TEXAS A&M AGRILIFE EXTENSION






Nueces County

Part 2

2012

RESULTS OF AGRICULTURE DEMONSTRATIONS & APPLIED RESEARCH PROJECTS

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

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TEXAS A&M AGRILIFE EXTENSION

FOREWORD

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

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

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

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

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

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

Jeff Stapper

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

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CORN

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HISTORY OF CORN PRODUTION
NUECES COUNTY 1975-2012

Year	Total Acres Planted	Total Acres Harvested	Bushels /Acre	Total Production (Bushels)
1975	1,600	1,200	28	34,000
1976	900	800	53	42,200
1977	500	400	53	21,000
1978	1,300	1,200	63	75,800
1979	6,000	5,800	71	409,700
1980	8,200	7,700	42	322,000
1981	8,300	8,200	90	735,900
1982	10,200	10,100	60	607,500
1983	6,900	6,500	49	319,400
1984	52,200	50,200	43	2,163,900
1985	42,500	41,600	81	3,355,500
1986	31,500	30,200	73	2,200,000
1987	64,800	63,800	84	5,330,100
1988	69,900	66,400	40	2,656,000
1989	43,400	33,400	32	1,068,800
1990	25,000	21,500	24	517,200
1991	13,200	12,900	70	903,000
1992	20,000	19,500	80	1,560,000
1993	41,400	40,900	96	3,926,400
1994	44,603	44,584	73	3,254,632
1995	52,818	25,548	55	1,405,140
1996	17,334	11,000	22	242,000
1997	18,965	18,695	98	1,862,363
1998	55,000	45,000	40	1,800,000
1999	28,997	28,845	81	1,615,000
2000	29,400	28,000	54	1,497,000
2001	2,500	19,400	57	1,109,000
2002	3,200	25,100	42	1,042,000
2003	1,500	1,300	60	681,000
2004	8,000	7,800	91	708,000
2005	7,700	7,600	51	385,000
2006	3,700	1,700	69	17,000
2007	10,300	10,000	86	855,000
2008	5,500	5,400	41	220,000
2009	9,309	2,312	25	57,800
2010	9,866	9,866	97	957,022
2011	12,400	12,400	58	719,200
2012	3,167	1,529	30	45,870
2013				
2014				
2015				
2016				
2017				
2018				
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Data secured from U.S. Department of Agriculture Statistical Reporting Service and Texas Crop Livestock Reporting Service.

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

SORGHUM

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HISTORY OF SORGHUM PRODUTION
NUECES COUNTY 1961-2012

Year	Total Acres Harvested	CWT /Acre	Total (1000 CWT) Production	Year	Total Acres Harvested	CWT /Acre	Total (1000 CWT) Production
1961	179,000	21.28	3,809	1997	204,606	47.00	9,619
1962	141,000	14.00	1,974	1998	190,832	30.00	5,725
1963	191,000	17.02	3,255	1999	184,306	44.00	8,110
1964	296,400	21.34	4,190	2000	177,200	34.00	6,025
1965	204,200	40.21	8,251	2001	122,600	44.00	5,395
1966	223,000	28.73	6,404	2002	187,000	35.00	6,545
1967	250,000	24.53	6,132	2003	179,800	49.00	8,810
1968	223,800	28.01	6,269	2004	163,500	46.00	7,521
1969	228,700	28.56	6,530	2005	157,300	33.46	5,264
1970	238,900	32.33	7,724	2006	92,400	15.68	1,437
1971	213,900	23.86	5,104	2007	184,000	38.64	7,110
1972	188,200	30.74	5,785	2008	188,900	36.96	6,982
1973	280,000	27.50	7,700	2009	49,800	22.40	1,115
1974	299,900	31.86	9,452	2010	183,430	47.30	8,676
1975	294,400	28.00	8,243	2011	141,867	38.00	5,390
1976	275,000	28.00	7,700	2012	58,292	18.00	1,049
1977	260,000	26.88	6,978	2013			
1978	227,000	27.33	6,204	2014			
1979	240,300	32.24	7,747	2015			
1980	243,000	28.71	6,978	2016			
1981	279,600	37.34	10,440	2017			
1982	270,000	36.43	9,837	2018			
1983	149,000	31.13	4,639	2019			
1984	267,200	31.93	8,532	2020			
1985	189,500	41.23	7,813	2021			
1986	154,400	36.05	5,566	2022			
1987	115,000	41.09	4,725	2023			
1988	114,800	32.18	3,694	2024			
1989	175,700	31.00	5,447	2025			
1990	184,622	26.00	4,987	2026			
1991	177,500	35.00	6,212	2027			
1992	185,000	32.00	5,920	2028			
1993	147,590	44.00	6,418	2029			
1994	155,654	32.00	4,981	2030			
1995	101,805	43.00	4,378	2031			
1996	175,000	17.00	2,975	2032			

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

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

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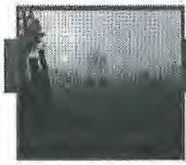

Agriculture and Natural Resources

GRAIN SORGHUM CLUMP PLANTING VS. CONVENTIONAL PLANTING

Texas AgriLife Extension Service
Nueces County

Cooperator: David Ocker

Authors: Jeffrey R. Stapper, County Extension Agent – Ag/NR
J.R. Cantu, Demonstration Assistant-Nueces County

Summary
This test was located on the Ocker Farm south of Corpus Christi off CR 18. Rainfall during the growing season was below normal. There was not a significant difference between the clump vs. conventional planting methods, although there was a numeric difference as the clump sorghum yield was 3,519 pounds per acre while the conventional sorghum yield was 3,557 pounds per acre.

Objective
To evaluate planting of grain sorghum in clumps vs. conventional seed drop method, while at the same time keeping the same plant population per acre.

Materials and Methods
Traditional sorghum seeding plates were altered by closing holes so that seed would be dropped in clumps rather than traditional even spacing. Grain sorghum was planted in clumps (5 to 6 plants per clump, with clumps spaced about 14 inches apart) within rows and conventionally in a randomized complete block design. Seed was planted with a 24-row planter in which half of the planter (12-rows) planted clumps and the other half planted seed the traditional method, with seed spaced uniformly. Seeding rates in both cases was 61,256 seed per acre. Row space was 30-inches.

Table 1: Agronomic data for grain sorghum clump/conventional planting, Ocker Farm, Nueces County, Texas, 2012.

