP the percentage of YSA infested plants was significantly greater in the Kernel Guard, L 1283-A1, and untreated plots compared with all other treatments (Table 3). However, overall numbers were low in all plots. Corn leaf aphid numbers were also significantly greater in Kernel Guard and untreated sorghum 38 DAP compared with all other treatments except Counter and L1283 + A1. Significant differences were not found in the yield data although there seemed to be an increased yield trend in many of the insecticide plots.

Overall, YSA infestations were not heavy enough or did not persist long enough to cause significant damage. The systemic seed treatments were effective in reducing aphid numbers, and yield trends appeared to reflect YSA infestation reduction.

ACKNOWLEDGMENTS: Syngenta and Gustafson Companies are thanked for their assistance in conduct of these studies. We also acknowledge the Sorghum PROFIT Initiative by the Texas Legislature for partial support of this work. Rudy Alaniz and Mike Hiller, Demonstration Assistants, are thanked for their help in all aspects of conducting these field experiments.

Table 1. Effect of at-planting systemic insecticides on yellow sugarcane aphid, corn leaf aphid and yield of sorghum, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	% YSA infested plants on DAP[a]				CLA/ whorl[b]	Yield (lb/acre)
		26	34	46	Season Avg		
Gaucho 480FS (8.0 oz/cwt seed)	79.6 a	2.5 b	10.5 b	28.8 a	13.9 c	3.8 b	3030 a
Cruiser 5FS (5.1 oz/cwt seed)	94.6 a	0.0 b	9.0 b	17.5 a	8.8 c	1.3 b	2967 a
Counter 20CR (3.0 oz/1000 ft)	87.3 a	0.0 b	14.0 b	31.5 a	15.2 bc	66.5 a	2761 a
Sorghum Guard (5.34 oz/cwt seed)	80.5 a	12.5 a	38.0 a	16.3 a	22.3 ab	52.5 ab	2838 a
Untreated	89.4 a	17.5 a	35.5 a	26.3 a	26.4 a	62.5 a	2760 a
LSD (P = 0.05)	NS	7.83	14.18	NS	8.18	53.70	NS
P > F	.3322	.0009	.0011	.1691	.0039	.0440	.7003

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

[a] YSA = yellow sugarcane aphid; DAP = days after planting

[b] CLA = corn leaf aphid 46 DAP (Apr 26).

Table 2. Comparison of at-planting systemic insecticides on sorghum for effects on yellow sugarcane aphid and corn leaf aphid, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	% YSA infested plants on DAP[a] 18	26	38	CLA/ whorl[b]	Yield (lb/acre)
Gaucho 480FS (8.0 oz/cwt seed)	81.9 a	0.0 a	3.8 b	21.3 a	0.0 a	3909 a
Cruiser 5FS (5.1 oz/cwt seed)	100.1 a	0.0 a	3.8 b	12.5 a	0.0 a	3563 a
Counter 20CR (3.0 oz/1000 ft)	78.8 a	0.0 a	21.3 b	20.0 a	2.0 a	4286 a
Untreated	81.5 a	5.0 a	53.8 a	25.0 a	7.5 a	3955 a
LSD (P = 0.05)	NS	NS	17.63	NS	NS	NS
P > F	.0954	.0877	.0004	.6470	.1500	.1029

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

[a] YSA = yellow sugarcane aphid; DAP = days after planting

[b] CLA = corn leaf aphid 38 DAP (Apr 27).

Table 3. Evaluation of insecticides on sorghum for effects on yellow sugarcane aphid, corn leaf aphid, and yield, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	% YSA infested plants on DAP[a] 18	26	38	CLA/ whorl[b]	Yield (lb/acre)
Gaucho 480FS (8.0 oz/cwt seed)	107.8 a	0.0 b	3.8 c	29.8 a	0.0 c	3377 a
Poncho 600FS (5.62 oz/cwt seed)	89.4 a	0.0 b	2.5 c	5.8 a	0.0 c	3613 a
L1045 + L0263 (3.2 + 2.56 oz/cwt seed)	80.8 a	0.0 b	0.0 c	19.5 a	0.0 c	3856 a
L1045 + L0263 (4.0 + 3.2 oz/cwt seed)	92.8 a	0.0 b	0.0 c	14.8 a	0.0 c	3636 a
Cruiser 5FS (5.62 oz/cwt seed)	84.5 a	0.0 b	3.8 c	11.3 a	0.0 c	3636 a
Counter 20CR (3.0 oz/1000 ft)	88.0 a	0.0 b	6.3 c	23.0 a	19.0 bc	3213 a
Kernel Guard Supreme (5.0 oz/cwt seed)	68.0 a	8.8 a	41.3 a	39.0 a	42.0 a	3426 a
L1283 + A1 (5.0 oz/cwt seed)	88.8 a	0.0 b	25.0 b	17.8 a	14.3 bc	3567 a
Untreated	89.3 a	0.0 b	27.5 b	13.5 a	21.8 ab	3395 a
LSD (P = 0.05)	NS	1.216	6.643	NS	21.01	NS
P > F	.4753	.0001	.0001	.7652	.0028	.0713

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

[a] YSA = yellow sugarcane aphid; DAP = days after planting

[b] CLA = corn leaf aphid 38 DAP (Apr 27).

COMPARISON OF MIDGE DAMAGE ON RESISTANT AND SUSCEPTIBLE SORGHUM HYBRIDS AND IMPACT ON YIELD WITH AND WITHOUT INSECTICIDE TREATMENT

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker, Larry L. Falconer, and Stephen D. Livingston
Extension Entomologist, Extension Economist, and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: An experiment to evaluate five sorghum hybrids for response to sorghum midge attack was conducted with and without insecticide protection. Sorghum midge numbers at 50% bloom were substantially lower than in past midge studies. Sorghum midge damage was reduced by insecticide in all hybrids, but the reduction was not statistically significant for the two midge resistant hybrids where damage did not exceed an average of 7.8% even without insecticide for these hybrids. The susceptible hybrid sustained 77.3% midge damage where insecticide was not applied. Yields were not statistically different in four of the hybrids where insecticide was used, but for one resistant hybrid (ATx640*Tx2882), the yield was significantly lower than ATx2752*RTx430 (susceptible) and Garst 5616 (low resistant level). With the level of protection provided with insecticide, economic return was greater for the susceptible hybrids with higher yield potential. Without insecticide almost the reverse in yield levels occurred. The two midge resistant hybrids produced significantly greater yield, followed by the two Garst hybrids, which in turn produced significantly more grain compared with susceptible ATx2752*RTx430.

OBJECTIVE: The experiment was conducted to compare sorghum hybrids with and without Baythroid insecticide treatments for (1) midge damage (2) production level, and (3) dollar return/acre.

MATERIALS/METHODS: Sorghum hybrids were planted Apr 16, 2003 on the Meaney Annex at the Texas Agricultural Experiment Station, Corpus Christi, in 4-row by 40-ft plots with 4 replications arranged in a randomized complete block design. A blackland type planted with attached research cone seed distributors were used to place approximately 5 seed/ft in rows which were on 38-inch centers. The late planting date was to assure sorghum midge infestation. Cotton had been planted on the site in the previous season. Atrazine (1.0 qt/acre) was applied for weed control. Iron sulphate (5 lb/acre) was applied on May 7 in 15 gpa total spray volume. Fertilizer applied was 104-0-0.

Baythroid 2E (0.9oz/acre) was applied to early blooming susceptible hybrid (ATx2752*RTx430) on Jun 11, 13, 16, 18, and 20 and to the remaining hybrids on Jun 18, 20, 23, and 26. The insecticide was broadcast over the center 2 rows in each plot with a Spyder self propelled plot sprayer traveling at 2.5 mph, with two 4X hollow cone nozzles/row delivering 9.7 gpa at 40 psi. The entire experiment was oversprayed for leaffooted bugs with Dimethoate 4E (1.0 pint/acre) on Jul 7 and 14.

The experiment was analyzed as a factorial. Treatments were assessed by (1) counting the number of sorghum midge/head by observing 5 blooming heads/plot in the center 2 rows of plots on 6/11, 14, 17, 20, 22 and 26 [only midge numbers present at approximately 50% bloom will be reported] , (2) estimating % bloom level in each plot on Jun 11, 20, 22, and 23, (3) estimating % midge damage in plots by visual observation on Jul 7, and (4) harvesting 13.75 ft row in 1 of the 2 center rows in each plot on Jul 29. Grain moisture levels were measured with a Dole 400 moisture tester and plot weights were adjusted to 14% moisture.

RESULTS/DISCUSSION: Blooming data for the 5 hybrids are presented in Table 1. No influence of insecticide on bloom rate was found; therefore, ANOVA was used to separate means. An attempt had been made to select hybrids which would bloom about the same time, but ATx2752*RTx430 (susceptible hybrid) was much earlier in blooming. The blooming period of other hybrids was generally later.

Statistically significant effects on midge damage were noted for insecticide treatment, hybrid, and insecticide x hybrid interaction (Table 2). First, there were no differences in midge damage among the hybrids in insecticide treated plots. Second, response of hybrids to midge damage in treated compared to untreated plots varied according to hybrid type. In the two midge resistant hybrids (ATx640*Tx2882 and A8PR1013*Tx2882) there was not a statistical difference in % midge damage in insecticide treated or untreated plots. However, there was a strong trend in both hybrids for less damage in the insecticide treated sorghum (2.3% to 8.8% and 1.3% to 6.8% in treated compared with untreated, respectively for the two hybrids). In all other hybrids statistically less midge damage occurred in insecticide treated sorghum. Garst 5515 and 5616 had similar midge damage levels in untreated plots which was statistically higher than the resistant hybrids but lower than the susceptible ATx2752*RTx430 hybrid.

Statistically significant effects on sorghum yields were noted for insecticide treatment, hybrid, and hybrid x insecticide interaction (Table 2). First, within each hybrid the insecticide treated sorghum produced significantly greater yield compared with untreated. Second, for the susceptible hybrid, both Garst hybrids, and the resistant hybrid (A8PR1013*Tx2882), production was not significantly different under insecticide protection. However, yield for the susceptible and Garst 5616 hybrids were statistically greater than the midge resistant hybrid ATx640*Tx2882 produced under insecticide protection. Third, in untreated sorghum yield levels were reversed; that is, the two resistant hybrids produced significantly greater yield compared with the others, and Garst hybrids produced significantly more than the susceptible hybrid in this case.

Several midge counts were made, but only the number present at 50% bloom are shown (Table 3). This season marked the first experiment in which sorghum midge numbers were generally greater early in the bloom period and in which late planted sorghum generally produced a higher yield in the Coastal Bend than early planted sorghum. Late planted sorghum was able to utilize rainfall for growth and seed development. Dollar return for each hybrid treated or untreated based on the numerical yield is given in Table 3. Note that there was a substantially greater economic return (except for the resistant ATx640*Tx2882 hybrid) for the insecticide treated sorghum (individual hybrid comparisons). Note especially the drastic reduction in yield when no insecticide was used on the susceptible hybrid; most of our commercial hybrids would be expected to perform in this fashion. The susceptible hybrid produced more yield than the resistant hybrids when treated with insecticide, and even with added expense had a greater economic return. However, in past years sorghum midge numbers have been greater and water more limited in late planted sorghum. Results under more normal conditions may be different. For this reason we plan to continue the experiment in future years.

ACKNOWLEDGMENTS: The Sorghum PROFIT initiative project funded by the Texas Legislature and promoted by the Texas Grain Sorghum Producers Association are acknowledged for their assistance. Dr. Gary Peterson and Dr. Bill Rooney, Sorghum Breeders with the Texas Agricultural Experiment Station are thanked for providing seed and their interest in the project. Rudy Alaniz and Mike Hiller, Demonstration Assistants and Jeremy Salinas, Student Worker, are thanked for their help with the field study. Appreciation is expressed to Bayer CropScience for providing support.

Table 1. Bloom rates of sorghum hybrids evaluated with and without insecticide for sorghum midge control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Hybrid	Midge insecticide applied[a]	% bloom by dates			
		6/11	6/20	6/22	6/26
ATx640*Tx2882	Yes[b]	0 b	31 b	42 bc	88 bc
	No	0 b	28 bc	44 b	86 bc
A8PR1013*Tx2882	Yes[b]	0 b	20 cd	31 cd	92 ab
	No	1 b	17 de	30 cd	94 ab
Garst 5515	Yes[b]	0 b	9 ef	31 cd	78 cd
	No	0 b	7 f	21 d	74 d
Garst 5616	Yes[b]	0 b	14 def	35 bc	79 cd
	No	1 b	15 def	31 cd	80 cd
ATx2752*RTx430	Yes[c]	5 a	84 a	90 a	100 a
	No	5 a	85 a	90 a	99 a
LSD (P = 0.05)		2.2	8.6	12.9	9.8
P > F		.0001	.0001	.0001	.0001

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

[a] Baythroid 2EC (0.9 oz/acre)

[b] Baythroid was applied on Jun 18, 20, 23, and 26.

[c] Baythroid was applied on Jun 11, 13, 16, 18, and 20.

Table 2. Comparison of sorghum hybrids for midge damage and yield with and without insecticide protection for sorghum midge, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Hybrid	% midge damage		Yield (lb/acre)	
	treated[a]	untreated	treated[a]	untreated
ATx640*Tx2882[b]	2.3 a e	8.8 c e	4275 b e	3848 a f
A8PR1013*Tx2882[b]	1.3 a e	6.8 c e	4470 ab e	3518 a f
Garst 5515[b]	0.7 a e	23.3 a f	4648 ab e	2256 b f
Garst 5616[b]	2.3 a e	22.5 b f	4510 a e	2290 b f
ATx2752*RTx430[c]	5.2 a e	77.3 a f	4776 a e	1207 c f

Means followed by a, b, c are compared vertically. Means followed by e, f for midge damage and separately for yield are compared horizontally. Those sharing a common letter are not significantly different at P = 0.05.

[a] Baythroid 2EC (0.9 oz/acre)

[b] Baythroid was applied on Jun 18, 20, 23, and 26.

[c] Baythroid was applied on Jun 11, 13, 16, 18, and 20.

Table 3. Evaluation of sorghum hybrids with and without insecticide for sorghum midge control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Hybrid	Midge insecticide applied[a]	Midge/head at 50% bloom[d]	Yield (lb/acre)	$ return/ acre[e]
ATx640*Tx2882	Yes[b]	0.3	4275	165.58
	No	2.0	3848	169.31
A8PR1013*Tx2882	Yes[b]	0.4	4470	174.16
	No	2.1	3518	154.79
Garst 5515	Yes[b]	0.0	4648	181.99
	No	4.0	2256	99.26
Garst 5616	Yes[b]	0.9	4510	175.92
	No	4.5	2290	100.76
ATx2752*RTx430	Yes[c]	4.3	4776	181.99
	No	6.3	1207	5.31

[a] Baythroid 2EC (0.9 oz/acre)

[b] Baythroid was applied on Jun 18, 20, 23, and 26.

[c] Baythroid was applied on Jun 11, 13, 16, 18, and 20.

[d] 50% bloom on ATx2752*RTx430 was on Jun 16. Remaining hybrids reached 50% bloom on Jun 23. Data was not analyzed.

[e] Sorghum value was based on $5.00/cwt. Costs include Baythroid 2E (0.9 oz/acre), application cost was $3.25/acre (4 treatments on Garst and resistant hybrids; 5 treatments on the susceptible hybrid), and harvest/hauling ($0.60/cwt).

EFFECT OF DIMETHOATE ON SORGHUM PLANTS

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: The dimethoate labels for sorghum state: "do not apply after heading" even though it is labeled for sorghum midge which must be applied after heading. We found no one who knew why this statement existed on labels but speculated that the reason might be adverse effects on developing heads. In our study we found that Dimethoate applied to sorghum in the early milk stage at rates up to 1 quart/acre had no visible effect on plant color, growth, head development, or yield.

OBJECTIVES: Application of dimethoate was made to sorghum to determine if any adverse effects of the chemical could be found.

MATERIALS/METHODS: Pioneer 84G62 hybrid sorghum was planted on Mar 19, 2003 at the Meaney Annex of the Texas Agricultural Experiment Station at Corpus Christi. Atrazine + Dual II Magnum was applied after planting for weed control. Fertilizer applied was 104-0-0. Iron sulfate (5 lb/acre) was broadcast across all plots on May 8. Plots selected for dimethoate application were 4 rows wide by 40 ft long and treatments were replicated 4 times in a randomized complete block design. Dimethoate 4E (0.5, 1.0, and 2.0 pints/acre) was applied on May 29 with a Melroe Spray Coupe sprayer in a total volume of 15 gpa, through two, 12X hollowcone nozzles/row at 40 psi while traveling at 4 mph.

Treatments were assessed by (1) assigning a damage rating to plots on Jun 3, 8, and Jul 10 [1= no plant effects observed up to 5= evidence of yellowing, leaf necrosis, twisting, height growth effects, or general unhealthy appearance], (2) hand harvest of 13.75 ft row in each of the center rows in plots on Jul 10. Harvested heads were processed on a research plot thresher, and grain weight was adjusted to a 14% moisture standard.

RESULTS/DISCUSSION: Dimethoate was not found to have significant effects on sorghum growth and development, or on grain yield (Table 1). There may have been a slight numerical trend for increased damage ratings as the chemical rate increased on two of the inspection dates (6/1 and 6/8) which were 3 and 10 days after treatment. There was also some slight numerical evidence of adverse yield effect; however, this issue will have to be studied further.

ACKNOWLEDGMENTS: Appreciation is expressed to Rudy Alaniz and Mike Hiller, Demonstration Assistants, and Jeremy Salinas, Intern, for their help. The Sorghum PROFIT project is thanked for providing funding to conduct this and other field projects.

Table 1. Evaluation of dimethoate for effect on sorghum plants, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment	Rate (pints/acre)	Plant damage rating[a]			% grain moisture	Yield (lb/acre)
		6/1	6/8	7/7		
Dimethoate 4E	0.5	1.3 a	1.5 a	3.3 a	15.1 a	4661 a
Dimethoate 4E	1.0	1.7 a	1.3 a	3.6 a	15.4 a	4242 a
Dimethoate 4E	2.0	1.8 a	1.8 a	3.3 a	15.2 a	4404 a
Untreated		1.3 a	1.3 a	3.0 a	15.6 a	4717 a
LSD (P = 0.05)		NS	NS	NS	NS	NS
P > F		.7439	.8331	.6754	.1753	.1163

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

[a] Damage ratings: 1= no plant effects observed up to 5= evidence of yellowing, leaf necrosis, twisting, height growth effects, or general unhealthy appearance.