Planting Date: 3/18/2012	**Rows/Plot:** 12 -5 replicates	**Row Width:** 30 inch
Fertility: 235# 22-11-0	**Herbicide:** 13.5 oz/ac Outlook	**Sorghum Hybrid:** Pioneer 84G62
Planting Rate: 61,256 plt/ac	**Soil Type:** Victoria clay	**Previous Crop:** Grain Sorghum
Rainfall: March = 0.65, April = 1.91, May = 2.0, June = 2.0		

Results and Discussion

Plots were machine harvested on July 10, 2012 and weighed with an electronic weigh-wagon. Results from each plot are recorded in Table 2.

Table 2, Comparison of plant population, % moisture, and yield per acre between treatments, Ocker Farm, Nueces County, 2012.

Treatment	Plant Population/Ac	% Moisture	Yield/Acre[1]
Clump	50,312.3 a	14.0	3,519 a
Solid/Conventional	54,956.7 a	14.0	3,557 a
LSD (P=.05)	4,997.22		61.01
CV	2.7		0.49
Grand Mean	52,634.51		3,538.33

[1]Yield per acre is reported in pounds per acre and adjusted to 14% moisture. Means followed by same letter do not significantly differ (P=.05, LSD).

Conclusions

Results from this study suggest that there was not a real difference between treatments (i.e. clump planting vs. conventional planting) as the clump planting average yield was 3,519 pounds per acre, while the yield for the conventional planting was 3,557 pounds per acre. Rainfall during the growing season was below normal.

Acknowledgements

The cooperation and support of David Ocker for implementing this trial is appreciated and the support of Pioneer Seeds for providing an electric weigh wagon is appreciated. The support of Dr. Dan Fromme, Extension Agronomist, for statistical analysis, and consultation is also appreciated.

TEXAS A&M AGRILIFE EXTENSION

GRAIN SORGHUM HYBRID PERFORMANCE EVALUATION

Texas AgriLife Extension Service
Nueces County, 2012
Cooperator: Jerry Faske Farm

Authors: Jeffrey R. Stapper, County Extension Agent -AG/NR
J.R. Cantu, Demonstration Assistant- Nueces County

Summary

This test was located on the Faske Farm east of Bishop on CR 6. Soil conditions at planting were marginal. Rainfall was below normal in the growing season. Sorghum hybrids were evaluated for agronomic performance. The best performing hybrid in this test was KS 735 at 2,929 pounds per acre, while the test average was 2,379 pounds per acre.

Objective

To evaluate commercially available and experimental grain sorghum hybrids growing under Nueces County conditions in a side-by-side evaluation.

Materials and Methods

Grain sorghum hybrids were planted in a side-by-side comparison with a tester hybrid SP 6929 planted throughout the test to account for field variability. Each plot consisted of 8 rows 884 feet in length. Seed was planted using an IH Model 92 Cyclo-Air Planter. Rainfall in the season was below normal and rainfall occurred as follows; March = 0.42 inch, April = 0.66 inch, May = 3.3 inches, June = 1.05 inches, and July=1.15 for a total of 6.58 inches during growing season. The plots were machine harvested on July 10, 2012 and weights obtained from combine yield monitor.

Table 1: Agronomic data for grain sorghum hybrid demonstration, Faske Farm, Nueces County, Texas, 2012.

Planting Date: 3/15/2012	**Rows/Plot:** 8	**Row Width:** 36 inch
Fertility: 250# 22-11-0	**Herbicide:** None	**Previous Crop:** Grain Sorghum
Planting Rate: 56,000 plants/Ac	**Soil Type:** Victoria clay	**Insecticide:** Seed treatment

Results and Discussion

Table 2. Comparison of plant population per acre, percent moisture, bushel weight, and yield per acre between hybrids, Faske Farm, Nueces County, TX, 2012.

Sorghum Hybrid	Plants/Acre	Moisture %	Bu. Wt. (Lbs.)	Yield/Acre[1] (Lbs.)
Sorghum Partners KS735	50,750	12.1	66.1	2,929
Golden Acres 5613	55,583	13.2	50.6	2,831
DeKalb DKS53-67	60,718	13.8	73.2	2,775
Sorghum Partners K73-J6	50,750	12.8	60.4	2,675
Sorghum Partners 6929	56,187	14.2	55.6	2,634
Golden Acres X2251	55,281	14.2	45.9	2,563
Sorghum Partners NK5418	54,375	12.3	57.5	2,549
Sorghum Partners NK7633	47,427	13.0	64.7	2,537
Golden Acres X2256	51,656	12.2	42.6	2,508
Terrel RV9782	60,416	13.5	62.2	2,356
Golden Acres X2255	55,885	13.1	41.5	2,317
B-H Genetics 5350	56,791	12.6	58.5	2,292
Golden Acres 5556	55,885	12.8	38.9	2,287
Golden Acres 3552	57.093	12.7	49.4	2,279
Golden Acres X2254	52,562	12.7	40.2	2,246
Golden Acres 3545	57,093	14.4	47.1	2,170
Triumph TRX05361	54,677	12.9	57.0	2,159
Golden Acres 3696	54,072	12.8	46.7	2,151
Sorghum Partners KS585	58,604	13.5	48.1	2,130
Gayland Ward 9417	53,468	13.4	46.0	2,118
Golden Acres 737	49,239	12.3	35.9	2,113
B-H Genetics 5227	62,531	14.0	54.6	2,067
Sorghum Partners NK7829	53,468	14.3	51.9	2,033
AVERAGE	54,978	13.1	51.9	2,379

[1]Yield per acre is reported in pounds per acre and adjusted to 14% moisture. The yields are also adjusted using accuracy testing to account for field variations.

Conclusions

Using the market price at harvest $10.00 per cwt, the top yielding hybrid had a value of $292.90/acre, while the least productive hybrid was valued at $203.30 per acre, a difference of $89.60 per acre. This significant difference between hybrids illustrates the need to continue to evaluate hybrids for their production performance under local conditions.

Acknowledgements

The cooperation and support of Jerry Faske, James Faske, Sharon Zieschang and Cathy Zieschang and the staff at Faske Farms for implementing this demonstration is appreciated and the support of seed companies by providing seed is also appreciated. The support of Chris Cernosek of Sorghum Partners, for collecting data at harvest is also greatly appreciated.

Table 7. Nueces County Sorghum Hybrid Trial

Cooperator: Texas A&M AgriLife Research & Extension Center at Corpus Christi
Dr. Dan D. Fromme, Assistant Professor and Extension Agronomist
Rudy Alaniz, Technician and Clinton Livingston, Technician

Company	Hybrid	Moisture (%)		Bu. Wt. (lbs.)		Lbs./Acre[1]	
Sorghum Partners	SP 6929	13.63	a	56.13	bc	4898.8	a
DeKalb	DKS 53-67	13.7	a	58	a	4886	a
Terral	REV 9782	13.33	a	56.13	bc	4721.8	a
Triumph	TRX 05361	13.13	a	54.88	c	4503.8	a
Golden Acres	GA 3545	13.55	a	57	ab	4465	a
Dyna-Gro	DG 771-B	13.68	a	56.75	ab	4369.3	a
Gayland Ward	GW 9417	13.38	a	57.75	ab	4005.5	a
BH Genetics	BH 5227	13.28	a	56.13	bc	3695.8	a
Mean		13.46		56.59		4443	
P>F		0.3024		0.0237		0.4684	
LSD (P=0.05)		NS		1.711		NS	
Standard Deviation		0.371		1.163		848.73	
CV%		2.76		2.06		19.1	

Means in a column followed by the same letter are not significantly different by ANOVA.
[1]Adjusted to 14% moisture.
Planting date: 2/22/12
Emerged: 2/29/12
Harvest date: 6/19/12
Row spacing: 38 inches
Irrigated: no
Replicated: Each hybrid was replicated four times in a RCB design.
Plot sizes: 4 rows by 35 feet.

EFFECTIVENESS OF SORGHUM MIDGE RESISTANT HYBRIDS AS MEASURED WITH AND WITHOUT INSECTICIDE TREATMENT

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

Roy D. Parker
Extension Entomologist
Corpus Christi, Texas

SUMMARY: Both sorghum midge hybrids evaluated sustained significantly less damage from the insect whether it was treated with insecticide or not. No benefit was gained by treating the PH01 hybrid with insecticide for sorghum midge, but there was benefit in treating the other midge resistant hybrid PH02. Even using 3 treatments on the susceptible hybrid did not reduce the midge damage level to that observed in the PH01 hybrid, and there was no statistical difference in the treated 85G85 susceptible hybrid and the untreated PH02 resistant hybrid.

OBJECTIVES: Midge resistant sorghum hybrids were compared with a non-resistant sorghum hybrid with and without a foliar insecticide applied for the insect to determine midge damage levels and effectiveness of the insecticide on sorghum midge.

MATERIALS/METHODS: Three sorghum hybrids were planted on April 10, 2012 at the Meaney Annex of the Texas A&M AgriLife Research and Extension Center at Corpus Christi. The sorghum was planted late so that high sorghum midge numbers would likely be present during the bloom period. Test plots were 4 rows by 35 feet with another 4 buffer rows between treatments. Rows were spaced on 38-inch centers. A John Deere 7100 planter equipped with research cone planter units was used to distribute the seed in a randomized complete block design with 4 replications of the treatments.

Baythroid XL (1.3 oz/acre) was applied on three dates (June 1, 4, and 7) during the bloom period for the sorghum midge. These treatments were made with a Spider Trac sprayer calibrated to deliver 8.4 gpa total volume through 8X hollow cone nozzles (2/row) at 45 psi traveling at 5 mph.

Treatments were assessed by examination of sorghum heads to confirm presence of damaging numbers of sorghum midge, by visually estimating percentage midge damage to heads during the soft dough stage of seed development, and by determination of head weights from the various plots. The head weights were used as a measure of destruction of seed by sorghum midge. Resulting data were subjected to analysis of variance using Agriculture Research Manager (ARM revision 6.1.13) software, and means were separated by LSD at the 0.05 probability level.

RESULTS/DISCUSSION: Sorghum midge numbers were relatively high during bloom when the first heads reached about 35% bloom. Due to drought sorghum bloom was erratic with some plants never producing a head. Even so, useful data were obtained by examination of selected sorghum heads to determine midge damage levels during the soft dough stage of development (Table 1). The two untreated sorghum midge resistant hybrids sustained much less damage compared to the susceptible Pioneer 85G85. The resistant PH01 with no insecticide sustained less damage than the insecticide treated susceptible hybrid (85G85). The three insecticide treatments significantly reduced midge damage in the susceptible hybrid and also in PH02, the resistant hybrid.

Yield data were not obtained due to the lack of heads present in the test, but heads were harvested and wet weights were obtained by selection of exerted heads. Although no statistical differences were observed in the head weights, all insecticide treated plots for all hybrids had greater head weights, than the susceptible untreated hybrid.

The experimental hybrids used in this study were donated by DuPont Pioneer Hi-Bred International.

ACKNOWLEDGMENTS: Thanks are expressed to John Jaster, Pioneer Hi-Bred International for supplying the seed and his interest in the midge resistant hybrid work. Rudy Alaniz and Clint Livingston, Demonstration Assistants, are acknowledged for their help in land preparation and all other aspects of production.

Table 1. Evaluation of midge resistant and susceptible sorghum hybrids with and without insecticide treatment, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Hybrid	Type	Insecticide treated[1/]	% midge damage	Head wet wt(g)
PH01	resistant	No	1.3[d]	169.1[a]
PH01	resistant	Yes	0.7[d]	193.9[a]
PH02	resistant	No	25.8[b]	154.3[a]
PH02	resistant	Yes	6.3[cd]	233.2[a]
85G85	susceptible	No	67.2[a]	140.0[a]
85G85	susceptible	Yes	19.5[bc]	175.0[a]
LSD (P = 0.05)			15.38	NS[2/]
P > F			.0001	.1595

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Baythroid XL (1.3 oz/acre) was applied on June 1, 4, and 7.
[2/]NS = Not Significant

EVALUATION OF INSECTICIDES FOR CONTROL OF STORED SORGHUM INSECT PESTS AND THE EFFECT OF THESE INSECTS ON GRAIN VALUE

Months Four - Ten of Storage

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

Roy D. Parker
Extension Entomologist
Corpus Christi, Texas

SUMMARY: The stored grain study was maintained for 324 days, and data collection was made on a monthly basis. The first 3-month storage period results were provided in an earlier report (Parker 2011). Grain moisture and temperature levels were elevated in the untreated sorghum, and in the less effective insecticide treatments. Actellic (alone) treated grain had elevated temperatures primarily as a result of very high lesser grain borer infestation; it was demonstrated in previous studies that Diacon should be added to Actellic for the lesser grain borer. Since the lesser grain borer produces so much fine dust this same treatment had high levels of rusty grain beetles during the last few months of the study. All insecticide treatments kept red flour beetle numbers significantly lower than in the untreated sorghum. Storcide and Sensat were the most effective insecticides thoughout the test period on rice weevil. Lesser grain borer infestation reached highest numbers in the Actellic (alone) treatment. Other stored grain insect numbers were elevated in the untreated grain (see listing of the insect species listed as "other" later in the report). Storcide and Sensat treatments generally contained far fewer total pest insects compared with numbers found in Actellic (alone), Actellic + Diacon, and untreated grain. Two species of natural enemies of stored grain pest insects were observed and may have had impact on pest insect numbers especially in the untreated grain. Least total dollar losses due to the stored grain insect attack were found for the Storcide and Sensat treatments. Loss in dollar value of the grain was near 1% for the Storcide treatments, between 2-3% for the Sensat treatments, 7.8% for the Actellic + Diacon treatment, 16.3% for the untreated, and 21.8% for the Actellic (alone) treatment.