PRELIMINARY REPORT ON THE EVALUATION OF STORED SORGHUM PROTECTANTS FOR INSECT PESTS

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Darwin J. Anderson
Extension Entomologist and General Manager, Bee County Cooperative, respectively
Corpus Christi and Tynan, Texas

SUMMARY: Grain temperatures were generally higher in treatments with the greatest number of insects. Insect numbers did not exceed one/quart sample in the Actellic + Diacon II treatment and were relatively low until the 12th storage month in the Actellic, Spintor + Reldan, and Storcide treatments. None of these 4 treatments exceeded 5 insects/quart sample during the first 11 months of the storage period, but in month 12 two replications of the Actellic treatment contained lesser grain borers (8.0/quart sample). Furthermore, none of these 4 treatments or the Spintor treatment on cleaned grain reached one primary pest insect/quart sample (rice weevil, lesser grain borer or angoumois grain moth) during the first 11 months, but in month 12 (in addition to the Actellic) the Storcide treatment had two primary pest insects (angoumois grain moths) per quart sample. Results to date have been extremely promising for several protectants.

In this preliminary report only the total number of insects (all pest species) will be reported. To date 9 insect pest species (see footnote on Table 2) and 2 species of beneficial parasites have been detected. A more extensive analysis of species composition will be provided in a future report.

OBJECTIVE: The experiment was initiated to compare the effectiveness of selected grain protectants on stored sorghum against important insect species under conditions of the Texas Gulf Coast (Coastal Bend Region). Grain temperature and moisture, and insect numbers were measured on a monthly basis.

MATERIALS/METHODS: Sorghum that had been in storage for approximately 3 months was obtained from the Planters Grain Coop, Odem, Texas. Grain was commercially cleaned for one treatment. Sorghum measured in 50 lb increments was treated on Oct 2, 2002 in mixtures applying equivalent to 5 gallons of liquid/1000 bushels in a stainless steel modified cement mixer with added baffels for seed mixing. Four 50 lb samples of each treatment were placed in 50 gallon plastic drums (200 lb total sorghum/drum). Drums were left open except for 0.5-inch hardware cloth to keep out birds, rodents and other unwanted animals. Following treatment and loading of drums, Phostoxin pellet (1/30 gal drum) was placed into the center of the grain mass, followed by sealing with 6 ml polyethylene sheeting and tape. Drums were sealed for 5 days and then aerated for 5 days. Sampling of 3 drums per replication revealed no live insects. The natural infestation was supplemented in late Oct 2002 by placing 10 adults in each drum of 4 species (rice weevil, red flour beetle, lesser grain borer and rusty grain beetle). These insects were obtained from Oklahoma State University.

Each treatment was replicated 4 times and drums, arranged in a randomized complete design, were placed on a concrete floor inside a building. Insects from grain inside and outside the building had access to the experimental grain.

Treatments were assessed each month by (1) measuring the temperature with a 12-inch thermometer placed 11.5 inches deep into the middle of each drum, (2) probing grain in each drum at 6 locations/drum with a grain probe to obtain a one quart sample for insect inspection and moisture content, and (3) using a Seedburo Equipment Company sieve (8/64 - inch triangle holes) to separate insects from the grain. Insects separated by species separated by species were then counted under a Circline magnifier lamp.

RESULTS/DISCUSSION: Grain temperatures declined for the first 4 months. Readings were generally below 60°F from Dec 2002 through Feb 2003 (Table 1). In Mar grain temperature averaged above 70°F, but significant differences did not occur in treatment readings until May (7th month of storage). Grain temperature in May was significantly elevated in untreated grain compared with all insecticide treatments except for the DES treatment. Generally, grain temperatures were elevated in treatments containing a high number of insects over the next five month period (Jun - Oct).

Significantly greater numbers of insects (total of all species) were detected in untreated grain compared with treated grain beginning at the end of one month storage and continued for 4 months (Table 2). In the 4th storage month, insect numbers in treatments DEB and DES were statistically greater than in other insecticide treated grain, but numbers were still significantly lower than in the untreated grain. Generally the better treatments during the first 11months of storage were both Actellic treatments, Spintor + Reldan, and Storcide. Through 11 months of storage, 4 treatments did not exceed 5 insects/quart sample (Actellic, Actellic + Diacon II, Spintor + Reldan, and Storcide). Five insects/quart sample were exceeded first in the untreated grain (month 5), DEB and DES (month 6), both treatments of Spintor (month 9), and Actellic along with the Storcide treatment (month 12).

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Table 1. Temperature levels in stored sorghum treated with grain protectants, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment (rate)	Temperature at months post-treatment[c]												
	1	2	3	4	5	6	7	8	9	10	11	12	Avg
Actellic 5E (11.5 oz/1000 bu))	71.1 a	60.5 a	59.0 a	56.0 a	70.8 a	76.3 a	82.0 c	86.4 d	84.8 bc	88.3 cd	83.5 b	82.0 b	75.1b
Actellic 5E + Diacon II (11.5 + 6.6 oz/1000 bu)	71.2 a	60.8 a	59.5 a	55.8 a	70.0 a	76.0 a	82.0 c	86.3 d	84.8 bc	88.0 d	83.0 b	81.8 b	74.9b
Spintor 2SC (1.9 oz/1000 bu)	71.1 a	61.3 a	58.5 a	55.8 a	70.5 a	76.3 a	82.0 c	86.5 d	84.3 c	89.0 abc	83.3 b	82.0 b	75.1b
Spintor 2SC[a] (1.9 oz/1000 bu)	70.7 a	60.8 a	59.5 a	55.8 a	70.8 a	76.5 a	82.0 c	86.5 d	84.3 c	88.5 bcd	83.5 b	82.0 b	75.1b
Spintor 2SC + Reldan 4E (1.9 + 5.4 oz/1000 bu)	71.4 a	61.0 a	59.0 a	56.0 a	70.3 a	76.0 a	82.0 c	86.6 cd	85.3 ab	88.3 cd	83.3 b	81.3 b	75.0b
Storcide (11.2 oz/1000 bu)	71.4 a	61.0 a	58.5 a	56.0 a	70.5 a	76.0 a	82.0 c	86.9 bcd	85.3 ab	89.3 ab	84.5 a	85.3 a	75.5a
DEB[b] (1.7 grams/50 lb)	71.4 a	60.8 a	58.5 a	55.5 a	70.8 a	76.5 a	82.4 b	88.0 a	85.8 a	89.5 a	84.8 a	85.0 a	75.8a
DES[b] (2.83 grams/50 lb)	71.4 a	61.0 a	59.5 a	56.0 a	70.5 a	76.8 a	82.5 ab	87.5 ab	85.5 ab	89.3 ab	84.8 a	84.3 a	75.8a
Untreated	71.1 a	60.8 a	59.5 a	55.5 a	70.5 a	76.8 a	82.8 a	87.3 bc	85.5 ab	89.5 a	85.0 a	85.3 a	75.8a
LSD (P = 0.05)	0.93	0.83	1.6	0.65	0.87	0.72	0.37	0.73	0.92	0.93	0.81	1.20	0.36
P > F	0.8672	0.7685	0.6715	0.5605	0.6799	0.1997	0.0008	0.0004	0.0166	0.0093	0.0001	0.0001	0.0001

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

[a] Grain was commercially cleaned for this treatment.

[b] Experimental formulations

[c] Month “1" was November 2002.

Table 2. Insect numbers in stored sorghum treated with grain protectants, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment (rate)	Total insect pests/quart sample at months post-treatment[c, d]												
	1	2	3	4	5	6	7	8	9	10	11	12	Avg
Actellic 5E (11.5 oz/1000 bu))	0.0 b	0.0 b	0 b	0 c	0.0 c	0 c	0.3 c	0.3 c	0.3 d	0 d	0.5 b	8.0 d	.77 d
Actellic 5E + Diacon II (11.5 + 6.6 oz/1000 bu)	0.0 b	0.0 b	0 b	0 c	0.0 c	0 c	0 c	0 c	0.3 d	0.3 d	0 b	0.0 d	.04 d
Spintor 2SC (1.9 oz/1000 bu)	0.0 b	0.0 b	0 b	0 c	0.0 c	1.5 c	2 bc	3.5 c	11.5 cd	13 cd	10.8 b	12.0 cd	4.52 d
Spintor 2SC[a] (1.9 oz/1000 bu)	0.3 b	0.8 b	0 b	0 c	0.3 bc	0.5 c	1 c	2.8 c	6.5 d	4.3 d	10.8 b	12.3 cd	3.27 d
Spintor 2SC + Reldan 4E (1.9 + 5.4 oz/1000 bu)	0.0 b	0.0 b	0 b	0 c	0.0 c	0 c	0 c	0.3 c	1.8 d	0.5 d	1.5 b	0.8 d	0.40 d
Storcide (11.2 oz/1000 bu)	0.3 b	0.0 b	0 b	0 c	0.0 c	0 c	0 c	1 c	2.0 d	1.8 d	0.8 b	6.0 d	0.98 d
DEB[b] (1.7 grams/50 lb)	0.3 b	0.0 b	1 b	2.5 b	2.0 bc	10 bc	5.5 bc	16.5 b	23.5 bc	22 bc	35.5 a	27.3 ab	12.16 c
DES[b] (2.83 grams/50 lb)	0.3 b	0.3 b	1 b	3 b	3.0 ab	22.5 ab	17 b	24.8 ab	43.0 a	38.3 a	35.5 a	25.8 bc	17.85 b
Untreated	1.8 a	2.8 a	6 a	5.8 a	5.8 a	38.8 a	40.3 a	28.3 a	30.8 ab	35.5 ab	37.3 a	41.0 a	22.81 a
LSD (P = 0.05)	0.666	1.27	1.674	1.774	2.958	16.693	15.0	10.16	13.88	15.504	14.982	14.285	4.520
P > F	.0003	.0023	.0001	.0001	.0040	.0004	.0001	.0001	.0001	.0001	.0001	.0001	.0001

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

[a] Grain was commercially cleaned for this treatment.

[b] Experimental formulations

[c] Insect pests detected included rusty grain beetle, red flour beetle, rice weevil, lesser grain borer, hairy fungus beetle, sawtoothed grain beetle, corn sap beetle, Indian meal moth, and angoumois grain moth.

[d] Month "1" was November 2002.

COMPARISON OF CRUISER, GAUCHO, AND TEMIK ON COTTON

Jon Prince Farm, Nueces County, 2003

Roy D. Parker, Harvey L. Buehring, and Michael W. Potter
Extension Entomologist, County Extension Agent, and Demonstration Assistant, respectively
Corpus Christi and Robstown, Texas

SUMMARY: Cruiser and Gaucho seed treatments and granular Temik were evaluated for their effect on early season arthropod pests. Very low numbers of thrips, mites, and aphids were encountered. Thrips numbers were 10-fold below the economic treatment threshold at the 1-2 and 3 true leaf stages of cotton plant growth. No differences were observed in plant stands, thrips, mite, or aphid numbers. Not only was there no yield response, but neither was there a numerical trend for increased yield as has so often been the case in such experiments in Coastal Bend cotton. The long-term yield response to these treatments has been just over 50 lb lint/acre.

OBJECTIVES: The field experiment was conducted to determine whether at-planting insecticide use could be justified and to compare at-planting Cruiser, Gaucho, and Temik for effectiveness on early season insects (thrips).

MATERIALS/METHODS: FiberMax 832 variety cotton was planted on the Jon Prince Farm on County Road 6 a few hundred yards west of County Road 53 in the Chapman Ranch area in Nueces County on Apr 10, 2003. A 16-row Kinse model 3600 air planter delivered 60 thousand seed/acre in 708 ft plots that were on 30-inch centers. Individual plots were 4 rows on the ends of the planter; this arrangement was used to avoid differences in rows caused by wheel packing and other factors associated with planter box location on the tool bar. Treatments were arranged in a randomized complete block design with 3 replications. Soil texture was clay (18% sand, 38% silt, and 44% clay) containing 1.89% organic matter with a pH of 8.2. Soil moisture at planting was adequate and soil temperature was 70° F. Sorghum had been planted in the field the previous growing season. The herbicide Prowl (1.8 qt/acre) was applied before planting. Fertilizer applied was 225 lb/acre of 24-8-0+2S+2% zinc.

Treatments were assessed by (1) counting the number of plants on 10-row ft in each of the center rows in plots on Apr 26, (2) cutting 10 plants from the center 2 rows in each plot on Apr 26 [1-2 true leaves] and again on May 3 [3 true leaves] and placing these specimens in 70% ETOH for evaluation of thrips numbers at a later date, (3) washing the plant samples and vacuuming the liquid through filter paper followed by examination under a microscope for arthropods, and (4) harvesting entire plots with a mechanical stripper on Aug 19. Seed cotton weights were determined, and a sample was obtained to determine lint percentage. The lint samples were processed on a 10-saw Eagle laboratory gin.

RESULTS/DISCUSSION: Data for plant stands, early season arthropods, and lint production are given in Table 1. Statistical differences were not found in plant stands, but on a numerical basis, Cruiser and Gaucho plots averaged nearly 10 thousand plants/acre less than the number in the Temik and untreated plots. Not only were statistical differences not found in thrips, mites, and aphids 16 or 23 days after planting, their numbers were lower than ever we have encountered in experiments of this nature conducted in Texas Coastal Bend counties. Thrips numbers were 10 fold or more below economically damaging numbers, and for the first time, fewer thrips were found on the second inspection date (23 DAP) when plants had reached the 3-leaf stage. Mites and aphid numbers were also extremely low.

The consequence of non-existent pest arthropods was that there were no differences in cotton production. Lint yield across all treatments including the untreated cotton averaged 1221 lb lint/acre. Yields of this magnitude are generally not obtained in the Coastal Bend with a planting date of Apr 10. Plants were able to take advantage of late season rainfall following a dry first half of the season.

In long-term evaluation of at-plant systemic insecticide use, economic returns have been positive. In the Lower Coastal Bend the yield increase has averaged just over 50 lint lb/acre. On the Upper Gulf Coast long-term yield increases have been substantially greater (at least 75 lb/acre).

ACKNOWLEDGMENTS: Thanks are extended to the Jon Prince Family for their interest and assistance in conducting this field study. The assistance of Prince Farm employees Gilbert Villanueva, Blade Ramirez, and Pedro Requena is appreciated. Bruce and Hayden Franklin are acknowledged for harvesting the experimental plots.

Table 1. Comparison of systemic insecticides applied to seed or placed in-furrow as granules for effect on early season arthropods and impact on lint production, Jon Prince Farm, Nueces County, TX, 2003.

Treatment (rate)	Plants (1000's/acre)	Number/10 plants on indicated days after planting[a] [b]						Yield (lb lint/ acre)[c]
		Thrips		Mites		Aphids		
		16	23	16	23	16	23	
Cruiser 5FS (7.6 oz/cwt seed)	35.7 a	0.3	0.8	0.0	0.0	0.0	0.0	1204
Gaucho 600FS (6.4 oz/cwt seed)	38.0 a	1.0	0.0	0.3	0.3	0.8	0.3	1168
Temik 15G (4.0 oz/1000 ft)	45.0 a	1.3	0.0	0.0	0.3	0.0	1.0	1267
Untreated	45.3 a	0.8	0.3	0.3	1.3	1.0	0.0	1246
LSD (P = 0.05)	NS	NS	NS	NS	NS	NS	NS	NS
P > F	.2932	.4517	.1889	.4547	.8587	.1753	.2867	.2253

[a] No statistically significant differences were found in any of the data by ANOVA.

[b] Plant growth stage 16 days after planting (DAP) = 1 - 2 leaf (Apr 26); 23 DAP = 3 leaf (May 3).

[c] Statistical analysis was conducted on transformed data ($\sqrt{x+1}$); untransformed means are presented here.

EFFECT OF INSECTICIDES ON THRIPS AND FLEAHOPPER NUMBERS

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: Thrips, mite, and aphid numbers were extremely low in early season counts before any foliar insecticide had been applied. Centric was applied to 5th leaf stage cotton on Apr 28 to remove thrips for better comparison with Temik. Later, Orthene, Bidrin, and Centric were applied at the 1/3 grown square stage on May 15 for fleahopper control. Temik plots were not treated; therefore, we could make observations on level of fleahopper control, if any, achieved with Temik. Three days after foliar treatments for fleahoppers (May 18) all insecticide plots including the Temik treatment contained fewer fleahoppers than untreated cotton. By 12 DAT these differences, except for Bidrin, were still observed. Season average fleahopper numbers were significantly lower in the Centric treatment than in all other treatments. Although not shown statistically, lint yield in the Centric treatment was 95 lb/acre more than untreated cotton and Temik treated cotton was 40 lb/acre above untreated cotton. The Orthene, Bidrin, and Temik treatments were not different. We gathered preliminary data suggesting that Temik had some level of impact on fleahopper numbers (at least under moderate infestation levels). Additional evaluations with Temik and the newer systemic seed treatments are planned for the future.

OBJECTIVES: The primary objective was to determine if Temik had an affect on fleahopper numbers.

MATERIALS/METHODS: ST4892BR variety cotton was planted on Mar 31, 2003 at the Texas Agricultural Experiment Station Meaney Annex near Corpus Christi. A blackland type planter equipped with cone seeders and Gandy electric driven boxes for the granular Temik was used to plant the 8-row by 40 ft plots. Treatments were arranged in a randomized complete block design with 4 replications. Sorghum had been planted on the site the previous season. Rows were spaced on 38 inch centers and 4 seeds/row ft were planted. Soil temperature at planting was 70°F. with excellent moisture. The sandy clay loam soil (50% sand, 17% silt, and 33% clay) had a pH of 7.9 and contained 1.0% organic matter. Fertilizer applied was 104-0-0 and herbicide consisted of Treflan followed at planting by Dual II Magnum.