OBJECTIVES: The experiment was conducted to measure the effectiveness of insecticides applied to stored grain sorghum on insect pests and to determine impact of treatments on grain value.

MATERIALS/METHODS: Sorghum harvested in 2011 was held at the Bee County Cooperative, Tynan, Texas for about 2 months before it was treated with insecticides for stored grain insects. The grain was measured in 50 lb increments and treated on August 30, 2011 in a concrete mixer by applying equivalent to 5 gallons of spray volume/60,000 lb. Four 50 lb samples of each treatment were placed in 30 gallon drums for a total of 200 lb/drum. Each drum was weighed to determine exact starting weight of the sorghum, and bushel weight was determined. Each treatment was replicated 4 times and later arranged in randomized complete block experimental design on the floor of the shop building at the Texas A&M AgriLife Research and Extension Center at Corpus Christi. Drums were covered with 0.5-inch hardware cloth to keep out birds, rodents and other unwanted animals. Initial samples were taken 9 days after treatment. Immediately following sampling (before actual counts were made in the samples) 10 live specimens each of rusty grain beetle, red flour beetle, rice weevil, and lesser grain borer were added to each drum. Insects from surrounding natural infestations from inside and outside the building had access to the experimental grain.

Treatments were assessed monthly by (1) measuring grain temperature with a 12-inch thermometer pushed into the center of the grain mass approximately 11.0 inches, (2) using a grain probe at 5 locations in each drum to obtain quart samples of grain for insect counts and moisture determination, (3) separating insects from the grain using a Seedburo Equipment Company sieve [8/64-inch triangle holes] and counting them under a Circline magnifier lamp, (4) collecting 1,000 gram samples of grain at the end of the study and sending these samples to the Corpus Christi Grain Exchange for quality determination [insects were eliminated from these samples with phosphine gas], and (5) using starting and ending grain weights along with grain quality reports to determine losses.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance and means were separated by LSD (least significant difference).

RESULTS/DISCUSSION: Grain moisture levels remained relatively stable throughout the storage period, but there were treatment effects due to insect numbers (Table 1). At 8 months into the storage period the Actellic (alone) treatment had a significantly higher moisture level than any of the other treatments including the untreated, but by 9 months there was no difference between the moisture level in Actellic (alone) and the untreated grain. It will be shown later that this result was caused by very high insect pest numbers in those two treatments. By 5 months into the storage period grain temperature was significantly higher in the untreated sorghum (Table 2), and by the 6^{th} and 7^{th} month the temperatures were elevated in the Actellic (alone) treated grain corresponding to the moisture increase noted above. During the remaining storage months additional treatments showed higher temperatures which will be shown later to be due to higher insect numbers in the treatments. These higher temperatures followed closely the treatments with higher insect counts (generally matched in order higher temperatures compared with numerically increasing insect numbers).

Rusty grain beetle numbers were highest in the untreated sorghum from the 4^{th} through the 8^{th} storage months, but it was obvious through this period that the Actellic (alone) treatment consistently had the highest numbers of all the tested insecticides (Table 3). By the last two storage months (9 and 10) more rusty grain beetles were observed in the Actellic (alone) treatment. In fact, significantly more rusty grain beetles were found in the Actellic (alone) treatment in the final storage month than any of the other treatments, including the untreated sorghum. This observation may have been due to the large accumulation of dust in this treatment caused by the lesser grain borer since the rusty grain beetle is known to feed on grain dust. All of the other insecticides maintained rusty grain beetles at low levels.

Red flour beetle numbers were relatively low during the entire test period with the untreated sorghum consistently having the highest number (Table 4). In storage months 9 and 10 significantly more red flour beetles were found in the untreated grain. Their numbers did exceed the rule-of-thumb treatment threshold of 5/quart sample of grain for secondary feeding insects. All insecticide treatments kept red flour beetle numbers low throughout the 10 month storage period.

The primary insects (whose larvae live inside whole kernels) detected included rice weevil, lesser grain borer and angoumois grain moth. The angoumois grain moth was in such low numbers that it was included in the "other" insects reported later. Rice weevil and lesser grain borer infestations are provided in Tables 5 and 6, respectively. Both insects had reached high levels as reported in the previous preliminary report (Parker 2011). By the 4th storage month (January) rice weevil numbers were very high in the untreated sorghum, far exceeding all other treatments; however, within the next two months their numbers increased rapidly in the Actellic and Actellic + Diacon II treatments. Diacon has no effect on rice weevil since the immature insect is never exposed to the product as the female weevil lays eggs inside kernels and the product has no effect on adult insects. By the 7th storage month (April) rice weevil infestations had exceeded the recommended treatment level of 1.0/quart sample in all treatments. There were, however, differences in the effectiveness of tested insecticides. Storcide treatments tended to have the fewest rice weevils. It was a surprise to find high numbers of rice weevil in the Actellic treated sorghum as it has proven in the past to be effective on that insect. Another test will be set up to look into the situation of Actellic effects on rice weevil. After reaching very high numbers in the untreated sorghum, rice weevil numbers began to decline possibly due to crowding or attack by natural enemies.

Similar to results found in previous studies, lesser grain borer numbers were much higher in the Actellic (alone) treatment; in fact, they were in significantly greater numbers in this treatment than even found in the untreated sorghum in all inspection months (Table 6). Evidently, removal of other insects from the system with Actellic results in a reproductive explosion in lesser grain borer. Again, this same observation was made in previous studies. The lesser grain borer remained low in all treatments except for the Actellic (alone) and untreated sorghum until the 9th and 10th storage months.