Evaluated treatments were as follows: (1) Temik 15G was placed into the seed furrow at planting. (2) Centric 40WG at 3.0 oz/acre + Silwet at 8.0 oz/100 gallons of spray mixture was applied to one set of plots [Centric treatment] for thrips on Apr 28 with a Lee Company Spyder Trac self-propelled sprayer equipped with a CO_2 pressurized unit. A total spray volume of 7.2 gpa was applied through 4X hollow cone nozzles (2/row) at 40 psi traveling at 3.1mph. (3) Orthene 75SP [4.75 oz/acre], Bidrin 8E [2.4 oz/acre], and Centric 40 WG [2.0 oz/acre] were applied for fleahopper control in appropriate plots on May 15. The same equipment as described for the earlier Centric treatment was used, but 9.5 gpa total volume was applied through 8X hollow cone nozzles (2/row) at 40 psi traveling at 4.5 mph. The only other insecticide (Bidrin 8E at 8.0 oz/acre) was applied for stink bug control on Jul 2, and it was applied again the next day due to immediate rainfall after the first treatment. Equipment used for this application was a Melroe Spray-Coupe traveling at 4.5 mph delivering 12 gpa through 4X hollow cone nozzles (2/row), at 40 psi.

Treatments were assessed by (1) cutting 10 plants from the center 4 rows in each plot on Apr 17 and Apr 26 at the 2-3 and 5 true leaf stages, respectively, and placing them in 70% ETOH for later examination for thrips; (2) counting the number of fleahopper nymphs and adults on 20 plant terminals in the middle 4 rows of plots on May 5 [7 leaf], May 11 [matchhead square], May 18 [1/3 grown square], and May 27 [bloom]; (3) counting lady beetles, big-eyed bugs, and pirate bugs on 20 plant terminals in the center 4 rows of plots on May 11, 18, and 27; and (4) harvesting rows 3 and 6 in each plot on Aug 12 with a 1-row spindle picker. Seed cotton samples were weighed, and a sample was obtained and processed on a 10-saw Eagle laboratory gin to determine percentage lint.

RESULTS/DISCUSSION: Thrips, mite, and aphid numbers were low in early season counts made at the 2nd and 5th true leaf stages of plant development (Table 1). Even by the 5th true leaf stage of plant development, the highest number recorded in one of the "planned" treatments was 8.8 on 10 plants (0.88/plant). On that date (Apr 26) the only treatment that had been applied as Temik. Three days after foliar treatments were applied for fleahoppers (May 18) all insecticide treated plots including the Temik treatment contained significantly fewer nymphs and total fleahoppers than untreated cotton (Tables 2, 3, and 4). At the same time there were no differences in number of adults. Since fleahopper numbers had been only numerically lower in Temik treated cotton in pretreatment counts, it is somewhat difficult to understand why the Temik treatment, along with the foliar treatments, did not differ statistically but were all lower than numbers in untreated cotton. By 12 DAT these differences, except for Bidrin, were still evident for nymphs and total fleahoppers. Season average fleahopper numbers were significantly lower in the Centric treatment than all other treatments, and the Orthene, Bidrin, and Temik treatments were not different but were all lower in number than the untreated cotton. Data that suggests fleahopper control from Temik this long after application should be considered preliminary pending additional testing.

Predator insect counts consisting of lady beetles, big-eyed bugs, and pirate bugs were made on 3 dates (Table 5). Their numbers were low on the evaluation dates. Prey in the form of aphids and other host insects were found in low numbers; statistical differences were not observed.

Differences were not observed in lint production (Table 6). Numerically, all insecticide treated cotton had greater yield than untreated, but the increase ranged from 1.0 lb/acre (Orthene plots) to 95 lb/acre in Centric treated cotton. Although it could not be measured statistically, the increased yield in the Centric treated cotton may reflect low fleahopper numbers observed.

ACKNOWLEDGMENTS: Valent, Syngenta, and DuPont companies are thanked for their support. Appreciation is expressed to Rudy Alaniz and Mike Hiler, Demonstration Assistants and Jeremy Salinas, Intern, for their help with field operations.

Table 1. Thrips, mite, and aphid numbers present in early cotton development stages before any insecticide had been applied except the Temik treatment, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Number/10 plants					
		2-leaf stage (4/17)			5-leaf stage (4/26)		
Treatment	Rate	thrips	mites	aphids	thrips	mites	aphids
Orthene 75SP	4.75 oz/acre	0.3 a	0.5 ab	16.5 a	7.3 a	0.8 a	8.8 b
Bidrin 8E	2.4 oz/acre	0.5 a	1.0 a	3.8 b	8.8 a	1.3 a	6.3 b
Temik 15G	4.0 oz/1000 ft	0.5 a	0.0 b	4.8 b	6.5 ab	0.5 a	5.8 b
Centric 40WG	2.0 oz/acre	0.0 a	0.0 b	16.5 a	3.5 b	0.3 a	9.0 b
Untreated		0.0 a	0.0 b	15.8 a	8.8 a	0.8 a	16.8 a
LSD (P = 0.05)		NA	.74	10.72	3.51	NA	6.72
P > F		.3036	.0434	.0381	.0374	.5665	.0257

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

Table 2. Fleahopper nymphs in cotton following various insecticide treatments and timing, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Fleaphopper nymphs/100 plant terminals				
Treatment	Rate	Pretrt. 1[a]	Pretrt 2[a]	3 DAT[c]	12 DAT[d]	Season avg
Orthene 75SP	4.75 oz/acre	3.8 a	8.8 a	1.3 b	15.0 bc	7.2 b
Bidrin 8E	2.4 oz/acre	6.3 a	8.8 a	1.3 b	27.5 ab	10.9 b
Temik 15G	4.0 oz/1000 ft	6.3 a	11.3 a	2.5 b	11.3 c	7.8 b
Centric 40WG	2.0 oz/acre	0.0 a[b]	0.0 a	0.0 b	2.5 c	0.6 c
Untreated		6.3 a	10.0 a	30.0 a	36.3 a	20.6 a
LSD (P = 0.05)		NS	NS	7.61	15.17	4.48
P > F		.2970	.2488	.0001	.0030	.0001

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

[a] Pretrt. 1 and 2 are May 5 (7 true leaves) and 11 (matchhead square), respectively.

[b] These plots were first treated on Apr 28 for thrips for evaluation against the Temik treated cotton.

[c] Refers to foliar treatment; 3 DAT = 3 days after treatment (May 18) with Orthene, Bidrin and Centric. Cotton was at the 1/3 grown square.

[d] Cotton was blooming on May 27 (12 DAT).

Table 3. Fleahopper adults in cotton following various insecticide treatments and timing, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Fleahopper adults/100 plant terminals				
Treatment	Rate	Pretrt. 1[a]	Pretrt 2[a]	3 DAT[c]	12 DAT[d]	Season avg
Orthene 75SP	4.75 oz/acre	8.8 a	7.5 a	1.3 a	6.3 a	5.9 a
Bidrin 8E	2.4 oz/acre	3.8 a	8.8 a	2.5 a	11.3 a	6.6 a
Temik 15G	4.0 oz/1000 ft	2.5 a	3.8 a	7.5 a	7.5 a	5.4 ab
Centric 40WG	2.0 oz/acre	0.0 a[b]	2.5 a	1.3 a	0.0 a	0.9 b
Untreated		7.5 a	8.8 a	8.8 a	12.5 a	9.4 a
LSD (P = 0.05)		NS	NS	NS	NS	4.59
P > F		.1399	.1379	.2005	.1593	.0235

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

[a] Pretrt. 1 and 2 are May 5 (7 true leaves) and 11 (matchhead square), respectively.

[b] These plots were first treated on Apr 28 for thrips for evaluation against the Temik treated cotton.

[c] Refers to foliar treatment; 3 DAT = 3 days after treatment (May 18) with Orthene, Bidrin and Centric. Cotton was at the 1/3 grown square.

[d] Cotton was blooming on May 27 (12 DAT).

Table 4. Fleahoppers (nymphs & adults) in cotton following various insecticide treatments and timing, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Fleaphopper (nymphs & adults)/100 plant terminals				
Treatment	Rate	Pretrt. 1[a]	Pretrt 2[a]	3 DAT[c]	12 DAT[d]	Season avg
Orthene 75SP	4.75 oz/acre	12.5 a	16.3 a	2.5 b	21.3 bc	13.1 b
Bidrin 8E	2.4 oz/acre	10.0 a	17.5 a	3.8 b	38.8 ab	17.5 b
Temik 15G	4.0 oz/1000 ft	8.8 a	15.0 a	10.0 b	18.8 bc	13.1 b
Centric 40WG	2.0 oz/acre	0.0 b[b]	2.5 a	1.3 b	2.5 c	1.6 c
Untreated		13.8 a	18.8 a	38.8 a	48.8 a	30.0 a
LSD (P = 0.05)		8.7	NS	10.41	22.28	5.88
P > F		.0357	.0735	.0001	.0059	.0001

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

[a] Pretrt. 1 and 2 are May 5 (7 true leaves) and 11 (matchhead square), respectively.

[b] These plots were first treated on Apr 28 for thrips for evaluation against the Temik treated cotton.

[c] Refers to foliar treatment; 3 DAT = 3 days after treatment (May 18) with Orthene, Bidrin and Centric. Cotton was at the 1/3 grown square.

[d] Cotton was blooming on May 27 (12 DAT).

Table 5. Total predators (lady beetles, big-eyed bugs, and pirate bugs) in cotton following various insecticide treatments and timing, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Predators/20 plant terminals		
Treatment	Rate	5/11	5/18	5/27
Orthene 75SP	4.75 oz/acre	0.5 a	0.0 a	0.8 a
Bidrin 8E	2.4 oz/acre	0.5 a	0.8 a	1.0 a
Temik 15G	4.0 oz/1000 ft	0.8 a	0.3 a	1.3 a
Centric 40WG[a]	2.0 oz/acre	0.3 a	0.8 a	0.0 a
Untreated		0.5 a	1.0 a	1.3 a
LSD (P = 0.05)		NS	NS	NS
P > F		.4960	.6114	.3994

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

[a] These plots were first treated on Apr 28 for thrips for evaluation against the Temik treated cotton.

Table 6. Lint yield in cotton following various insecticide treatments and timing, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Treatment	Rate	Yield (lb lint/acre)
Orthene 75SP	4.75 oz/acre	1464 a
Bidrin 8E	2.4 oz/acre	1478 a
Temik 15G	4.0 oz/1000 ft	1503 a
Centric 40WG[a]	2.0 oz/acre	1558 a
Untreated		1463 a
LSD (P = 0.05)		NS
P > F		.1901

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

[a] These plots were first treated on Apr 28 for thrips for evaluation against the Temik treated cotton.

COTTON FLEAHOPPER: MEASUREMENT OF CROP DAMAGE AND EVALUATION OF NEW INSECTICIDES FOR CONTROL

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: No statistical differences or trends were observed in predator numbers. One set of plots was designated for automatic insecticide applications to begin at 6 true leaves (May 7), followed by a second automatic application at pinhead square (May 13). All plots, including the automatic treatment, were sprayed during 1/3 grown square (May 20) based on fleahopper counts indicating that they were near an economically damaging level. The P value we normally use to separate treatments statistically is .05 and the value 3 DAT was .0533. We chose to show statistical separation; therefore, the untreated cotton contained significantly greater numbers of fleahoppers on that date. By 6 DAT (May 20) all insecticide treated plots had fewer fleahoppers than untreated cotton, and by 14 DAT only Trimax and low rate of Intruder plots were not different from untreated cotton. All insecticide treated cotton had significantly fewer numbers of fleahoppers for the post treatment counts (average of 3, 6, and 14 DAT). The yield (lb lint/acre) increase due to treatment was surprising, and all insecticide treatments produced much higher yield than untreated cotton (average of 203 lb/acre).

OBJECTIVES: The field experiment was established to evaluate the impact of insecticides on cotton fleahopper, measure the effect of automatic applications of insecticide at a certain plant growth stages, and determine lint yields.

MATERIALS/METHODS: DP555BR cotton was planted April 10, 2003 on the Texas Agricultural Experiment Station Meaney Farm at Corpus Christi with a 4-row blackland planter equipped with research cone seed distributors. The late planting date was used in an attempt to assure more fleahoppers. Plots were 4-rows by 40 ft on 38-inch centers. Treatments were arranged in a randomized complete block design with 4 replications. Fertilizer applied was 104-0-0 and herbicide consisted of Treflan (1 lb/acre) applied in December and Dual (1.33 pt/acre) + Cotoran (3.0 pt/acre).

Insecticide treatments were made with a Spyder Trac self propelled sprayer to the 4-row plots through 8X hollow cone nozzles (2/row) at 40 psi in a total volume of 9.5 gpa at 4 mph. The automatic Centric treatment dates were May 7, 15, and 20. All other plots were treated on May 20. The entire test was treated on July 3 with Bidrin 8E (8.0 oz/acre) for the stink bug, *Euschistus quadrator*. The experimental plot was also treated 2 times with PIX plant growth regulator with a total of 14 oz/acre.

Treatments were assessed by (1) counting the number of fleahoppers on 20 plant terminals per plot on May 7 [6 true leaves], May 13 [pinhead square], May 20 [1/3rd grown square], May 23 [3 DAT], May 26 [6 DAT], and June 3 [14 DAT]; (2) counting on

20 plant terminals/plot lady beetles, pirate bugs, and big eyed bugs on May 26 and June 3; and (3) harvesting the 3rd row in each plot with a 1-row spindle picker. Seed cotton samples were processed on a 10-saw Eagle laboratory gin to obtain the percentage lint and calculate lint yield.

RESULTS/DISCUSSION: Fleahopper numbers did not reach treatment threshold until cotton was between 1/3 grown square stage and first bloom (May 20); although, 2 treatments had already been applied to the "automatic" treatment by that date (Tables 1 & 2). After the May 20 treatment (3 DAT), significantly more fleahoppers were present in untreated cotton (p value was .0533). Insecticide treated cotton contained statistically fewer fleahoppers 6 DAT. By 14 DAT all insecticide plots except for Trimax and low rates of Intruder still contained statistically fewer fleahoppers compared to untreated cotton.

Yield improvement due to insecticide use was surprisingly high (Table 2). The average yield increase amounted to 203 lb/acre and ranged form 121 to 257 lb/acre. It was evident that these insecticides were effective in reducing fleahoppers and protecting cotton fruit. Further, it is evident that treatment for fleahopper is not necessary until their numbers are at or near established threshold levels. Due to the large increase in yield through fleahopper control, timely treatment is strongly advised when numbers warrant.

ACKNOWLEDGMENTS: Valent, Syngenta, and DuPont companies are thanked for their support. Appreciation is expressed to Rudy Alaniz and Mike Hiller, Demonstration Assistants, Jeremy Salinas, Intern, and Clint Livingston, Technician I, for their help with field operations.

Table 1. Number of predators and fleahoppers (nymphs & adults) in cotton before economic numbers of fleahoppers were detected, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Number/20 plant terminals							
		Lady beetles		Pirate bugs		Big eyed bug		% fleahoppers	
Treatment	Rate (oz/acre)	5/26	6/3	5/26	6/3	5/26	6/3	5/7 6 leaf	5/13 pinhead
Orthene 75SP	4.8	0.3 a	0.3 a	0.0 a	0.0 a	0.0 a	0.0 a	2.5 a	3.8 a
Bidrin 8E	2.4	0.3 a	0.3 a	0.0 a	0.0 a	0.0 a	0.5 a	1.3 a	2.5 a
Trimax 4F	1.0	0.0 a	0.0 a	0.0 a	0.3 a	0.0 a	0.5 a	2.5 a	5.0 a
F1785 50DF	2.8	0.0 a	0.3 a	0.0 a	0.0 a	0.0 a	0.3 a	3.8 a	2.5 a
Centric 40WG	2.0	0.0 a	0.0 a	0.0 a	0.0 a	0.3 a	0.0 a	0.0 a	3.8 a
Intruder 70WP	0.4	0.3 a	0.5 a	0.3 a	0.0 a	0.3 a	0.3 a	1.3 a	2.5 a
Intruder 70WP	0.6	0.3 a	0.0 a	0.0 a	0.0 a	0.0 a	0.3 a	0.0 a	2.5 a
Intruder 70WP + COC[a]	0.4	0.3 a	0.5 a	0.0 a	0.0 a	0.3 a	0.3 a	1.3 a	2.5 a
Intruder 70WP + COC[a]	0.6	0.5 a	0.5 a	0.0 a	0.3 a	0.0 a	0.3 a	1.3 a	3.8 a
Intruder 70WP + Vydate CLV	0.4 + 8.5	0.5 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	2.5 a	2.5 a
Centric 40WG[b]	2.0	0.0 a	0.0 a	0.0 a	0.3 a	0.0 a	0.3 a	2.5 a	1.3 a
Untreated		0.0 a	0.0 a	0.5 a	0.3 a	0.3 a	0.5 a	2.5 a	3.8 a
LSD (P = 0.05)		NS	NS	NS	NS	NS	NS	NS	NS
P > F		.7958	.4002	.5458	.7240	.7240	.8614	.9398	.9973

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

[a] COC = crop oil concentrate (1.0 pint/acre).

[b] Centric 40WG (2.0 oz/acre) was applied to this treatment beginning at the full 6 leaf stage (May 7, 15, and 20). All other treatments were applied only on May 20.

Table 2. Number of fleahoppers (nymphs & adults) and lint production in cotton treated with various insecticides, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Fleahopper numbers per 100 plant terminals					
Treatment	Rate (oz/acre)	5/20 1/3 square	5/23 3 DAT	5/26 6 DAT	6/3 14 DAT	Post trt. Avg[c]	Yield (lb lint/acre)
Orthene 75SP	4.8	13.8 a	2.5 b	7.5 b	8.8 bc	6.3 b	1642 ab
Bidrin 8E	2.4	13.8 a	11.3 b	8.8 b	13.8 bc	11.2 b	1566 b
Trimax 4F	1.0	15.0 a	8.8 b	7.5 b	17.5 ab	11.3 b	1688 a
F1785 50DF	2.8	12.5 a	3.8 b	3.8 b	8.8 bc	5.4 b	1700 a
Centric 40WG	2.0	11.3 a	0.0 b	0.0 b	1.3 c	0.4 b	1681 a
Intruder 70WP	0.4	11.3 a	3.8 b	5.0 b	15.0 abc	7.9 b	1572 b
Intruder 70WP	0.6	12.5 a	0.0 b	5.0 b	13.8 bc	6.3 b	1661 a
Intruder 70WP + COC[a]	0.4	11.3 a	7.5 b	7.5 b	11.3 bc	8.7 b	1669 a
Intruder 70WP + COC[a]	0.6	16.3 a	2.5 b	8.8 b	5.0 bc	5.4 b	1702 a
Intruder 70WP + Vydate CLV	0.4 + 8.5	10.0 a	3.8 b	1.3 b	1.3 c	2.1 b	1631 ab
Centric 40WG[b]	2.0	2.5 a	2.5 b	0.0 b	6.3 bc	2.9 b	1620 ab
Untreated		11.3 a	33.8 a	28.8 a	30.0 a	30.8 a	1445 c
LSD (P = 0.05)		NS	18.44	13.84	15.78	14.16	88.7
P > F		.4006	.0533	.0211	.0480	.0177	.0001

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

[a] COC = crop oil concentrate (1.0 pt/acre).

[b] Centric 40WG (2.0 oz/acre) was applied to this treatment beginning at the full 5 leaf stage (May 7, 15, and 20). All other treatments were applied only on May 20.

[c] Post treatment averages are from 3, 6, and 14 DAT not considering.

FLEAHOPPER EFFECTS ON FM832B AND FM958B COTTON VARIETIES

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: Greater numbers of fleahoppers, especially adults, were counted on FM832B than on FM958B before treatment, but following the first treatment date, this difference was not observed. Predators consisting of lady beetles, big-eyed bugs, and pirate bugs were more abundant in plots that were not treated with insecticide. The cotton aphid was present in low numbers for the entire growing season. Fiber characteristic differences were variety related; no impact of insecticide treatment was observed on fiber characteristics. FM832B, as expected, had longer staple length. Significant differences were not found in lint production.

OBJECTIVES: The field study was conducted to determine if fleahoppers were more abundant on cotton with different leaf types (okra leaf compared to conventional leaf), and to determine if varieties responded differently to fleahoppers.

MATERIALS/METHODS: FM832B and FM958B cotton vatrieties were planted on the Texas Agricultural Experiment Station Meaney Annex at Corpus Christi on Mar 31,2003 with a 4-row blackland planter equipped with research cone seed distributors. Plots were 4 rows on 38-inch centers by 40 ft with variety and foliar treatments arranged in a randomized complete block design with 4 replications. Sorghum had been planted on the site in the previous season. Fertilizer applied was 104N-0P-0K, and herbicide consisted of Treflan pre-plant followed post-plant by Dual II Magnum (1.33 pt/acre) + Cotoran (3 pt/acre).

Centric 40WG (2.0 oz/acre) was applied to appropriate plots on May 7 and 15 with a Spyder Spray Trac traveling at 4.5 mph delivering a total spray volume of 9.5 gpa through 8X (2/row) hollowcone nozzles at a pressure of 40 psi.

Treatments were assessed by (1) counting the number of fleahoppers (nymphs and adults) on 20 plant terminals/plot on May 7 [pretreatment] when cotton growth stage was 7 true leaves, May 10 [3 DAT-1] at the pinhead square stage, May 18 [3 DAT-2] at the 1/3 grown square stage, May 21 [6 DAT-2], and May 29 [17 DAT-2]; (2) counting the number of lady beetles, pirate bugs, and big-eyed bugs on 20 plant terminals/plot on 4 dates; and (3) harvesting the two center rows of plots with a one-row spindle picker on Aug 12. Seed cotton was weighed and samples were processed on a 10-saw Eagle laboratory gin for turn-out to determine lint weight. Lint samples were sent to the International Textile Center, Lubbock, Texas for fiber analysis.

RESULTS/DISCUSSION: Fleahopper counts for nymphs, adults, and total number are shown in Tables 1,2, and 3. Pretreatment counts on the same day as treatment one ranged from 17.5 to 22.5/100 plant terminals. Three days after treatment (DAT) no fleahoppers were detected in the insecticide treated plots. Greater numbers of nymphs but fewer adults were observed in plots not treated with Centric. Fleahoppers for the season averaged 6.1% in insecticide treated plots and 24.8% in untreated plots (Table 3). The level of fleahopper control achieved was considered remarkable. As expected predator number were significantly reduced in Centric treated plots (Table 4). Fortunately an aphid infestation did not develop, and no other insecticide was applied for the season. Cotton fiber characteristics and lint production are given in Table 5. Fiber length was significantly longer for FM832B, and only insecticide treated FM958B had statistically a lower micronaire reading. No other fiber characteristic differences were observed. The different fiber characteristics reflected the variety and no effect by insecticide was observed. Surprisingly, no significant differences were observed in lint production. Based on other experiments with these numbers of fleahoppers an increased yield response to insecticide was expected. In a nearby experiment greater than 100 lb/acre yield increase was achieved with one treatment for the cotton fleahopper. Lack of yield response could have been variety difference, but it also may have been weather related. This experiment was planted 10 days earlier than the nearby experiment with large yield response following fleahopper control; plants in the present experiment may not have been able to hold an otherwise protected fruit load due to early season drought conditions. There was, however, a numerical trend as we have observed in previous years in similar field studies for more lint production in the insecticide treated plots (68 lb/acre in FM832B and 24 lb/acre in FM958B). No conclusive evidence that the okra leaf variety is more susceptible than the conventional leaf variety to fleahopper damage was observed.

ACKNOWLEDGMENTS: We thank the Texas Food and Fiber Commission for paying fiber analysis costs. Rudy Alaniz and Mike Hiller, Demonstration Assistants; Jeremy Salinas, Intern; and Clint Livingston, Technician I, are thanked for their assistance with planting, harvest, and ginning.

Table 1. Number of fleahopper **nymphs** on FM 832 and FM 958 cotton varieties, with and without insecticide treatment, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Number/100 plant terminal					
Variety	Insecticide treated[a]	Pretrt.	3 DAT-1[b]	3 DAT-2	6 DAT-2	17 DAT-2	Season Avg.
FM 832 B	Yes	17.5 a	0.0 b	0.0 b	0.0 b	3.8 bc	4.3 b
	No	22.5 a	20.0 a	27.5 a	12.5 a	16.3 ab	19.8 a
FM 958 B	Yes	12.5 a	0.0 b	0.0 b	0.0 b	0.0 c	2.5 b
	No	18.8 a	20.0 a	13.8 ab	17.5 a	20.0 a	18.0 a
P = 0.05		NS	16.65	15.79	10.83	15.66	9.83
P > F		.0637	.0272	.0095	.0104	.0498	.0052

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Centric 40WG (2.0 oz/acre) was applied on May 7, 15.
[b] DAT = days after treatment.

Table 2. Number of fleahopper **adults** on FM 832 and FM 958 cotton varieties, with and without insecticide treatment, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Number/100 plant terminal					
Variety	Insecticide treated[a]	Pretrt.	3 DAT-1[b]	3 DAT-2	6 DAT-2	17 DAT-2	Season Avg.
FM 832 B	Yes	12.5 a	0.0 a	1.3 b	0.0 b	1.3 a	3.0 b
	No	10.0 ab	1.3 a	8.8 a	12.5 a	5.0 a	7.5 a
FM 958 B	Yes	7.5 bc	0.0 a	0.0 b	1.3 b	2.5 a	2.3 b
	No	5.0 c	3.8 a	3.8 ab	6.3 ab	2.5 a	4.3 b
P = 0.05		4.21	NS	5.37	8.84	NS	2.67
P > F		.0157	.2172	.0222	.0402	.1482	.0073

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Centric 40WG (2.0 oz/acre) was applied on May 7, 15.
[b] DAT = days after treatment.

Table 3. Number of fleahopper (nymphs and adults) on FM 832 and FM 958 cotton varieties, with and without insecticide treatment, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Number/100 plant terminal					
Variety	Insecticide treated[a]	Pretrt.	3 DAT-1[b]	3 DAT-2	6 DAT-2	17 DAT-2	Season Avg.
FM 832 B	Yes	30.0 a	0.0 b	1.3 b	0.0 b	5.0 a	7.3 b
	No	32.5 a	21.3 a	36.3 a	25.0 a	21.3 a	27.3 a
FM 958 B	Yes	20.0 b	0.0 b	0.0 b	1.3 b	2.5 a	4.8 b
	No	23.8 b	23.8 a	17.5 b	23.8 a	22.5 a	22.3 a
P = 0.05		6.00	13.98	17.68	17.48	NS	3.77
P > F		.0040	.0047	.0038	.0136	.0581	.0047

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Centric 40WG (2.0 oz/acre) was applied on May 7, 15.
[b] DAT = days after treatment.

Table 4. Number of insect predators on FM 832 and FM 958 cotton varieties, with and without insecticide treatment, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		Number/20 plant terminals				
Variety	Insecticide treated[a]	3 DAT-1[b]	3 DAT-2	6 DAT-2	17 DAT-2	Season Avg.[c]
FM 832 B	Yes	1.0 b	0.5 a	0.0 c	1.0 bc	0.6 b
	No	6.3 a	2.0 a	2.5 a	4.8 a	3.9 a
FM 958 B	Yes	1.0 b	0.3 a	0.5 bc	0.0 c	0.4 b
	No	7.8 a	2.3 a	1.8 ab	1.8 b	3.4 a
P = 0.05		3.77	NS	1.466	1.62	1.07
P > F		.0047	.2427	.0141	.0006	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Centric 40WG (2.0 oz/acre) was applied on May 7, 15.
[b] DAT = days after treatment.
[c] Predators consisted of lady beetles (55.2%), pirate bugs (13.4%), and big-eyed bugs (31.4%).

Table 5. Cotton fiber characteristics and lint yield by spindle picker harvest of FM 832 and FM 958 cotton varieties, with and without insecticide treatment for fleahoppers, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Variety	Insecticide treated[a]	Micronaire	Length	Uniformity	Strength (g/tex)	Yield (lb lint/acre)
FM 832 B	Yes	4.7 a	1.17 a	84.9 a	32.6 a	1419 a
	No	4.8 a	1.18 a	84.4 a	33.5 a	1351 a
FM 958 B	Yes	4.4 b	1.11 b	84.2 a	33.5 a	1419 a
	No	4.7 a	1.12 b	84.6 a	33.1 a	1395 a
P = 0.05		0.17	.029	NS	NS	NS
P > F		.0136	.0006	.3322	.5805	.5382

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Centric 40WG (2.0 oz/acre) was applied on May 7, 15.

COMPARISON OF SYNGENTA VIPCOT TRANSGENIC COTTON WITH COKER 312 COTTON WITH AND WITHOUT FOLIAR INSECTICIDE

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: Due to lack of seed vigor in Coker 312 variety cotton, plant stands were reduced, and the VipCot transgenic cotton (VipCot) plots were subsequently thinned to bring plant stand counts nearer the same. The bollworm larval infestation in unsprayed Coker 312 compared with other treatments was significantly greater on two of 8 inspection dates and for the season average. Significantly fewer bollworm larvae were detected in VipCot plots on several dates and for the season average. Bollworm damaged terminals, squares, and flowers reflected similar differences in season average counts. For season average bloom tag and boll damage by bollworm, sprayed Coker 312 was not different from VipCot statistically. Significantly fewer bolls were harvested, and a trend for more bolls required for a pound of lint cotton was found for unsprayed Coker 312. Sprayed VipCot, VipCot, and sprayed Coker 312 as measured by hand harvest, produced significantly more lint than unsprayed Cocker 312. However, lint production measured by spindle harvest showed significantly more lint produced in both VipCot treatments compared with Coker 312, and the sprayed Coker 312 produced significantly more cotton than unsprayed Coker 312.

OBJECTIVES: Experimental objectives were to (1) evaluate VipCot technology for control of caterpillars, (2) compare VipCot technology to non-transgenic cotton, and (3) estimate duration of caterpillar control with VipCot.

MATERIALS/METHODS: The experiment was planted at the Texas Agricultural Experiment Station, Corpus Christi on Apr 16, 2003 with a 4-row blackland planter equipped with research cone seed distributors. Individual plots were 8 rows on 38-inch centers by 30 ft, and treatments were arranged in a randomized complete block design with 4 replications. Two cotton varieties (VipCot and Coker 312) were either treated or untreated for caterpillars. Required buffers of 40 ft of non-transgenic cotton were planted surrounding the entire experiment. The buffer rows and the experimental cotton were destroyed to comply with USDA/EPA requirements, and the site will be monitored for one year for regrowth or seedling emergence. Sorghum had been planted on the site the previous season. Fertilizer applied was 104-0-0, and herbicide consisted of Treflan pre-plant followed post-plant by Dual II Magnum (1.33 pt/acre) + Cotoran (3 pt/acre).

Insecticide was applied to the entire experiment for the cotton fleahopper (Centric 40WG at 2.0 oz/acre on May 20 and 1.25 oz/acre on Jun 3), and Bidrin 8E (8.0 oz/acre) was applied for the stink bug (*Euschistus quadrator*) on Jul 3. Pix (6.0 oz/acre) was applied for plant growth control on Jun 19.

Denim .16EC (8.0 oz/acre) was applied to the sprayed Coker 312 treatment on Jun 3 and 18. Karate 2.08EC (2.56 oz/acre) was applied to the sprayed Coker 312 treatment and to the sprayed VipCot sprayed treatment on Jun 24. The three treatments were made with a Spyder SprayTrac traveling at 2.5 mph delivering a total spray volume of 9.7 gpa through 4X (2/row) hollowcone nozzles at a pressure of 40psi.

Treatments were assessed by (1) counting the number of plants on 13.75 ft row on each of the center 4 rows in plots on Apr 24, again after thinning of the VipCot plots on May 4, and on 13.75 ft row in the hand harvest area on Aug 15; (2) counting the number of Heliothine eggs on 25 plant terminals, number of larvae on the middle and upper portion of 25 plants, and number of worm damaged squares in 25 examined on Jun 2, Jun 6 [3 DAT-1], Jun 14 [11 DAT-1], Jun 18 [15 DAT-1], Jun 21 [3 DAT-2], Jun 24 [6 DAT-2], Jun 28 [4 DAT-3], and Jul 2 [8 DAT-3]; (3) looking for bollworm damaged plant terminals on 25 plants/plot on Jun 2, 3 DAT-1, 3 DAT-2, 6 DAT-2, and 4 DAT-3; (4) examining 25 flowers and bloom tags/plot for worm damage on 4 dates; (5) examining 25 green bolls per plot for worm damage on 8 dates, (6) collecting larvae in untreated Coker 312 plots on Jun 15, 24 and 28 to determine species composition [budworm/bollworm], and collecting Heliothine eggs from all plots on the same dates to determine gross egg parasitism rates, (7) harvesting by hand 13.75 ft row from the 2nd row in each plot on Aug 15 and Aug 21; and (8) harvesting 3 rows per plot with a one-row spindle picker on Aug 21. Hand harvested seed cotton samples and a portion of the machine harvested samples were processed on a 10-saw Eagle laboratory gin to determine lint yield. Much of the insect count and damage data were converted to number per 100 units.

RESULTS/DISCUSSION: The bollworm (*Heliocoverpa zea*) comprised 93, 91, and 88% of the caterpillar population on June 15, 24 and 28, respectively, compared with tobacco budworm. Gross egg parasitism rates by Trichogramma wasp amounted to 30, 61, and 80% of the eggs collected. The actual parasitism rate is lower due to accumulation of parasitized eggs on plants. Bollworm moth egg laying exceeded 25/100 plants on Jun 14 and remained above 25/100 plants for the next 4 inspection dates ending on Jun 28 (Table 1). Bollworm numbers exceeded treatment threshold in Coker 312 on 7 of the 8 inspection dates, and barely reached treatment threshold in the VipCot plots on Jun 24 (Table 2). Bollworm damaged terminals were found in all treatments, but larvae developing to large enough size to damage squares was greatly restricted in VipCot (Table 4). Damaged square counts were also significantly reduced in sprayed Coker 312. Worm damage to white blooms was significantly reduced in VipCot compared with the Coker 312, and sprayed Coker 312 contained less damage than sprayed Coker 312 for season average counts (Table 5). Although bloom tag damage was greater in sprayed Coker 312 for season average counts, this type damage in VipCot plots appeared to be elevated. The greatest degree of bollworm damage in VipCot was detected on the tagged blooms. Bollworm larvae may more likely be found in VipCot in bloom tags than at any other site. Boll damage averaged 10.3% in untreated Coker 312 which was significantly greater than that in other treatments (Table 6). As discussed earlier, Coker 312 seed viability was poor, but we had actually over-planted seed so that about 1/3 of the seedling plants were hand thinned in all VipCot plots so that a better comparison could be made with the lower

Coker 312 plant stand (Table 7). Even then, significantly more plants were present in VipCot plots. Significantly fewer bolls were harvested in unsprayed Coker 312 plots than in the other treatments (Table 8). Statistically, except in one case, fewer VipCot bolls were required to produce a pound of lint on hand harvest 1 than required of the Coker 312. Lint production by hand and machine harvest methods is shown in Table 9. Significantly more lint was produced in hand harvest 1 in the sprayed VipCot treatment compared with all other treatments except for the untreated VipCot. Data for machine harvested cotton was more uniform (lower LSD of 70.9 lb); VipCot produced significantly more lint than the Coker 312. Furthermore, treated Coker 312 yielded more lint than did untreated Coker 312.

The Syngenta VipCot transgenic cotton was effective in reducing bollworm damage and subsequently produced more lint than the Coker 312. It should provide for producers, when labeled, effective control of several caterpillar pests.

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Table 1. Bollworm eggs in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	Bollworm eggs/100 terminals[b]								
		6/2	6/6	6/14	6/18	6/21	6/24	6/28	7/2	Avg
VipCot	No	7 a	0 a	29 a	34 a	52 a	45 a	24 a	14 a	25.6 a
Coker 312	No	17 a	0 a	30 a	37 a	67 a	52 a	33 a	10 a	30.8 a
VipCot	Yes	1 a	0 a	25 a	42 a	56 a	41 a	20 a	11 a	24.5 a
Coker 312	Yes	6 a	0 a	35 a	37 a	49 a	54 a	24 a	10 a	26.9 a
LSD (P = 0.05)		NA	NA	NA	NA	NA	NA	NA	NA	NA
P > F		.082	1.00	.780	.428	.586	.862	.617	.837	.320

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

[b] A total of 25 terminals were examined/plot.