Pest insects that occurred in relatively low number and not in all months (Indian meal moth, corn sap beetle, longheaded flour beetle, and angoumois grain moth) were classified as "other" and their combined numbers are shown in Table 7. Except for the 8th month (May) their numbers were much higher in the untreated grain.

All pest insects combined are presented in Table 8. The most striking result was the very large number of insects found in the Actellic (alone) treatment, and as pointed out above, a high percentage of the insects in this treatment were lesser grain borers. Storcide and Sensat treated sorghum generally contained far fewer stored grain pest insects than the Actellic (alone), Actellic + Diacon, and untreated sorghum.

Two species of parasitoids (parasites of stored grain insects) were found in high numbers (Tables 9 and 10). The *Anisopteromalus calandrae* wasp is the most important parasite of the rice weevil and possibly other internal seed feeding larvae. They were detected first in the Actellic (alone) treatment followed a month later by detection in the untreated sorghum. By the 8th month of storage significantly more were observed in Actellic (alone), Actellic + Diacon, and untreated sorghum. The other parasitoid, *Theocolax elegans*, was consistently high in untreated sorghum, and by the 8th storage month they were also found in relatively high numbers in the Actellic + Diacon treatment.

The sorghum was graded as number 1, 2 or sample grade by the Corpus Christi Grain Exchange. The number 3 was assigned to the sample grade designation for data analysis. The grain grade information is provided in Table 11. Poor grade numbers were found for the untreated, Actellic + Diacon and Actellic (alone) treatments. Number 1 or 2 grades were characteristic of the Storcide and Sensat treatments. Bushel weights were heavier for the higher grades, lower moisture levels also reflected better quality, and there were no differences in BKFM or foreign material. Damaged kernel, dockage, and insect damaged kernels were high in Actellic (alone) and untreated grain which reflected the severe insect infestations in these treatments. Actellic (alone) had significantly more damaged kernels, dockage, and insect damaged kernels than any of the other treatments including the untreated sorghum. This result was due to the extremely high lesser grain borer infestation in the Actellic (alone) treatment.

Initial and final grain weight along with the grain quality readings were used to establish losses in the value of the grain during the storage period (324 days). Significantly higher weight loss was found in the Actellic (alone) and untreated sorghum, and the Actellic + Diacon treatment sustained greater weight loss than the other treatments. Discounts due to quality loss ranged from none in the better treatments to $1.09/cwt in the Actellic (alone) treated grain. Least total dollar losses due to the stored grain insect attack were found for the Storcide and Sensat treatments. Loss in dollar value of the grain was near 1% for the Storcide treatments, between 2-3% for the Sensat treatments, 7.8% for the Actellic + Diacon treatment, 16.3% for the untreated, and 21.8% for the Actellic (alone) treatment. It is obvious from this and previous studies that Diacon must be included with Actellic to improve effectiveness on stored grain insects especially for the lesser grain borer. There is concern that the Actellic treatments in general were not as effective as other treatments. In previous studies the Actellic + Diacon treatment has performed very well. For this reason another stored grain study has been established to make additional observations.

RERFERENCES: Parker, R. D. 2011. Evaluation of insecticides applied to stored sorghum for protection against pest insects and their effect of grain characteristics: preliminary report, pp. 40-45. *In* Results of Insect Control Evaluations on Corn, Sorghum, Cotton, Pecan, & Stored Grain in Texas Coastal Bend Counties. Texas A&M AgriLife Extension.

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Table 1. Moisture of stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	13.4[a]	13.3[a]	13.5[a]	14.0[a]	14.0[bc]	13.5[b]	14.0[b]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	13.1[a]	13.3[a]	13.5[a]	13.9[a]	13.8[c]	13.6[b]	13.6[b]
Sensat (9.8 oz/60,000 lb)	13.1[a]	13.3[a]	13.6[a]	13.9[a]	13.9[bc]	13.4[b]	13.8[b]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	13.2[a]	13.3[a]	13.50[a]	13.9[a]	13.7[c]	13.6[b]	13.8[b]
Actellic (12.3 oz/60,000 lb)	13.2[a]	13.4[a]	13.6[a]	14.1[a]	14.7[a]	14.0[a]	15.2[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	13.1[a]	13.2[a]	13.6[a]	13.9[a]	13.9[bc]	13.6[b]	13.8[b]
Nontreated	13.1[a]	13.4[a]	13.8[a]	14.1[a]	14.2[b]	14.1[a]	15.1[a]
LSD (P=0.05)	NS[1/]	NS	NS	NS	.34	.30	.64
P > F	.2848	.1962	.3225	.3027	.0003	.0006	.0001

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

Table 2. Temperature of stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	66.3[a]	71.3[b]	75.3[c]	79.8[b]	82.3[d]	86.3[d]	89.3[cd]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	66.5[a]	71.0[b]	75.3[c]	80.0[b]	82.5[d]	86.3[d]	88.3[d]
Sensat (9.8 oz/60,000 lb)	66.0[a]	71.0[b]	75.0[c]	79.8[b]	82.0[d]	87.3[cd]	89.0[cd]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	66.3[a]	71.3[b]	75.5[c]	80.0[b]	82.5[d]	87.5[cd]	89.5[cd]
Actellic (12.3 oz/60,000 lb)	67.0[a]	72.5[b]	78.0[b]	89.5[a]	99.0[a]	98.8[a]	99.5[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	66.5[a]	71.5[b]	76.3[bc]	83.3[b]	86.5[c]	89.3[c]	91.0[c]
Nontreated	67.8[a]	74.5[a]	80.8[a]	88.3[a]	90.3[b]	95.3[b]	95.8[b]
LSD (P=0.05)	NS[1/]	1.59	2.33	3.75	2.69	2.34	2.30
P > F	.0565	.0018	.0005	.0001	.0001	.0001	.0001

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

Table 3. Rusty grain beetle in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0[c]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	1.0[c]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.0[c]	0.3[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.5[c]
Sensat (9.8 oz/60,000 lb)	0.3[c]	0.5[b]	0.5[b]	0.3[b]	0.0[b]	0.3[b]	1.0[c]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0[c]	0.0[b]	0.0[b]	0.3[b]	0.3[b]	1.0[b]	1.8[c]
Actellic (12.3 oz/60,000 lb)	8.3[b]	6.5[b]	1.3[b]	2.8[b]	4.0[b]	57.5[a]	169.0[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	0.0[c]	0.3[b]	0.0[b]	0.5[b]	0.0[b]	0.0[b]	3.0[c]
Nontreated	21.3[a]	22.3[a]	25.8[a]	49.3[a]	35.0[a]	39.3[a]	45.8[b]
LSD (P=0.05)	2.16	7.07	4.12	4.78	6.30	31.24	37.40
P > F	.0001	.0001	.0001	.0001	.0001	.0028	.0001

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

Table 4. Red flour beetle in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[b]	0.3[b]	0.5[b]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[b]	0.0[b]	0.5[b]
Sensat (9.8 oz/60,000 lb)	0.0[a]	0.3[a]	0.0[a]	0.3[a]	0.0[b]	0.0[b]	0.5[b]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[b]	0.0[b]	1.3[b]
Actellic (12.3 oz/60,000 lb)	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[b]	0.0[b]	1.0[b]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	0.0[a]	0.0[a]	0.0[a]	0.0[a]	0.0[b]	0.0[b]	4.8[b]
Nontreated	0.5[a]	0.3[a]	0.8[a]	0.0[a]	5.5[a]	11.0[a]	50.8[a]
LSD (P=0.05)	NS[1/]	NS	NS	NS	1.62	6.87	19.57
P > F	.4552	.5897	.4552	.4552	.0001	.0254	.0002

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

Table 5. Rice weevil in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0^{b}	0.3^{b}	0.5^{b}	1.3^{c}	2.8^{c}	0.5^{c}	2.0^{bc}
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.0^{b}	0.5^{b}	0.3^{b}	2.8^{c}	1.8^{c}	0.3^{c}	1.5^{c}
Sensat (9.8 oz/60,000 lb)	0.0^{b}	0.5^{b}	2.3^{b}	3.0^{c}	10.0^{c}	30.8^{b}	16.3^{a}
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0^{b}	0.3^{b}	0.8^{b}	4.3^{c}	8.3^{c}	29.8^{bc}	13.0^{ab}
Actellic (12.3 oz/60,000 lb)	0.0^{b}	0.8^{b}	1.3^{b}	5.0^{c}	15.8^{c}	13.5^{bc}	1.8^{bc}
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	2.3^{b}	10.5^{b}	11.3^{b}	56.0^{b}	64.3^{b}	82.8^{a}	21.5^{a}
Nontreated	41.5^{a}	59.5^{a}	74.5^{a}	110.5^{a}	114.5^{a}	71.5^{a}	20.8^{a}
LSD (P=0.05)	9.34	16.74	27.50	24.81	20.52	30.03	11.33
P > F	.0001	.0001	.0001	.0001	.0001	.0001	.0019

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

Table 6. Lesser grain borer in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0[c]	0.0[c]	0.3[c]	0.5[b]	0.5[c]	1.8[c]	10.5[c]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.3[c]	0.0[c]	0.0[c]	0.0[b]	0.3[c]	0.0[c]	0.3[c]
Sensat (9.8 oz/60,000 lb)	0.0[c]	0.0[c]	0.0[c]	0.0[b]	0.0[c]	0.0[c]	0.8[c]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0[c]	0.0[c]	0.0[c]	0.0[b]	0.0[c]	0.0[c]	1.0[c]
Actellic (12.3 oz/60,000 lb)	99.8[a]	109.0[a]	113.0[a]	203.3[a]	119.0[a]	151.3[a]	276.5[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	0.3[c]	0.0[c]	0.0[c]	0.0[b]	0.5[c]	0.0[c]	2.0[c]
Nontreated	11.5[b]	14.8[b]	11.8[b]	17.0[b]	24.0[b]	24.5[b]	76.3[b]
LSD (P=0.05)	9.36	13.20	6.90	20.32	14.53	19.79	31.25
P > F	.0001	.0001	.0001	.0001	.0001	.0001	.0001

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

Table 7. Other insects[1/] in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0[b]	0.0[a]	0.0[c]	0.0[a]	0.0[c]	0.0[a]	0.0[a]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.0[b]	0.5[a]	0.8[bc]	0.0[a]	0.3[bc]	0.0[a]	0.0[a]
Sensat (9.8 oz/60,000 lb)	0.0[b]	0.0[a]	1.0[bc]	1.0[a]	0.5[bc]	0.0[a]	0.0[a]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0[b]	0.0[a]	2.3[b]	1.0[a]	5.3[a]	0.3[a]	0.0[a]
Actellic (12.3 oz/60,000 lb)	0.0[b]	0.0[a]	1.0[bc]	0.0[a]	2.8[abc]	0.0[a]	0.0[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	1.0[a]	0.8[a]	1.5[bc]	1.0[a]	0.5[bc]	0.0[a]	0.0[a]
Nontreated	1.3[a]	1.3[a]	4.3[a]	3.0[a]	3.8[ab]	7.0[a]	17.0[a]
LSD (P=0.05)	0.28	NS[2/]	1.78	NS	3.68	NS	NS
P > F	.0001	.1521	.0026	.0756	.0429	.1517	.1462

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

[1/]Other insects included Indian meal moth, corn sap beetle, Angoumois grain moth, and longheaded flour beetle.

[2/]NS=Not Significant

Table 8. Total pest insects in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0[c]	0.3[b]	0.8[b]	1.8[d]	3.3[d]	2.5[d]	14.0[c]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.3[c]	1.3[b]	1.0[b]	2.8[d]	2.3[d]	0.3[d]	2.8[c]
Sensat (9.8 oz/60,000 lb)	0.3[c]	1.3[b]	3.8[b]	4.5[d]	10.5[d]	31.0[d]	18.5[c]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0[c]	0.3[b]	3.0[b]	5.5[d]	13.8[d]	31.0[d]	17.0[c]
Actellic (12.3 oz/60,000 lb)	108.0[a]	116.3[a]	116.5[a]	211.0[a]	141.5[b]	222.3[a]	448.3[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	3.5[c]	11.5[b]	12.8[b]	57.5[c]	65.3[c]	82.8[c]	31.3[c]
Nontreated	76.0[b]	98.0[a]	117.0[a]	179.8[a]	182.8[a]	153.3[b]	210.5[b]
LSD (P=0.05)	13.39	25.56	34.18	30.39	23.54	47.60	79.19
P > F	.0001	.0001	.0001	.0001	.0001	.0001	.0001