Table 2. Bollworm larvae in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	Bollworm larvae/100 plants[b]								
		6/2	6/6	6/14	6/18	6/21	6/24	6/28	7/2	Avg
VipCot	No	0 b	0 a	0 a	1 bc	0 a	5 c	3 b	4 a	1.6 c
Coker 312	No	15 a	6 a	0 a	5 ab	7 a	30 a	42 a	16 a	15.1 a
VipCot	Yes	0 b	0 a	0 a	0 c	2 a	6 c	1 b	0 a	1.1 c
Coker 312	Yes	16 a	3 a	1 a	6 a	2 a	17 b	7 b	6 a	7.3 b
LSD (P = 0.05)		5.464	NA	NA	4.768	NA	8.328	20.63	NA	4.66
P > F		.0001	.1936	.4363	.0489	.1855	.0002	.0045	.0675	.003

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

[b] Upper and middle portion of 25 plants were examined/plot.

Table 3. Damage to plant terminals in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	% bollworm damaged plant terminals[b]							
		6/2	6/6	6/14	6/18	6/21	6/24	6/28	Avg
VipCot	No	4 c	3 b	-	-	3 c	2 b	8 b	4.0 c
Coker 312	No	25 b	14 a	-	-	29 a	26 a	25 a	23.8 a
VipCot	Yes	3 c	0 b	-	-	8 bc	4 b	5 b	4.0 c
Coker 312	Yes	34 a	9 ab	-	-	14 b	20 a	20 a	19.4 b
LSD (P = 0.05)		7.31	9.60			7.46	7.98	10.28	3.22
P > F		.0001	.0378			.0001	.0002	.0048	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.
[b] A total of 25 terminals were examined/plot.

Table 4. Bollworm damaged squares in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	% damaged squares[b]								
		6/2	6/6	6/14	6/18	6/21	6/24	6/28	7/2	Avg
VipCot	No	0 b	0 b	0 a	0 b	0 a	1 b	1 b	4 b	0.8 c
Coker 312	No	13 a	17 a	1 a	4 a	5 a	10 a	17 a	14 a	10.2 a
VipCot	Yes	0 b	0 b	1 a	0 b	1 a	0 b	0 b	0 b	0.3 c
Coker 312	Yes	17 a	4 b	2 a	1 b	3 a	2 b	5 b	3 b	4.6 b
LSD (P = 0.05)		7.464	9.788	NS	1.6	NS	5.252	6.24	5.864	1.108
P > F		.0009	.0103	.5493	.0009	.1066	.0072	.0006	.0023	.0001

Means in a column followed by the same letter are not significantly different by ANOVA.
[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.
[b] A total of 25 squares were examined/plot.

Table 5. Bollworm damaged white flowers and bloom tags in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		% worm damage[b]									
		flowers					bloom tags				
Cultivar	Foliar insecticide[a]	6/21	6/24	6/28	7/2	Avg	6/21	6/24	6/28	7/2	Avg
VipCot	No	0 b	1 c	0 b	1 a	1 c	1 a	5 a	8 a	2 b	4.0 b
Coker 312	No	4 a	15 a	19 a	10 a	12 a	6 a	15 a	18 a	19 a	14.5 a
VipCot	Yes	0 b	2 c	1 b	1 a	1 c	2 a	6 a	3 a	0 b	2.8 b
Coker 312	Yes	1 ab	8 b	2 a	5 a	4 b	4 a	7 a	4 a	6 b	5.2 b
LSD (P = 0.05)		3.06	4.89	7.76	NA	2.12	NA	NA	NA	7.25	4.308
P > F		.0486	.0004	.0010	.1204	.0001	.2888	.1850	.0671	.0009	.0001

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

[b] A total of 25 white flowers and 25 bloom tags were examined/plot. Bloom tag damage was counted if the boll was damaged beneath the bloom tag.

Table 6. Bollworm damaged bolls in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

		% bollworm damaged bolls[b]							
Cultivar	Foliar insecticide[a]	6/14	6/18	6/21	6/24	6/28	7/2	7/7	Avg
VipCot	No	0 a	0 a	0 a	0 a	0 b	1 b	2 b	0.4 b
Coker 312	No	0 a	0 a	2 a	5 a	22 a	18 a	25 a	10.3 a
VipCot	Yes	0 a	0 a	0 a	1 a	0 b	0 b	5 b	0.9 b
Coker 312	Yes	0 a	0 a	0 a	5 a	4 b	4 b	6 b	2.7 b
LSD (P = 0.05)		NS	NS	NS	NS	11.03	10.78	11.03	2.960
P > F		1.00	1.00	.0877	.2326	.0041	.0148	.0042	.0001

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

[b] A total of 25 bolls were examined/plot.

Table 7. Plant population before and after thinning, in hand harvested area, and percentage lint in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	Plants (1000's/acre)[b]			% turnout[c]	
		4/24	5/4	8/15	H_1	H_2
VipCot	No	76.0 a	40.7 a	40.0 ab	38.4 a	36.6 a
Coker 312	No	31.2 b	32.0 b	28.5 c	37.4 b	35.5 a
VipCot	Yes	76.9 a	40.8 a	43.3 a	38.6 a	37.8 a
Coker 312	Yes	30.7 b	30.0 b	34.8 bc	37.3 b	35.8 a
LSD (P = 0.05)		6.52	5.63	7.26	0.93	NS
P > F		.0001	.0026	.0064	.0225	.1394

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

[b] Plant population on 4/24 represents original stands and on 5/4 after hand thinning VipCot plots.

[c] H_1 = hand harvest 1 (8/15) and H_2 = hand harvest 2 (8/21).

Table 8. Number of harvested bolls and weights of bolls in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	Harvested bolls (1000's/acre)[b]			Bolls/lint lb	
		H_1	H_2	Total	H_1	H_2
VipCot	No	324 a	25.8 c	350 a	259 bc	371 a
Coker 312	No	244 b	46.3 ab	290 b	274 ab	345 a
VipCot	Yes	340 a	30.0 bc	370 a	256 c	356 a
Coker 312	Yes	316 a	60.8 a	377 a	276 a	379 a
LSD (P = 0.05)		34.57	17.32	43.6	16.4	NA
P > F		.0007	.0049	.0060	.0490	.3900

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

[b] H_1 = hand harvest 1 (8/15) and H_2 = hand harvest 2 (8/21).

Table 9. Cotton production as measured by hand and spindle picker harvest in transgenic B.t. and non-transgenic cotton cultivars with and without foliar insecticide for caterpillar control, Texas Agricultural Experiment Station, Nueces County, TX, 2003.

Cultivar	Foliar insecticide[a]	Lb lint/acre (hand) H_1	H_2	Total	Lb lint/acre machine harvest
VipCot	No	1247 ab	70 c	1317 a	1339 a
Coker 312	No	894 c	134 ab	1027 b	1025 c
VipCot	Yes	1324 a	84 bc	1409 a	1369 a
Coker 312	Yes	1148 b	161 a	1309 a	1182 b
LSD (P = 0.05)		147.1	49.3	179.1	70.9
P > F		.0005	.0079	.0051	.0001

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

[a] Foliar insecticide was Denim .16EC (8.0/oz acre) on 6/3 and 6/18 to Coker 312 and Karate Z 2.08SC (2.56 oz/acre) was applied on 6/24 to Coker and VipCot.

COMPARISON OF INSECTICIDES FOR CONTROL OF BOLLWORM IN COTTON

Peter Tischler Farm, Nueces County, 2003

Roy D. Parker and Stephen D. Livingston
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi, Texas

SUMMARY: A sustained bollworm population was not maintained, and only slight numerical differences between insecticide treated and untreated cotton were observed in bollworm larval numbers, damaged squares, and damaged bolls. Post treatment averages for larval numbers, square damage, and boll damage were not statistically different, but in untreated cotton greater numbers or damage was apparent for each of these factors. Due to lack of statistical differences in insect numbers and damage, it was not possible to comment on insecticide effectiveness. Although lint yields were not statistically different at the 5% level, there were differences detected at the 9% level and the insecticide treated cotton had a yield level ranging from 12 to 170 lb/acre lint more than the untreated cotton.

OBJECTIVE: The study was designed to compare insecticides for effectiveness in controlling caterpillar pests, especially bollworm, and to determine impact of these treatments on cotton productions.

MATERIALS/METHODS: FiberMax 991RR variety cotton was planted Apr 1, 2003 on the Peter Tischler Farm near the intersection of Highway 44 and Carl Allen Road. Rows were on 30-inch centers. Just before treatments were applied 4-row wide by 40 ft plots were laid out and 2 ft wide alleys were cut to separate replicates. The experiment was arranged in a randomized complete block design with 4 replications. Insecticide treatments were applied Jun 20 to each 4-row plot with a Spyder Trac II self-propelled sprayer equipped with 2, 4X hollowcone nozzles/row delivering a total spray volume of 9.7 gpa at 40 psi traveling at 2.5 mph.

Treatments were assessed by (1) counting the number of larvae [92% bollworms] on 40 squares and bolls on June 19 [pretreatment] and on 3, 6, and 11 DAT [days after treatment], (2) examining 20 squares/plot for bollworm damage 1 day before treatment, and 3, 6, and 11 DAT, (3) examining 20, 10-18 day old bolls/plot for bollworm damage 3, 6, 11, and 20 DAT, and (4) harvesting one of the center two rows in each plot with a 1-row spindle picker, weighing the seed cotton, and obtaining a sample for ginning to determine lint percentage. Seed cotton was processed on a 10-saw Eagle laboratory gin. Thirty gram samples of lint from each plot were sent to the International Textile center, Lubbock, TX, for determination of fiber characteristics.

RESULTS/DISCUSSION: Bollworm populations were not maintained at high enough levels in the experiment to produce significant damage although untreated cotton contained slightly greater numbers (Table 1). Differences were not found in damaged squares, or bolls, and only slight numerical increases were noted in damage measurements in untreated cotton (Tables 2 and 3). Micronaire, length and strength measurements exhibited no differences (Table 4). All insecticide treated cotton produced numerically more lint compared to untreated cotton, ranging from 12-170 lb/acre more; the average yield increase in insecticide treated cotton was 73 lb/acre. Analysis of variance showed a probability level of .0902 (9% level of probability) which in some circles would be accepted as significant. We accept 0.05 or less. Therefore, one might conclude that there was an impact of insecticide on lint production.

ACKNOWLEDGMENTS: Thanks are extended to Peter Tischler for providing a site for this experiment and modifying his production operation to accommodate our work. We acknowledge Rudy Alaniz and Mike Hiller, Demonstration Aides; Jeremy Salinas, Intern; and Clint Livingston, Tech I, for assistance in conducting the field study. Special thanks are extended to DuPont, Dow, Valent and BASF Companies for their support of this work. We also thank the Texas Food and Fiber Commission for paying for fiber analysis.

Table 1. Bollworm larvae in cotton treated with various insecticides, Tischler Farms, Nueces County, TX, 2003.

		Larvae/100 fruiting forms				
Treatment	Rate (lb ai/acre)	Pretrt.	3 DAT	6 DAT	11 DAT	Post trt avg
Steward	.104	3.8 a	1.3 a	1.9 a	4.4 a	2.5 a
Steward + Asana	.09 + .037	7.5 a	1.3 a	2.5 a	5.0 a	2.9 a
Steward + Asana	.078 + .037	5.0 a	3.1 a	0.6 a	4.4 a	2.7 a
Tracer	.067	6.3 a	1.3 a	1.9 a	1.3 a	1.5 a
XDE-225	.02	6.3 a	1.9 a	0.6 a	0.0 a	0.8 a
Karate	.04	6.3 a	1.3 a	0.6 a	0.6 a	0.8 a
S-1825	.15	5.0 a	1.3 a	0.6 a	0.6 a	0.8 a
Untreated		5.0 a	3.1 a	1.9 a	4.4 a	3.2 a
LSD (P = 0.05)		NS	NS	NS	NS	NS
P > F		.9297	.6458	.8024	.1810	.2412

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

Table 2. Squares damaged by bollworm in cotton treated with various insecticides, Tischler Farm, Nueces County, TX, 2003.

Treatment	Rate (lb ai/acre)	Damaged squares/100				
		Pretrt.	3 DAT	6 DAT	11 DAT	Post trt avg
Steward	.104	0.0 a	1.3 a	0.0 a	5.0 a	2.0 a
Steward + Asana	.09 + .037	0.0 a	2.5 a	5.0 a	5.0 a	4.1 a
Steward + Asana	.078 + .037	0.0 a	2.5 a	3.8 a	8.8 a	5.0 a
Tracer	.067	1.3 a	0.0 a	3.8 a	1.3 a	1.7 a
XDE-225	.02	1.3 a	1.3 a	2.5 a	2.5 a	2.0 a
Karate	.04	0.0 a	0.0 a	0.0 a	1.3 a	0.4 a
S-1825	.15	0.0 a	3.8 a	3.8 a	0.0 a	2.5 a
Untreated		0.0 a	7.5 a	5.0 a	7.5 a	6.6 a
LSD (P = 0.05)		NS	NS	NS	NS	NS
P > F		.5828	.1304	.1916	.4396	.1077

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

Table 3. Bolls damaged by bollworm in cotton treated with various insecticides, Tischler Farms, Nueces County, TX, 2003.

Treatment	Rate (lb ai/acre)	Damaged bolls/100				
		3 DAT	6 DAT	11 DAT	20 DAT	Post trt avg
Steward	.104	3.8 a	3.8 a	7.5 a	2.5 a	4.6 a
Steward + Asana	.09 + .037	2.5 a	6.3 a	11.3 a	1.3 a	5.4 a
Steward + Asana	.078 + .037	3.8 a	3.8 a	6.3 a	3.8 a	4.5 a
Tracer	.067	1.3 a	3.8 a	7.5 a	5.0 a	4.6 a
XDE-225	.02	2.5 a	3.8 a	5.0 a	0.0 a	2.8 a
Karate	.04	6.3 a	7.5 a	6.3 a	1.3 a	5.4 a
S-1825	.15	0.0 a	1.3 a	7.5 a	3.8 a	3.2 a
Untreated		5.0 a	6.3 a	13.8 a	3.8 a	7.3 a
LSD (P = 0.05)		NS	NS	NS	NS	NS
P > F		.6709	.7744	.5814	.5754	.3739

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

Table 4. Fiber characteristics and lint production of cotton treated with various insecticides, Tischler Farms, Nueces County, TX, 2003.

Treatment	Rate (lb ai/acre)	Fiber characteristics: Micronaire	Length	Strength	Yield (lb lint/acre)
Steward	.104	4.6 a	1.15 a	32.5 a	1430 a
Steward + Asana	.09 + .037	4.7 a	1.15 a	33.2 a	1396 a
Steward + Asana	.078 + .037	4.7 a	1.16 a	33.1 a	1412 a
Tracer	.067	4.7 a	1.17 a	33.6 a	1480 a
XDE-225	.02	4.7 a	1.16 a	32.4 a	1476 a
Karate	.04	4.6 a	1.17 a	33.6 a	1554 a
S-1825	.15	4.6 a	1.14 a	33.1 a	1451 a
Untreated		4.8 a	1.15 a	33.5 a	1384 a
LSD (P = 0.05)		NS	NS	NS	NS
P > F		.7450	.2730	.7443	.0902

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

BOLL WEEVIL NUMBERS IN PHEROMONE TRAPS IN NUECES AND SAN PATRICIO COUNTIES COMPARING YEARS BEFORE AND DURING THE ERADICATION PROGRAM

Roy D. Parker
Extension Entomologist
Corpus Christi, Texas

SUMMARY: There has been a steady yearly decline in boll weevil numbers captured in pheromone traps since initiation of eradication in the South Texas/Wintergarden Eradication zone. The average pheromone trap catch per month has declined from 117.9/trap (6 year average 1977-1982) to .0033/trap (2003). Boll weevil eradication is a process of slow attrition as long as continued pressure is applied to the population.

Eradication in this region is more difficult and costly compared with areas to the north due to the sub-tropical climate which allows boll weevil reproduction anytime cotton is present during the year. Additionally, sustained winds (day and night) and long periods of rainfall contribute to more difficulty in the elimination of the boll weevil in this zone. However, the major challenge now facing this zone is lack of eradication south of the zone and boll weevil movement into the zone in Victoria and Calhoun counties from the recently initiated Upper Gulf Coast Boll Weevil Eradication Program. If these two areas had been in operation as originally planned, no doubt the South Texas/Winter Garden BWE zone would be paying the debt off as initially planned.

OBJECTIVE: Pheromone traps were operated to evaluate the impact of boll weevil eradication on relative population levels.

MATERIALS/METHODS: A total of 18 traps were operated at 3 locations from 1988 - 2001. Since 2002 a total of 24 traps have been in place. Traps are deployed as follows: Welder Wildlife Foundation north of Sinton (10 traps), south of Orange Grove and east of Alfred (5 traps) and west of Clarkwood (9 traps). Traps were inspected weekly and pheromone + insecticide strip were changed every other week. The data used before eradication was collected by Segers et al. during a 6-year period (1977-1982).

RESULTS/DISCUSSION: Early season boll weevil numbers were actually higher in 1998, the first full season of boll weevil eradication (BWE), compared with the pre-eradication trap captures (Table 1). A series of warm winters is believed to have contributed to increased boll weevil activity just before and in the early years of BWE. The BWE program was operated as a "fall" treatment program in the South Texas/Wintergarden zone in 1996 and 1997. During the mid-season of 1999 boll weevils increased to greater numbers than 1998 for the last 5 months of the year. Favorable weather conditions, rainfall that resulted in poor stalk destruction and relatively high thresholds for treatments all contributed to this increase. In 2000 a more aggressive treatment program was initiated; since that time boll weevil numbers have steadily declined based on the month by month comparison. Since program initiation, the average trap catch/month for the year has steadily declined. The average decline per month in 2003 compared with the pre-eradication 6-year average has been 99.99%.