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

Table 9. *Anisopteramalus calandrae* (parasitoid) in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)		0.0[a]	0.0[a]	0.3[a]	0.0[c]	0.0[b]	0.0[b]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)		0.0[a]	0.0[a]	0.0[a]	0.0[c]	0.0[b]	0.0[b]
Sensat (9.8 oz/60,000 lb)		0.0[a]	0.0[a]	0.0[a]	0.0[c]	1.0[b]	0.5[b]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)		0.0[a]	0.0[a]	0.0[a]	0.5[c]	0.0[b]	0.8[b]
Actellic (12.3 oz/60,000 lb)		0.3[a]	0.0[a]	2.8[a]	12.0[a]	6.8[b]	1.0[b]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)		0.0[a]	0.0[a]	0.5[a]	4.3[bc]	4.5[b]	7.0[a]
Nontreated		0.0[a]	0.5[a]	1.3[a]	8.8[ab]	21.3[a]	7.0[a]
LSD (P=0.05)		NS[1/]	NS	NS	4.62	9.36	5.48
P > F		.4552	.4552	.2341	.0001	.0014	.0310

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

Table 10. *Theocolax elegans* (parasitoid) in stored sorghum during the fourth through the tenth month following treatment with grain protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Storage month number and calendar month post-treatment						
	4 Jan	5 Feb	6 Mar	7 Apr	8 May	9 Jun	10 Jul
Storcide II (11.6 oz/60,000 lb)	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[c]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	0.0[b]	0.3[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[c]
Sensat (9.8 oz/60,000 lb)	0.0[b]	0.5[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.8[c]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	0.0[b]	0.5[b]	0.0[b]	0.0[b]	0.5[b]	2.0[b]	0.8[c]
Actellic (12.3 oz/60,000 lb)	1.0[b]	0.0[b]	1.0[b]	2.8[b]	2.3[b]	3.5[b]	2.8[bc]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	0.0[b]	0.0[b]	2.8[b]	6.3[b]	18.0[a]	15.5[a]	4.5[b]
Nontreated	13.3[a]	11.3[a]	11.3[a]	51.0[a]	12.0[a]	13.3[a]	8.3[a]
LSD (P=0.05)	3.37	3.12	2.98	8.08	6.16	7.99	3.02
P > F	.0001	.0001	.0001	.0001	.0001	.0013	.0001

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

Table 11. Characteristics of stored grain sorghum at 324 days after treatment with insect protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

			%				
Treatment (rate)	Grade[1/]	Bushel Weight	BKFM[2/]	Foreign material	Damaged Kernels	Dockage	Insect da. kernels
Storcide II (11.6 oz/60,000 lb)	1.8[c]	59.7[a]	2.2[a]	0.4[a]	2.8[d]	0.30[c]	1.0[cd]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	1.8[c]	59.3[ab]	2.0[a]	0.3[a]	2.5[d]	0.25[c]	0.3[d]
Sensat (9.8 oz/60,000 lb)	1.8[c]	58.5[b]	2.5[a]	0.4[a]	2.9[d]	0.40[c]	0.8[cd]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	2.3[bc]	58.5[b]	2.2[a]	0.3[a]	3.5[d]	0.40[c]	1.4[cd]
Actellic (12.3 oz/60,000 lb)	3.0[a]	55.5[d]	3.8[a]	0.4[a]	20.6[a]	5.85[a]	19.5[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	2.8[ab]	56.9[c]	2.4[a]	0.4[a]	8.2[c]	1.08[bc]	5.3[c]
Nontreated	3.0[a]	55.6[d]	2.7[a]	0.5[a]	14.8[b]	2.20[b]	13.1[b]
LSD (P=0.05)	0.64	1.02	NS[3/]	NS	4.40	1.368	4.72
P > F	.0004	.0001	.2898	.6578	.0001	.0001	.0001

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

[1/]Grades listed as number 1or 2 yellow sorghum. A 3 factor was given to sample grade readings so the data could be analyzed statistically.

[2/]BKFM = Broken kernels and foreign material.

[3/]NS=Not Significant

Table 12. Loss factors in stored grain sorghum at 324 days after treatment with insect protectants, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment (rate)	Initial value $/storage drum	$ loss/cwt			% loss in grain value
		weight	discount	total	
Storcide II (11.6 oz/60,000 lb)	23.57[a]	0.13[c]	0.0[c]	0.13[d]	1.1[d]
Storcide II+Diacon II (11.6+3.5 oz/60,000 lb)	23.47[a]	0.06[c]	0.0[c]	0.06[d]	0.5[d]
Sensat (9.8 oz/60,000 lb)	23.47[a]	0.29[c]	0.0[c]	0.29[d]	2.5[d]
Sensat+Actellic (9.8+6.15 oz/60,000 lb)	23.53[a]	0.29[c]	0.03[c]	0.32[d]	2.7[d]
Actellic (12.3 oz/60,000 lb)	23.51[a]	1.47[a]	1.09[a]	2.56[a]	21.8[a]
Actellic+Diacon II (9.2+3.5 oz/60,000 lb)	23.49[a]	0.68[b]	0.25[c]	0.92[c]	7.8[c]
Nontreated	23.63[a]	1.29[a]	0.63[b]	1.92[b]	16.3[b]
LSD (P=0.05)	NS[1/]	.346	.312	.599	5.10
P > F	.1513	.0001	.0001	.0001	.0001

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

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ALTERNATIVE CROPS

Page #

SAFFLOWER VARIETY EVALUATION
Texas A&M AgriLife Extension Service

NUECES COUNTY, 2012

Cooperator: Texas A&M AgriLife Research & Extension Center

Authors: Jeffrey R. Stapper, County Extension Agent -AG/NR
Daniel Hathcoat, Extension Program Specialist
J. R. Cantu, Demonstration Assistant - Nueces County

Summary

This test was located at the Research & Extension Center on Hwy 44. Rainfall early in the growing season was below normal, while February was above normal. Some rust appeared in late January. The winter type varieties did not perform, while spring types produced depressed yields due to lack of deep soil moisture.

Objective

To evaluate safflower varieties for yield and production in South Texas and determine the economics of producing these crops and potential risks associated with production.

Materials and Methods

Safflower was planted on December 2, 2011 at 25 lbs. /ac, at Clarkwood on the Texas A&M AgriLife Research & Extension Center in a randomized complete replicated block with four replications. Seeds were planted at a depth of 1.0 inch in 7 rows per plot (7-inch row spacing). Soil tests indicated a pH of 7.8 and a fertilizer recommendation of 85-25-0 for a 2,000 pound canola yield potential. This was used since a canola test was also planted in the same field. Fertilizer of (67-0-0) was applied on November 16, 2011 and incorporated. Trifluralin 4EC @ 1.5 pt/ac was incorporated on November 16, 2011. Rainfall recorded during the growing season was as follows; December = 1.09 inches, January = 0.49 inch, February = 3.82 inches, March = 2.12 inches, and April = 1.29 inches.