ACKNOWLEDGMENTS: Thanks are extended to Rudy Alaniz and Mike Hiller for inspecting traps on certain dates during the year.

Table 1. Boll weevils per pheromone trap per month, Texas Cooperative Extension operated traps, 1998-2002.

Month	1977-82 (6 yr avg)[a]	1998	1999	2000	2001	2002	2003
Jan	5.3	0.22	0.22	9.93	0.00	.05	.00
Feb	5.5	0.27	0.00	1.60	0.00	.00	.00
Mar	7.7	3.00	0.33	1.72	0.11	.10	.00
Apr	7.4	30.94	0.00	1.27	0.11	.05	.00
May	2.8	22.00	0.00	0.83	0.17	.05	.00
Jun	4.9	5.10	0.06	0.67	0.00	.00	.00
Jul	188.9	49.50	2.06	11.33	0.35	.00	.00
Aug	645.7	48.40	45.00	14.04	0.94	.17	.04
Sep	309.7	2.28	40.90	1.39	0.11	.00	.00
Oct	165.4	1.39	5.72	0.72	0.06	.00	.00
Nov	55.3	0.28	28.30	0.50	0.11	.00	.00
Dec	15.7	0.22	13.67	0.03	0.00	.00	.00
Average	117.9	13.60	11.40	3.67	0.16	.035	.0033

[a] Traps operated by Segers et al.

EVALUATION OF SKIP-ROW COTTON IN THE TEXAS UPPER COAST

Arthure Mahalitc and Sons Farm, Colorado County, 2003

Dan D. Fromme, Roy D. Parker, and Lawrence L. Falconer
Extension Agent-IPM, Extension Entomologist, and Extension Economist, respectively
Wharton and Corpus Christi, Texas

SUMMARY: In this study cotton yields were significantly reduced with skip-row when compared to conventional planted cotton. The number of days to cutout was increased significantly for skip-row cotton. A partial budget was developed to compare differences in costs and returns for the two planting patterns. Net returns per acre were higher for the conventional planted cotton. Input costs were reduced with skip-row; however, reduced costs were offset by the increased yields and higher revenue in the conventional planted cotton.

OBJECTIVES: Reduced inputs from skip-row planted cotton include less seed being planted and associated reduction in technology fees. Also, in-furrow insecticides, fungicides, starter fertilizers, and banded pre-emergence herbicides can be reduced with skip-row planted cotton. With equipment modifications, more land area is covered with planters and harvesters increasing the efficiency of these operations. However, in Georgia cotton yields were generally reduced with skip-row in high yielding environments (Jost et al.,2003). This field study was conducted to compare the yield and net returns of skip row (2x1) to conventional planted cotton.

MATERIALS/METHODS: A field study was conducted at Arthur Mahalitc & Sons dryland farm located south of Eagle Lake in Colorado County. Fiber Max 832B was planted on April 1, 2003 into a Norwood soil. A 2x1 skip-row planting pattern was compared to conventional planted cotton at two different seeding rates (33,800 and 50,820 seed/acre). Treatments were arranged in a 2x2 factorial experiment in a randomized complete block design. Each treatment was replicated three times. Rows were spaced on 36-inch centers. Plot sizes were eight rows by 900 feet long. For the skip row treatments, a 2x1 configuration was obtained by not planting rows three and six.

Treatment effects were assessed by utilizing COTMAN to record nodes above white flower counts on a weekly basis until cutout (NAWF=5) date. Weekly nodes above white flower values were obtained by sampling ten plants from each plot. Twenty plants per plot were measured at the end of the season to determine final plant height. Number of bolls and number of bolls to produce a pound of lint were obtained by hand-harvesting one-thousandth of an acre at three different places in each plot. Seed cotton yields were obtained by machine harvesting the middle two rows of each plot and weight was determined with a portable cotton weigh wagon. A grab sample of approximately 600 grams of seed cotton from each of the plots was ginned on a 10-saw Eagle laboratory gin to determine lint yield and turnout. Fiber samples were sent to the International Textile Center at Lubbock, Texas for quality measurement determination.

A partial budget was developed for the economic analysis. Only the costs that vary between the treatments were considered in this approach. Net advantage per acre was considered to be the difference in treatment variable costs subtracted from the difference in the crop value for the respective treatments.

Input savings included seed, technology fee, in-furrow insecticide, banded herbicide application and picking charge per acre. The test was planted at 3.5 seed/foot (50,820 seeds per acre conventional and 33,800 seeds per acre skip-row), Temik 15G was applied at 3.0 lbs/acre, and Fluometuron 4L (.75 pints/acre) + Dual II Magnum (.4 pints/acre).

Four row harvesting equipment was used, and it was assumed that four rows of cotton were picked without operating a picker head in an unplanted row. The efficiency of the skip-row picking operation was assumed to increase 24% in relation to conventional planted due to this modification. The cost of the assumed picker modification was included in the partial budget.

Statistical analysis used was the general linear model in SAS (8.2) and means were separated using Fisher's Protected LSD at the 5% level.

RESULTS/DISCUSSION: Significant differences in number of days to cutout were found between the skip-row (92.33 days) and conventional row (87.83 days) treatments. No significant differences in number of days to cutout were found between the two plant populations (Table 1).

Final plant height was significantly higher for the skip-row pattern compared to the conventional planted cotton. However, no significant differences were observed between the two plant populations (Table 2).

Total number of bolls was significantly higher for the conventional row versus the skip-row planted cotton. No differences in total number of bolls were found between the two plant populations (Table 3). No significant differences in number of bolls to produce a pound of lint were found between the two planting patterns and the two plant populations (Table 4).

Lint yield was significantly higher for the conventional row (1342 lbs/acre) versus the skip-row (1202 lbs/acre) planted cotton. However, no significant differences were observed between the two plant populations (Table 5).

No significant differences in length, micronaire, strength, elongation, and uniformity were found between the two planting patterns and the two plant populations.

Costs associated with the skip-row pattern were $45.44 less per acre; however, net returns for conventional planted cotton were $37.58 per acre more than skip-row due to the increased lint and cotton seed yields (Table 6). The $45.44 per acre cost differential includes savings from skip-row picking efficiency and ginning costs savings due to lower yields in the skip row planted cotton. In a three year study in Mississippi, an average of $66.36 in direct costs and $18.75 in fixed costs were saved in skip-row cotton production (Parvin et al., 2002). Because the Mississippi study assumed a change to a larger equipment complement that is not applicable to this study, only fixed costs savings related to the per acre picking charge were include in this study.

Overall production costs were reduced with the skip-row planted cotton. However, lint yield was significantly less when compared to conventional planted cotton in this high yielding environment. Net returns were higher from the conventional planted cotton. Reduced input costs from the skip-row planted cotton were not enough to offset the higher yields from the conventional planted cotton. Number of days to cutout was increased significantly with skip-row planted cotton, which means more days exposed to end of season rainfall from tropical storms and hurricanes.

ACKNOWLEDGMENTS: We appreciate the Mahalitc family for their continued support, labor, and equipment in conducting this field study. A special thanks is given to Jim Bosch, Technical Service Agronomist, Delta Pine Land Company, for his help with harvest.

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Table 1. Number of days to cutout (NAWF = 5)

Plant pop.	Skip row	Conventional	Pr > F .2644
50,820	92.00	87.00	89.50 a
33,800	92.67	88.67	90.67 a
Pr > F .0032	92.33 a	87.83 b	

Table 2. Final plant height (inches)

Plant pop.	Skip row	Conventional	Pr > F .8028
50,820	39.08	34.25	36.67 a
33,800	39.50	34.33	36.92 a
Pr > F .0020	39.29 a	34.29 b	

Table 3. Total number of open bolls (1000's/acre)

Plant pop.	Skip row	Conventional	Pr > F .1321
50,820	284.99	336.99	310.99 a
33,800	282.02	318.01	300.02 a
Pr > F .0004	283.51 a	327.50 a	

Table 4. Number of bolls to produce a pound of lint

Plant pop.	Skip row	Conventional	Pr > F .2560
50,820	219.00	229.67	224.33 a
33,800	224.33	214.67	219.50 a
Pr > F .9009	221.67 a	222.17 a	

Table 5. Lint yield (pounds per acre)

Plant pop.	Skip row	Conventional	Pr > F .5413
50,820	1192	1366	1279 a
33,800	1211	1317	1264 a
Pr > F .0009	1202 b	1342 a	

Table 6. Partial budget production costs for conventional and skip-row planted cotton, Texas Upper Gulf Coast, 2003.

	Conventional	Skip row	
Yield (lint pounds/acre)	1342	1201	
Turnout	36.99%	35.89%	
Seed cotton yield (lbs per acre)	3628	3346	
Cotton seed yield (lbs per acre)	2147	1922	
Lint value per acre at loan	$693.81	$620.92	$72.89
Cotton seed value per acre @ $90/ton	$96.62	$86.49	$10.13
Seed cost ($ per acre)	$14.39	$9.57	($4.82)
Technology fee ($ per acre)	$13.49	$8.97	($4.52)
In furrow insecticide cots ($ per acre)	$9.90	$6.60	($3.30)
banded herbicide cost ($ per acre)	$8.09	$5.39	($2.70)
Calculated picking charge ($ per acre)	$64.15	$46.74	($17.41)
Ginning cost per acre	$120.78	$108.09	($12.69)
Advantage for conventional per acre			37.58

SUSCEPTIBILITY OF THE BOLLWORM TO PYRETHROID INSECTICIDE IN THE TEXAS COASTAL BEND

Texas Agricultural Experiment Station, Nueces County, 2003

Roy D. Parker
Extension Entomologist
Corpus Christi, Texas

SUMMARY: During the 2003 cotton growing season it became more difficult to obtain a high level of bollworm control with low to moderate rates of pyrethroid insecticides than experienced in previous years. Part of the problem may have related to greater numbers of larvae over a long sustained period. However, preliminary results of moths collected in Nueces County in 2003 and exposed to pyrethroid insecticide in treated vials showed them to have a higher tolerance to the insecticide than those from 8 other Texas counties. The increased tolerance may have resulted from widespread use of pyrethroid insecticide on sorghum to control various insect pests earlier in 2003. Based on experience in other areas, this tolerance probably will not to carry into the 2004 season. Pest managers should be vigilant in watching for signs of more difficulty in killing high percentages of bollworm larvae in future years.

OBJECTIVE: Pyrethroids are critical components in current strategies to effectively manage the bollworm on cotton. The objective of the vial testing of moths was to monitor insecticide susceptibility in field-collected populations of cotton bollworm.

MATERIALS/METHODS: Moths collected early each morning from wire cone Hartstack traps baited with pheromone lures were fed a 10% sugarwater solution for 15 to 50 minutes. Following this resting period, one moth each was placed into insecticide coated 20 ml glass scintillation vials and held 24 hours for evaluation. Moths were exposed to cypermethrin concentrations of 0, 0.3, 1, 3, 5, 10, and 30 micrograms per vial. Vials were placed in a rack and held at room temperature (74-75°F) at a 45° angle with caps loosened. After 24 hours, moths in each vial were inspected and judged to be alive (able to fly), down but not dead, or dead. These data were recorded and sent the Toxicology Laboratory, Department of Entomology, Texas A&M University, College Station, Texas for further analysis.

Large numbers of moths were not captured in pheromone traps and only 65 moths were tested at each concentration during July and August. This limited testing may not have provided an exact assessment of moth susceptibility, but results should serve as a starting point for additional evaluation in 2004.

RESULTS/DISCUSSION: Mortality of moths and resulting probit analysis from 9 Texas counties is shown in Fig. 1. Lines more to the right in the figure indicate lower mortality rates. It is evident that Nueces County moths were more difficult to kill during July and August of 2003, but it does not indicate what the situation will be in 2004. With population mixing from other host plants and areas it would not be surprising for the bollworm to become less tolerant in 2004.

Increased tolerance of the bollworm to pyrethroid insecticides by July of 2003 may have been the result of increased and widespread use of the insecticide on sorghum in the region earlier in the 2003 season.

ACKNOWLEDGMENTS: Appreciation is expressed to Dr. Patricia Pietrantonio and to Terry Junek, Department of Entomology, Texas A&M University, College Station, Texas for their support of this project. They provided all the materials necessary to carry out the vial study and processed the data for presentation. Dr. Pietrantonio is the leader for this project for the state of Texas.

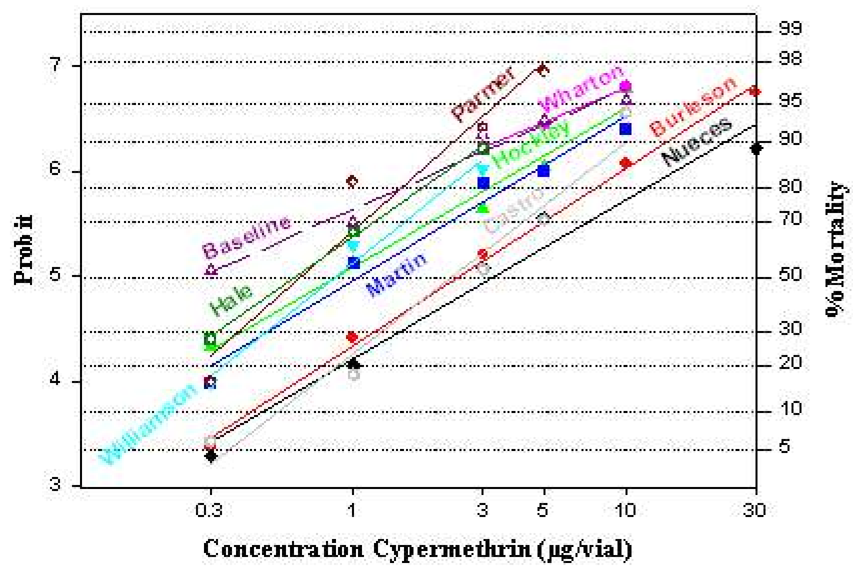

Figure 1. Cypermethrin Mortality by Texas County, Linear Regression

SUSCEPTIBILITY STATUS OF BOLL WEEVILS FROM VICTORIA COUNTY TO ULV MALATHION: A PRELIMINARY REPORT

Victoria County, 2003

Patricia V. Pietrantonio, Roy D. Parker, and Terry A. Junek
Associate Professor, Extension Entomologist, and Technician I, respectively
College Station, Corpus Christi, and College Station, Texas

SUMMARY: Boll weevils collected in Victoria County in 2003 were not found to be more tolerant to ULV malathion compared with individuals tested in 2000 from Nueces County. Numerically LC50 and LC95 values and resistance ratios were lower than found for boll weevils tested in 2000.

OBJECTIVE: The study was initiated to compare the susceptibility to ULV malathion of boll weevils reared from cotton squares collected within the geographic area of the South Texas/Winter Garden Boll Weevil Eradication Zone during the 2003 growing season with those tested from Nueces County in 2000.

MATERIALS/METHODS: Approximately 800 cotton squares showing signs of boll weevil egg laying punctures were collected on October 20, 2003 from a cotton field in Victoria County. This field had been treated numerous times during the season with ULV malathion, and the area has been in an eradication program since 1998 (first full season treatments). Squares were shipped to the Insect Toxicology Laboratory, Texas A&M University, College Station, Texas to obtain adults for testing. Infested squares were stored for seven days, then manually opened to remove pupae. Pupae were placed in plastic ventilated 150 mm petri dishes on damp vermiculate and kept at 27°C until adults emerged. Adults were then removed each day and placed in cages where they were fed fresh organic apple. Two to three day old adult boll weevils were used for tests.

Treated vials containing boll weevil adults were kept in an insect incubator at 16L:8D photoperiodic cycle and at 27°C. Mortality was recorded at 48 hours; values were corrected for control mortality with the Abbott's formula. Numbers of live, knocked-down and dead weevils were recorded. Weevils that could stand up on their own were recorded as alive. Weevils that could not stand up but responded to a pinch on the snout were recorded as knocked down. All others were recorded as dead. Mortality values included numbers of dead and knocked down weevils. Resistance ratios were calculated both for LC50 and LC95.

RESULTS/DISCUSSION: LC50 and LC95 (lethal concentration to kill 50% and 95% of individuals tested) values for boll weevils collected in Nueces County in 2000 and in Victoria County in 2003 are provided in Table 1. In 2000, Nueces County had been under boll weevil eradication for nearly three full seasons; whereas, in 2003, Victoria County had been in the program for six full seasons.

There has not been an increase in tolerance by the boll weevil to ULV malathion during the period according to this data. Concentrations for the LC50 and LC95 values and resistance ratios are actually numerically lower than 2000 data indicated. This finding is important since boll weevils have been exposed to ULV malathion in Victoria County for 6 full seasons plus the fall diapause programs in 1996 and 1997. It should be noted that at least some of the previous generations of the boll weevils tested from Victoria County were most likely from outside the South Texas/Winter Garden Boll Weevil Eradication Zone. They were collected within 16 miles of Jackson County which did not enter into boll weevil eradication until late season 2002.

ACKNOWLEDGMENTS: Thanks are extended to Bill Obsta, Victoria County producer, for calling our attention to the boll weevil infestation. Harold Tannihill, Texas Boll Weevil Eradication Foundation, is acknowledged for his assistance in collecting boll weevil infested cotton squares.

Table 1. Comparison of boll weevils for susceptibility to ULV malathion after a 48-hour exposure period, Coastal Bend of Texas.

Weevil collection year[a]	LC50 ug/vial	LC50 resistance ratio	LC95 ug/vial	LC95 resistance ratio
2000	4.97	2.55	43.64	5.35
2003	2.83	1.45	9.32	1.14

[a] Boll weevils collected in Nueces County (2000) and Victoria County (2003).

2003 LOWER GULF COAST REGIONAL CORN HYBRID PERFORMANCE TEST, CONDUCTED BY TEXAS COOPERATIVE EXTENSION, D-11 AND D-12 , CORPUS CHRISTI, TEXAS

PARTICIPATING SEED COMPANIES AND HYBRIDS ENTERED IN 2003:

AgriPro Seed Co: AP 9646
Asgrow Seed Co: RX 897RR
BH Genetics: BH 8822RR
Croplan Genetics: 818 RR/BT
DeKalb Genetics Corp: DKC 69-60
Garst Seed Co: 8230IT
G.E. Warner: W-4700R
Golden Acres Genetics: GA 2868IMI
NC+ Hybrid Co: NC+ 7237
Pioneer Hi-Bred Int'l: 31G66
Triumph Seed Co, Inc: 2011RR
UAP DynaGro: DG 57K66

LOCATION COOPERATORS

COUNTY	TOWN	AGENT	PRODUCER
DeWitt	Cuero	Anthony Netardus	Fred & Chad Hahn
Nueces	Robstown	Harvey Buehring	TAMU-CC
Refugio	Refugio	Mike Mauldin	Venture Farms
San Patricio	Sinton	Jeff Stapper	Ring Brother Farm

2003 Lower Gulf Coast Regional Corn Hybrid Performance Test, Texas Cooperative Extension, D-11 and 12, Corpus Christi, Texas

Hybrid	San Pat[A] Ring Bros	Nueces[R] TAM-CC	DeWitt Hahn	Refugio Venture	Average
T 2011RR	112	55	35	25	57
AP 9646	112	58	37	19	56
RX 897RR	109	47	47	22	56
NC+ 7237	113	46	37	24	55
W-4700R	109	44	41	23	54
GA 2868IMI	109	40	43	12	51
DG 57K66	111	39	36	17	51
BH 8822RR	105	43	33	17	50
818 RR/BT	111	33	41	12	49
Garst 8230IT	112	42	27	13	48
DKC 69-70	103	43	26	18	47
31G66	96	37	34	23	47
Average	108	44	36	19	52

(1) All data adjusted to 15% moisture. All locations were machine harvested strip tests.

(2) -- Denotes lost data or an unplanted hybrid. To avoid unfair weighting by location, the mean location average has been used in summarizing regional yields of individual hybrids. Locations with an A denote accuracy testing was used. Locations with an R denotes replicated plots.

(3) Plot locations in Bee, Goliad and Karnes Counties lost due to Hurricane Claudette. Wilson County test lost due to severe drought. No corn test was established in Aransas, Jim Wells, Kleberg, or Lavaca Counties due to low corn acreage.

(4) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with County Extension Agents in Coastal Bend Extension Districts 9, 11 and 12. Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412, (361) 265-9203.

(5) It generally requires 10 bu/ac change in yield for one hybrid to be statistically different from another.

(6) Late arrivals of seed/miscommunications affected the presence of some entries in these tests.

2003 UPPER GULF COAST REGIONAL CORN HYBRID PERFORMANCE TEST, CONDUCTED BY TEXAS COOPERATIVE EXTENSION, D-10 AND 11, CORPUS CHRISTI, TEXAS

PARTICIPATING SEED COMPANIES AND HYBRIDS ENTERED IN 2003:

AgriPro Seed Co: AP 9646
Asgrow Seed Co: RX897RR
BH Genetics: BH 9012
Croplan Genetics: 818RRBt
DeKalb Genetics Corp: DKC 67-70
Garst Seed Co: 8255RR
G. E. Warner: W4700R
Golden Acres Genetics: 2850RR
NC+ Hybrid Co: NC+ 7237
Pioneer Int'l: 31G66
Triumph Seed Co, Inc: 1866Bt, 2010RR

LOCATION COOPERATORS

COUNTY	TOWN	AGENT	PRODUCER
Brazoria	Angleton	Wayne Thompson	Texas Department of Corrections- Darrington Unit
Colorado	Columbus	Benard Mitchell	Leopold Brothers Farm
Fort Bend	Rosenberg	Glenn Avriett	Texas Department of Corrections- Jester Unit
Jackson	Edna	Chris Schneider	Dave Allen Farms
Victoria	Victoria	Joe Janak	Adamek Farms
Wharton	Wharton	Rick Jahn	Larry Kalina

2003 Upper Gulf Coast Regional Corn Hybrid Performance Test, Texas Cooperative Extension, D-10 and 11, Corpus Christi, Texas

Hybrid	Colorado Leopold	Fort Bend TDC	Victoria Adamek	Wharton[R] Kalina	Average
1866Bt	125	--	71	111	93
NC+ 7237	116	68	64	103	88
BH 9012	119	61	48	120	87
818RRBt	126	--	53	101	86
31G66	101	71	55	110	84
GA 2850RR	103	66	47	117	83
AP 9646	100	68	60	104	83
2010RR	--	--	47	--	82
RX 897RR	95	--	50	121	82
W4700R	99	60	53	113	81
DKC 67-70	109	50	40	106	76
8255RR	100	61	46	97	76
Average	108	63	53	109	83

(1) All data adjusted to 15% moisture. All locations were machine harvested strip tests.

(2) - - denotes lost data or unplanted hybrid. To avoid unfair weighting by location, the mean location average has been used in summarizing regional yields of individual hybrids. Locations with an (A) denote that accuracy testing was used. (R) indicates replicated plots.

(3) Corn plots were not established in Austin, Fayette, Lavaca, Matagorda and Washington Counties. Corn lost in Calhoun County due to Hurricane Claudette. TDC-Darrington had too few hybrids to enter (31G66 = 68, BH9012 = 93, NC+7237 = 86, 1866Bt = 107). Dale Allen test lost in Jackson County due to drought and very poor stands (poor emergence).

(4) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with County Extension Agents in Coastal Bend Extension Districts 9, 10 and 11, Texas A&M Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. 361-265-9203.

(5) It generally requires 10 bu/ac change in yield for one hybrids to be statistically different from another.

(6) Late arrivals of seed/mis-communications affected the presence of some entries in this test.

2003 LOWER GULF COAST STANDARD GRAIN SORGHUM HYBRID TEST, CONDUCTED BY TEXAS COOPERATIVE EXTENSION D-11, CORPUS CHRISTI, TEXAS

PARTICIPATING SEED COMPANIES AND HYBRIDS ENTERED IN 2003:

Asgrow Seed Co: A571
BH Genetics: BH 5662
Croplan Genetics: 614
DEKALB: DKS 36-00
Garst Seed Co: 5382
George Warner Seed Co: W851DR
Golden Acres Genetics: X-2027
NC+ Hybrid Co: NC+ 7R83
Pioneer Hi-Bred Int'l: 84G62
Sorghum Partners, Inc: NK 7633
Triumph Seed Co, Inc: TR 465
UAP Dyna-Gro: DG732B

LOCATION COOPERATORS

COUNTY	TOWN	AGENT	PRODUCER
DeWitt	Cuero	Anthony Netardus	Respondek Farm
Jim Wells	Alice	Rogelio Mercado	Nock Farms
Karnes	Karnes City	Dennis Hale	Terry Tam Farm
Kleberg	Kingsville	John Ford	Cumberland Farm
Nueces	Robstown	Harvey Buehring	McNair Farms Ordner Farms Perry Foundation TAMU-CC
Refugio	Refugio	Mike Mauldin	Lenhart Brothers Tommy Zabel Farm
San Patricio	Sinton	Jeff Stapper	TAES-Hunt Schneider Farm
Wilson	Floresville	Charles Pfluger	Ortman Farm

2003 Lower Gulf Coast Standard Grain Sorghum Hybrid Test, Texas Cooperative Extension, Coastal Bend District 11

Hybrids	Bee Gaitian	DeWitt Respondek[AT]	Jim Wells Nock	Kleberg Cumberland	Nueces Tam-CC[R]	Nueces Perry[AT]	Nueces McNair[AT]	Nueces Ordner[AT]	Refugio Zabel	San Pat Hunt	San Pat Schneider[AT]	Wilson Ortman	Average
7R83	2942	3209	4132	4048	2634	3553	5238	5365	2215	4599	6155	2101	3849
84G62	3158	3678	3148	3075	2140	4101	5193	5634	1674	4799	6560	2207	3781
DKS 36-00	3115	2550	3509	3912	2586	4271	4613	5154	3751	4314	--	1456	3771
W851DR	2782	--	3255	--	3231	3850	5205	5573	2691	4030	6259	1687	3757
X2027	2669	4040	3268	3539	2445	--	4747	5526	2592	4029	6403	1945	3742
A571	2849	3613	2897	3391	2883	--	4683	5353	2795	4670	6155	1602	3716
614	--	2710	--	--	3083	3414	4660	5595	--	--	6492	--	3658
TR465	2967	2903	2934	--	2604	--	4535	5241	3613	3984	6199	1456	3633
NK 7633	3440	2546	3207	2840	2946	3594	5201	5634	3095	3905	4751	1426	3549
DG732B	3177	2406	3400	3449	2768	3647	3632	4810	3401	3636	--	1266	3467
5382	2923	2924	2604	3462	2107	3130	4483	5092	1469	3170	5636	2436	3286
BH 5662	1940	3075	2254	--	2366	--	3980	4318	1908	2738	5538	1979	3105
Average	2906	3059	3146	3465	2649	3695	4681	5275	2655	3989	6015	1778	3610

(1) All data adjusted to 14% moisture. All locations were machine or hand harvested strip tests. TAM-CC and San Patricio (Hunt), which were replicated in a randomized block design.

(2) -- denotes lost data or unplanted hybrid. To avoid unfair weighting by location, the mean location average has been used in summarizing regional yields of individual hybrids. Locations with an *AT* denotes accuracy testing, *R* denotes replication.

(3) No standard plots were planted in Brooks, Fayette, Goliad, Gonzales, Lavaca, and Live Oak Counties, due to low row crop acreages or use of local testing arrangements. Test damaged in Wilson County due to severe drought. Test lost in Refugio County (Lenhart) & Karnes (Tam) from Hurricane Claudette.

(4) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with County Extension Agents in Coastal Bend Extension Districts 10, 11, and 12, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX, 78406-1412, Ph-361/265-9203.

(5) It generally requires 350-500 lbs/ac change in yield for one hybrid to be statistically different from another.

(6) Late arrivals of seed/mis-communications affected presence of some entries in this test. Some seed entries arrived too late to be planted in the majority of locations. See individual county tests for add-on hybrids.

2003 UPPER GULF COAST STANDARD GRAIN SORGHUM HYBRID TEST
CONDUCTED BY
TEXAS COOPERATIVE EXTENSION
D-11, CORPUS CHRISTI, TEXAS

PARTICIPATING SEED COMPANIES AND HYBRIDS ENTERED IN 2003:

Asgrow Seed Co: A571
B-H Genetics: BH 5662
Croplan Genetics: 614
DEKALB: DKS 54-00
Garst Seed Co: 5382
George Warner Seed Co: W851DR
Golden Acres Genetics: X-2027
NC+ Hybrid Co: 8R18
Pioneer Hi-Bred Int'l: 83G88
Sorghum Partners Inc: K73-J6
Triumph Seed Co: 82G
UAP DynaGro: DG762B

LOCATION COOPERATORS

COUNTY	TOWN	AGENT	PRODUCER
Brazoria	Angleton	Wayne Thompson	Texas Department of Corrections- Darrington Unit
Calhoun	Port Lavaca	Zan Matthias	Jimmy Hays Farm
Fort Bend	Rosenberg	R. Glenn Avriett	Texas Department of Corrections- Jester Unit
Jackson	Edna	Chris Schneider	Kenneth Rasmusson Farm
Matagorda	Bay City	Brent Batchelor	Brent & Lisa Batchelder
Victoria	Victoria	Joe Janak, Jr.	Duane Kainer Farm
Wharton	Wharton	Rich Jahn	Elvin Berndt Farm

27th YEAR

2003 Upper Gulf Coast Standard Grain Sorghum Performance Test, Texas Cooperative Extension, Coastal Bend District 11

Hybrids	Jackson Rasmussen[AT]	Matagorda Batchelder[AT]	Victoria Kainer[AT]	Average
8R18	4963	4900	4793	4885
A571	4720	4985	4759	4821
DKS 54-00	5242	4721	4459	4807
5382	5087	4704	4550	4780
BH 5662	5084	4548	4268	4633
W851DR	5051	4412	4383	4615
83G88	4709	4600	4470	4593
82G	4709	4879	4135	4574
X-2027	4949	4672	4041	4554
K73-J6	4551	4475	4631	4552
DG762B	4420	4370	4514	4435
Average	4862	4661	4455	4659

(1) All data adjusted to 14% moisture. All locations were machine harvested strip tests.

(2) - - denotes lost data or unplanted hybrid. To avoid unfair weighting by location, the mean location average has been used in summarizing regional yields of individual hybrids. Locations with an "AT" denotes that accuracy testing was used. "R" indicates replicated plots.

(3) Calhoun County test (Hays) was lost due to Hurricane Claudette. Brazoria County (TDC), Fort Bend County (TDC) and Wharton County (Berndt) were damaged and were harvested without data collection. No standard plots were planted in Austin, Colorado, Fayette, Galveston, or Washington Counties because of low sorghum acreage.

(4) Data was compiled by Steve Livingston, Agronomy Specialist, in cooperation with County Extension Agents in Coastal Bend Extension Districts 9, 10 and 11, Texas A&M University Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. Ph-361/265-9203.

(5) It generally requires 350-500 lbs/ac change in yield for one hybrid to be statistically different from another.

(6) Late arrivals of seed/mis-communications may have affected the presence of some entries at individual test locations.

Texas Cooperative EXTENSION The Texas A&M University System

Productive Rotations on Farms in Texas PROFIT

2003 LOWER GULF COAST REGIONAL COTTON VARIETY PERFORMANCE TEST, CONDUCTED BY TEXAS COOPERATIVE EXTENSION, D-11 AND D-12, CORPUS CHRISTI, TEXAS

PARTICIPATING SEED COMPANIES AND VARIETIES ENTERED IN 2003:

Bayer Crop Science: FM 800BR, FM832, FM 958B, FM 960BR, FM 989BR, FM 991BR

Delta & Pine Land: Delta PEARL, DPL 444 BG/RR, DPL 449 BG/RR, DPL 451 BG/RR, DPL 491, DPL 555 BG/RR

Stoneville Seed Co: ST 5303R, ST 5599BR

Beltwide Cotton Genetics: BCG 24R, BCG 28R, BCG 30R, BCG 245, BCG 295

LOCATION COOPERATORS

County	Town	Agent	Producer
Jim Wells	Alice	Rogelio Mercado	David Hoelscher Farms
Kleberg	Kingsville	John Ford	Jeff Yaklin Farms
Nueces	Robstown	Harvey Buehring	Jungman Farms Morris Farms Prince Farms TAM Meaney Annex
Refugio	Refugio	Mike Mauldin	Jimmy Rathkamp Venture Farms
San Patricio	Sinton	Jeff Stapper	Chopelas Farms Hoskinson Farms Rieder Farms

2003 Lower Gulf Coast Regional Cotton Variety Performance Test, Texas Cooperative Extension, D-11 and D-12, Corpus Christi, Texas

Variety	Kleberg Yaklin	Jim Wells[A] Hoelshcer	Nueces[A] Jungman	Nueces[A] Morris	Nueces[A] Prince	Nueces[R] TAM-CC	Refugio Venture	San Pat[R] Chopelas	San Pat[A] Hoskinson	San Pat[A] Rieder	Average
ST 5599BR	1118	1151	1050	1047	1671	1526	1215	1626	1112	1331	1285
FM 800BR	1320	965	985	1089	1633	1426	1080	1478	1159	1165	1230
DPL 491	1067	1015	1037	1110	1448	1492	--	1435	1083	1213	1193
DPL 555 BG/RR	1175	917	1050	930	1323	1575	1190	1544	1069	1053	1183
FM 960BR	1272	804	990	911	1353	1486	1100	1466	1095	1205	1168
FM 958B	--	802	--	1092	1433	1323	--	1684	--	1198	1166
FM 989BR	1078	941	974	958	1343	1466	1070	1461	1073	1132	1150
DPL 449 BG/RR	1203	916	1100	924	1300	1509	1021	1300	1042	1140	1146
DPL 444 BG/RR	817	1114	1096	924	1300	1385	1061	--	--	--	1130
FM 991BR	810	1089	1041	905	1382	1451	1056	1493	1071	949	1125
Delta PEARL	902	1144	960	949	1303	1409	--	1577	937	1035	1124
FM 832	--	1022	--	927	1229	1360	--	--	--	--	1124
DPL 451 BG/RR	1165	799	904	928	1315	1342	--	1517	1037	1148	1118
BCG 245	--	1070	984	956	1324	1286	--	1308	973	1146	1115
BCG 28R	--	1030	907	985	1301	1197	939	1469	978	1109	1099
ST 5303R	1016	1069	881	952	1311	1399	888	1333	939	1055	1084
BCG 24R	--	996	919	910	1274	1313	908	1330	1009	1103	1084
BCG 295	--	933	926	895	1021	1263	--	1288	888	1086	1041
BCG 30R	--	816	1036	909	1248	1164	811	1325	931	1058	1038
Average	1079	979	991	963	1343	1388	1028	1449	1025	1125	1137

(1) Spaces indicated by -- reflect loss of data or the variety was not included at that location. Location averages were used as artificial data to avoid weighting by location.

(2) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with Extension Agents in Coastal Bend Extension Districts 11 and 12, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX, 78406-1412.

(3) All locations were machine harvested except the Yaklin and Hoelscher plots, which were hand harvested. Jungman, Morris and Prince locations were stripper harvested. Locations with an (R) denotes replication was used. Locations with an (A) denotes accuracy testing was used.

(4) Standardized cotton variety performance tests were not conducted in Bee, DeWitt, Goliad, or Karnes Counties.

Table 1. Micronaire values for 19 commercial cotton varieties, 2003 Lower Gulf Coast Regional Cotton Variety Performance Test, Texas Cooperative Extension, D-11 and 12, Corpus Christi, Texas

Variety	Kleberg Yaklin	Jim Wells Hoelscher	Nueces Jungman	Nueces Morris	Nueces Prince	Nueces TAM-CC	Refugio Venture	San Pat Chopelas	San Pat Hoskinson	San Pat Rieder	Average
DPL 451 BG/RR	4.7	4.9	5.4	4.9	5.4	4.6	--	4.4	5.2	5.2	4.9
BCG 28R	--	4.8	5.3	5.1	5.5	4.6	4.9	4.2	5.0	5.2	4.9
ST 5599BR	4.6	4.6	5.1	5.1	5.0	4.5	4.6	4.0	5.0	5.4	4.8
Delta PEARL	4.7	4.4	5.2	5.0	4.9	5.0	--	4.2	5.2	5.2	4.8
ST 5303R	4.4	4.7	5.0	5.0	5.0	4.8	4.3	4.3	5.0	5.0	4.8
DPL 555 BG/RR	4.5	4.6	5.1	4.7	4.7	5.1	4.5	4.4	4.8	4.9	4.7
DPL 449 BG/RR	4.3	4.5	5.3	4.6	4.9	5.2	4.4	4.1	5.0	4.8	4.7
FM 991BR	3.9	4.5	4.9	4.6	4.9	4.7	4.6	4.3	4.8	5.0	4.6
FM 960BR	4.0	4.3	4.9	4.7	4.9	5.1	4.4	4.2	4.7	4.8	4.6
BCG 24R	--	4.4	5.1	4.6	4.9	4.4	4.5	3.8	5.0	5.1	4.6
FM 958B	--	4.3	--	4.5	4.7	4.9	--	--	--	--	4.5
FM 989BR	3.9	4.3	5.0	4.6	4.9	4.7	4.4	4.0	4.8	4.8	4.5
DPL 491	4.2	4.2	5.0	4.8	4.9	5.1	--	3.8	4.7	4.6	4.5
BCG 295	--	4.5	5.0	4.8	4.7	4.5	--	3.9	4.7	5.0	4.5
FM 832	--	4.2	--	4.5	4.3	4.6	--	--	--	--	4.5
BCG 30R	--	4.6	4.4	4.5	4.7	4.6	4.2	3.8	4.5	4.9	4.4
DPL 444 BG/RR	3.8	4.1	4.4	4.1	4.5	4.6	4.1	--	--	--	4.4
BCG 245	--	4.2	4.5	4.3	4.4	4.8	--	3.6	4.2	4.6	4.3
FM 800BR	3.6	4.1	4.4	4.5	4.5	4.4	4.0	3.6	4.4	4.5	4.2
Average	4.2	4.4	4.9	4.7	4.8	4.7	4.4	4.0	4.8	4.9	4.6

Table 2. Fiber strength values for 19 commercial cotton varieties, 2003 Lower Gulf Coast Regional Cotton Variety Performance Test, Texas Cooperative Extension, D-11 and 12, Corpus Christi, Texas

Variety	Kleberg Yaklin	Jim Wells Hoelscher	Nueces Jungman	Nueces Morris	Nueces Prince	Nueces TAM-CC	Refugio Venture	San Pat Chopelas	San Pat Hoskinson	San Pat Rieder	Average
FM 960BR	33.7	36.1	32.7	30.4	31.5	35.5	32.5	32.8	35.1	34.2	33.5
BCG 245	--	36.8	32.0	33.3	34.7	31.1	--	33.4	35.0	33.5	33.3
FM 991BR	34.2	36.0	31.2	30.5	32.3	33.0	31.4	33.2	34.9	34.6	33.1
ST 5303R	33.2	35.0	31.5	29.3	31.6	33.6	34.3	32.4	33.1	31.7	32.6
FM 800BR	34.3	34.4	31.6	30.8	33.2	27.7	32.5	31.6	34.1	34.2	32.4
FM 832	--	35.6	--	31.0	37.4	30.2	--	--	--	--	32.2
DPL 491	34.1	32.5	29.5	28.8	31.8	34.7	--	33.7	32.7	32.5	32.1
FM 958B	--	36.1	--	31.2	31.7	31.1	--	--	--	--	31.8
DPL 449 BG/RR	32.5	32.4	28.9	30.2	31.5	31.9	31.9	31.4	32.0	33.0	31.6
FM 989BR	31.7	33.9	30.8	29.4	31.2	33.3	28.2	30.6	32.4	31.8	31.3
BCG 295	--	33.1	29.5	28.1	30.1	34.6	--	31.5	31.4	30.5	31.2
Delta PEARL	32.4	32.9	29.3	28.0	30.7	32.3	--	30.6	31.2	31.2	30.9
ST 5599BR	31.5	32.0	30.1	27.2	28.2	33.6	30.1	30.4	32.0	30.2	30.5
BCG 30R	--	31.1	28.7	28.4	29.5	31.5	29.5	33.2	30.4	29.6	30.4
DPL 444 BG/RR	28.2	29.6	27.2	26.7	29.7	37.2	29.1	--	--	--	30.3
BCG 24R	--	31.1	28.1	27.8	28.3	31.7	30.5	29.8	30.0	29.8	29.9
BCG 28R	--	31.6	28.1	26.4	26.5	34.9	30.6	28.9	29.0	29.9	29.8
DPL 555 BG/RR	29.9	30.9	28.0	26.0	30.5	33.9	28.2	29.0	30.4	30.4	29.7
DPL 451 BG/RR	29.2	27.9	27.6	27.0	27.2	34.8	--	29.0	29.2	29.9	29.3
Average	32.1	33.1	29.7	29.0	30.9	33.0	30.7	29.7	32.1	31.7	31.2

Table 3. Fiber length values for 19 cotton varieties, 2003 Lower Gulf Coast Regional Cotton Variety Performance Test, Texas Cooperative Extension, D-11 and 12, Corpus Christi, Texas

Variety	Kleberg Yaklin	Jim Wells Hoelshcer	Nueces Jungman	Nueces Morris	Nueces Prince	Nueces TAM-CC	Refugio Venture	San Pat Chopelas	San Pat Hoskinson	San Pat Rieder	Average
FM 800BR	1.18	1.18	1.11	1.11	1.18	1.13	1.23	1.21	1.20	1.22	1.18
BCG 245	--	1.17	1.09	1.07	1.16	1.17	--	1.20	1.18	1.16	1.14
DPL 491	1.19	1.18	1.06	1.04	1.15	1.12	--	1.18	1.18	1.16	1.14
FM 832	--	1.18	--	1.09	1.23	1.16	--	--	--	--	1.14
BCG 295	--	1.16	1.12	1.03	1.13	1.21	--	1.14	1.16	1.14	1.13
DPL 444 BG/RR	1.07	1.12	1.05	1.06	1.13	1.20	1.12	--	--	--	1.12
BCG 30R	--	1.13	1.07	1.04	1.12	1.10	1.14	1.16	1.15	1.14	1.12
DPL 451 BG/RR	1.12	1.13	1.06	1.03	1.09	1.18	--	1.14	1.10	1.14	1.11
Delta PEARL	1.06	1.15	1.06	1.02	1.09	1.15	--	1.14	1.15	1.15	1.11
FM 958B	--	1.16	--	1.04	1.05	1.13	--	--	--	--	1.11
BCG 28R	--	1.12	1.04	1.01	1.07	1.19	1.16	1.12	1.13	1.12	1.11
FM 989 BR	1.14	1.13	1.05	1.05	1.10	1.14	1.11	1.10	1.13	1.11	1.11
FM 991 BR	1.06	1.15	1.04	1.03	1.09	1.13	1.13	1.14	1.14	1.14	1.11
FM 960BR	1.08	1.10	1.08	1.01	1.07	1.15	1.14	1.11	1.14	1.12	1.10
ST 5599BR	1.08	1.10	1.07	1.01	1.08	1.18	1.14	1.12	1.10	1.09	1.10
ST 5303R	1.08	1.11	1.02	1.00	1.06	1.18	1.15	1.10	1.09	1.09	1.09
DPL 449 BG/RR	1.06	1.15	1.01	1.01	1.07	1.10	1.14	1.11	1.12	1.11	1.09
BCG 24R	--	1.08	1.02	1.00	1.08	1.16	1.11	1.12	1.10	1.06	1.08
DPL 555 BG/RR	1.09	1.08	1.00	0.98	1.08	1.12	1.13	1.08	1.09	1.10	1.08
Average	1.10	1.14	1.06	1.03	1.11	1.15	1.14	1.14	1.14	1.13	1.09

2003 UPPER GULF COAST REGIONAL COTTON VARIETY PERFORMANCE TEST, CONDUCTED BY TEXAS COOPERATIVE EXTENSION, D-10 AND D-11, CORPUS CHRISTI, TEXAS

PARTICIPATING SEED COMPANIES AND VARIETIES ENTERED IN 2003:

Bayer Crop Science: FM 800 BR, FM832, FM 960RR, FM 966, FM 989R, FM 991BR

Beltwide Cotton Genetics: BCG 24R, BCG 28R, BCG 30R, BCG 245, BCG 295

Delta & Pine Land: Delta PEARL, DP 444 BG/RR, DP 449 BG/RR, DP 451 BG/RR, DP491, DP 493, DP 555 BG/RR, SG 215 BG/RR

Stoneville Seed Co: BXN 49B, ST 5303R, ST 5599BR

LOCATION COOPERATORS

County	**Town**	**Agent**	**Producer**
Calhoun	Port Lavaca	Zan Matthies	Danny May Farms
Wharton	Wharton	Rick Jahn	WCYF-Wharton County Youth Fair
Matagorda	Bay City	Brent Batchelor	Batchelder Farms
Fort Bend	Rosenberg	Glen Avriett	Allen Stasney

Upper Gulf Coast Cotton Variety Performance Test, Texas Cooperative Extension, D-10 and D-11 Cooperating, 2003

Variety	Calhoun* May	Fort Bend Stasney	Matagorda Batchelder	Wharton WCYF	Average
ST 5599BR	916	680	787	1120	876
DP 555 BG/RR	810	803	758	1077	862
FM 960RR	911	669	816	989	846
FM 800BR	926	590	766	865	787
SG 215BR	893	572	--	932	773
FM 991BR	741	833	649	848	768
DP 444 BG/RR	987	485	709	--	763
ST 5303R	887	429	549	754	730
FM 989R	847	574	--	761	719
DP 451 BG/RR	-*-	661	--	815	717
BCG 28R	832	424	804	790	713
Delta PEARL	823	402	596	1028	712
DP 493	-*-	370	--	1050	703
DP 449 BG/RR	485	648	691	902	683
BXN 49B	648	426	785	854	678
DP 491	-*-	383	624	935	661
BCG 245	737	335	628	846	637
BCG 295	799	274	650	780	626
FM 966	755	343	547	845	623
FM 832	463	305	790	790	587
BCG 30R	589	423	624	663	575
BCG 24R	479	371	--	676	555
Average	700	500	693	872	755

(1) Spaces indicated by -- reflect loss of data or the variety was not included at that location. Location averages were used as artificial data to avoid weighting by location.

(2) Tests were not established in Victoria or Dewitt counties. Plots were lost in Brazoria County due to prolonged wet weather. Locations with an asterisk (*) denotes accuracy testing was used. Entries with -*- indicate problems with taking proper sample at harvest. Actual values were used in compiling average yield for testing location, but test average used to compute average yields.

(3) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with Extension Agents in Coastal Bend Extension Districts 9 and 11, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. 361-265-9203.

NOTE: There were some reservations about including the Calhoun and Fort Bend locations and even having an UGC Regional test this year due to Hurricane Claudette and delayed harvesting, respectively. Calhoun County was more affected by early season drought than by bad weather. The Fort Bend county location could not be harvested when ready due to rain and wet field conditions (October) and some varieties with open bolls were adversely affected.

Upper Gulf Coast Cotton Variety Performance Test, Texas Cooperative Extension, D-10 and D-11 Cooperating, Strength, 2003

Variety	Calhoun May	Matagorda Batchelder	Wharton WCYF	Average
FM 966	35.6	36.4	34.9	35.6
FM 960RR	34.1	36.1	34.6	34.9
FM 800BR	35.3	33.7	35.2	34.7
BCG 245	31.6	35.3	35.5	34.1
DP 491	33.7	33.5	32.3	33.2
FM 832	29.7	35.1	34.4	33.1
ST 5303R	31.5	33.0	32.1	32.2
FM 989R	33.9	--	30.4	32.2
Delta PEARL	33.1	32.5	30.3	32.0
FM 991BR	29.0	34.7	31.8	31.8
BCG 28R	33.8	30.0	30.1	31.3
DP 493	31.9	--	29.2	31.2
BXN 49B	34.4	28.9	30.0	31.1
ST 5599BR	29.4	32.1	30.5	30.7
BCG 295	30.0	31.9	30.2	30.7
DP 449 BG/RR	30.7	30.0	30.7	30.5
DP 444 BG/RR	30.6	28.7	--	30.1
BCG 30R	33.1	29.6	27.3	30.0
BCG 24R	28.9	--	28.3	29.9
DP 555 BG/RR	31.8	28.6	28.4	29.6
DP 451 BG/RR	27.6	--	28.7	29.6
SG 215BR	26.0	--	26.1	28.2
Average	31.6	32.4	31.0	31.7

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(2) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with Extension Agents in Coastal Bend Extension Districts 9 and 11, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. 361-265-9203.

(3) Tests were not established in Calhoun County. Plots were lost in Brazoria County due to prolonged wet weather. Locations with an asterisk (*) denotes accuracy testing was used.

Upper Gulf Coast Cotton Variety Performance Test, Texas Cooperative Extension, D-10 and D-11 Cooperating, Length, 2003

Variety	Calhoun May	Matagorda Batchelder	Wharton WCYF	Average
FM 800BR	1.22	1.24	1.21	1.22
DP 491	1.21	1.19	1.21	1.20
FM 832	1.11	1.23	1.22	1.19
BCG 245	1.14	1.23	1.15	1.17
BCG 28R	1.22	1.12	1.14	1.16
Delta PEARL	1.15	1.16	1.14	1.15
FM 991BR	1.15	1.14	1.13	1.14
FM 966	1.16	1.14	1.13	1.14
BCG 295	1.09	1.19	1.15	1.14
BXN 49B	1.20	1.12	1.09	1.14
ST 5599BR	1.12	1.14	1.12	1.13
DP 493	1.13	--	1.10	1.13
FM 960RR	1.13	1.13	1.12	1.13
ST 5303R	1.18	1.10	1.11	1.13
FM 989R	1.13	--	1.08	1.12
DP 444 BG/RR	1.11	1.13	--	1.12
BCG 30R	1.13	1.13	1.11	1.12
BCG 24R	1.10	--	1.07	1.11
DP 451 BG/RR	1.09	--	1.09	1.11
DP 449 BG/RR	1.10	1.10	1.09	1.10
SG 215BR	1.07	--	1.05	1.09
DP 555 BG/RR	1.10	1.07	1.10	1.09
Average	1.14	1.15	1.12	1.14

(1) Spaces indicated by -- reflect loss of data or the variety was not included at that location. Location averages were used as artificial data to avoid weighting by location.
(2) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with Extension Agents in Coastal Bend Extension Districts 9 and 11, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. 361-265-9203.
(3) Tests were not established in Calhoun County. Plots were lost in Brazoria County due to prolonged wet weather. Locations with an asterisk (*) denotes accuracy testing was used.

Upper Gulf Coast Cotton Variety Performance Test, Texas Cooperative Extension, D-10 and D-11 Cooperating, Micronaire, 2003

Variety	Calhoun May	Matagorda Batchelder	Wharton WCYF	Average
FM 966	4.1	4.4	4.9	4.5
FM 991BR	4.4	4.3	4.8	4.5
BCG 28R	3.7	4.7	4.9	4.4
DP 555 BG/RR	3.4	4.8	5.0	4.4
ST 5599BR	3.5	4.5	5.3	4.4
DP 491	4.2	4.4	4.7	4.4
SG 215BR	4.0	--	4.9	4.3
DP 451 BG/RR	3.9	--	5.0	4.3
Delta PEARL	3.8	4.5	4.7	4.3
ST 5303R	3.8	3.7	5.0	4.2
DP 493	3.9	--	4.7	4.2
BCG 24R	3.8	--	4.6	4.2
DP 449 BG/RR	3.5	4.1	4.8	4.1
FM 960RR	3.9	3.8	4.7	4.1
BCG 245	4.0	3.9	4.3	4.1
BXN 49B	3.3	3.9	4.8	4.0
FM 989R	3.7	--	4.2	4.0
DP 444 BG/RR	3.6	3.7	--	4.0
FM 832	3.2	--	4.3	3.9
BCG 30R	3.9	3.5	4.3	3.9
FM 800BR	3.6	3.4	4.3	3.8
BCG 295	3.4	3.7	4.4	3.8
Average	3.8	4.1	4.7	4.2

(1) Spaces indicated by -- reflect loss of data or the variety was not included at that location. Location averages were used as artificial data to avoid weighting by location.
(2) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with Extension Agents in Coastal Bend Extension Districts 9 and 11, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. 361-265-9203.
(3) Tests were not established in Calhoun County. Plots were lost in Brazoria County due to prolonged wet weather. Locations with an asterisk (*) denotes accuracy testing was used.

Upper Gulf Coast Cotton Variety Performance Test, Texas Cooperative Extension, D-10 and D-11 Cooperating, Turnout,2003

Variety	Calhoun May	Fort Bend TDC	Matagorda Batchelder	Wharton WCYF	Average
ST 5599BR			41.3	42.7	
FM 960RR			39.0	41.9	
DP 555 BG/RR			44.4	45.1	
DP 444 BG/RR			39.5	-	
FM 800BR			39.9	42.4	
SG 215BR			--	41.0	
Delta PEARL			41.9	43.9	
BCG 28R			41.1	42.9	
FM 989R			-	40.6	
BXN 49B			39.9	41.1	
FM 991BR			38.2	39.9	
BCG 295			38.3	39.9	
BCG 245			37.8	39.7	
ST 5303R			37.6	39.8	
FM 966			41.2	42.7	
DP 449 BG/RR			39.6	40.6	
DP 493			-	46.9	
FM 832			37.0	40.2	
BCG 30R			35.3	38.1	
BCG 24R			-	41.6	
DP 451 BG/RR			-	38.9	
DP 491			42.8	43.8	
Average					

(1) Spaces indicated by -- reflect loss of data or the variety was not included at that location. Location averages were used as artificial data to avoid weighting by location.
(2) Data compiled by Steve Livingston, Agronomy Specialist, in cooperation with Extension Agents in Coastal Bend Extension Districts 9 and 11, Texas A&M University Agricultural Research and Extension Center, 10345 Agnes, Corpus Christi, TX 78406-1412. 361-265-9203.
(3) Tests were not established in Calhoun County. Plots were lost in Brazoria County due to prolonged wet weather. Locations with an asterisk (*) denotes accuracy testing was used.

PROFIT

Productive Rotations on Farms in Texas

12-4-03