Table 1: Agronomic data for Safflower Variety Demonstration, AgriLife Research & Extension Center Nueces County, Texas, 2012

Planting Date: December 2, 2011	**Plot Size:** 5' x 20' replicated 4 times	**Row Width:** 7 inch
Fertility: 11/16/11 67-0-0	**Soil Type:** Clareville loam	**Previous Crop:** Cotton
Planting Rate: 25 lbs./acre	**Herbicide:** Treflan @ 1.5 pt/A	**Harvest:** 5/17/12

Results and Discussion

Harvesting of safflower usually occurs when most of the leaves have turned brown and the flower bracts show only a green tint. Seeds should have a moisture content of 8 percent or less for safe storage. The harvest of this safflower occurred on May 17, 2012 with a plot combine. Results were adjusted to 10 percent moisture to help standardize the weights. The actual moisture content of both of these varieties was about 6.5%.

Table 2. Comparison of yield per acre of safflower variety test, AgriLife Research & Extension Center, Nueces County, Texas, 2012.

Safflower Variety	Grain Moisture (%)	Test Weight (lbs./bu)	Yield (lbs./acre)	Value/Acre[1]
CW - 99 OL	6.30 a	30.73 a	548.4 a	$126
CW - 3268-OL	6.15 a	32.03 a	373.2 a	$86
Mean	6.23	31.38	460.8	
LSD (P=.05)	0.276	4.732	444.4	
Standard Deviation	0.122	2.103	197.5	
CV	1.97	6.7	42.9	

Means followed by same letter do not significantly differ (P=.05, LSD)

[1] *Estimated value per acre assumes a price of $0.23 per pound.*

Other safflower lines in the test did not perform which means that no seed was produced. Those experimental lines included PI 406002, PI 388901, PI 388903, and PI 485984. These lines are more adapted to the central and northern areas of Texas.

Conclusions

Today there is renewed interest in safflower seed for its oil and food use. Before the 1960's in the U.S., the oil was used mostly as a base for paints, and is still used for that today. However, it is also being used in infant formulas, cosmetics, and salad and cooking oils. Safflower meal is about 24 percent protein and high in fiber and is used as a protein supplement for livestock and poultry feed. Whole safflower seeds are used in the birdseed industry.

Safflower is a deep tap rooted plant that can draw nutrients from depths of 6 to 8 feet; however, unless there is good soil moisture at planting in the seedbed, this advantage of a deep taproot will not be realized which is what was experienced in 2012. This experiment will be duplicated again on this site in 2013 with more varieties adapted to South Texas.

Acknowledgements

The cooperation and support of Kenneth Schaefer and the staff of Texas A&M AgriLife Research for helping implement this demonstration is appreciated. The support of seed companies by providing seed is also appreciated.

TEXAS A&M AGRILIFE EXTENSION

SESAME VARIETY EVALUATION

Texas A&M AgriLife Extension Service
Nueces County, 2012

Cooperator: Texas A&M AgriLife Research & Extension Center

Authors: Jeffrey R. Stapper, County Extension Agent -AG/NR
J. R. Cantu, Demonstration Assistant - Nueces County

Summary

This test was located on the Research & Extension Center on HWY 44. Rainfall during the growing season was very low and totaled less than one inch. Yields ranged from a low of 417 pounds per acre to a high of 660 pounds per acre. Under normal rainfall conditions one would expect yields to be three times what was produced this year.

Objective

To evaluate sesame varieties for yield and production in South Texas and determine the economics of producing this crop and potential risks associated with production.

Materials and Methods

Sesame was planted on May 17, 2012, at Clarkwood on the Texas A&M AgriLife Research & Extension Center in a randomized complete replicated block with four replications. Rainfall during growing season was May= 2.93 inches, June=1.38 inches, July=0.73 inch, August=0.20 inch, September=0 inch, for a total of 5.24 inches. The sesame was planted with a John Deere MaxEmerge2 Planter (setting Driver 29: Driven 26) Vacuum @ 4 PSI using 45 hole sorghum plates to a seeding depth of 0.75 inches following an early May rainfall event. Plots were hand harvested on September 13, 2012.

Table 1: Agronomic data for Sesame Variety Test, AgriLife Research & Extension Center Nueces County, Texas, 2012.

Planting Date: May17, 2012	**Plot Size:** 4 rows plots	**Row Width:** 38-inch
Fertility: 11/16/10 67-0-0	**Soil Type:** Clareville loam	**Previous Crop:** Grain Sorghum
Planting Rate: 2.5 lbs/acre	**Herbicide:** 1.3pts Dual II Magnum 1 qt. Roundup WeatherMax pre-harvest	**Harvest:** 9/13/12

Results and Discussion

The below normal rainfall certainly hurt yields and the stress related to lack of soil moisture attributed to the onset of the disease of charcoal rot that was noted in all the plots.

Table 2. Comparison of maturity type and yield per acre between varieties, AgriLife Research & Extension Center, Nueces County, Texas, 2012.

Variety	Maturity Type	Yield/Ac (lbs.)
S36	Late	660
S26	Late	585
S35	Medium	562
S34	Medium	538
S32	Early	480
S30	Early	417

Table 3. Comparison of growth types between varieties, AgriLife Research & Extension Center, Nueces County, Texas 2012.

Variety	Field Notes by Charles Stichler
S36	Green and blooming when other varieties were defoliating – very drought tolerant
S26	Growth habit – branching, suitable for wide rows, fair drought tolerance
S35	Upright growth habit- some branching, very drought tolerant
S34	Upright growth habit – single stem, good drought tolerance
S32	Upright growth habit, some branching but suited for narrow rows – early maturing
S30	Single stem- no branching, good for ultra-narrow rows- early maturing

Conclusions

Although sesame is a very drought tolerant crop, adequate moisture is needed to produce good yields, as peak water demand for the crop occurs during flowering. Assuming a contract price of $0.40 per pound, gross income in this test plot ranged from a low of $166.80/acre to a high of $264/acre. Below normal rainfall had a dramatic impact on production as one would expect yields to be three times what was produced in this test plot.

Acknowledgements

The support and cooperation provided by staff of Texas A&M AgriLife Research, including Kenneth Schaefer and staff of SESACO, and Charles Stichler in the implementation of this test is appreciated. The assistance of Dr. Gary Odvody, Research Plant Pathologist in disease evaluations is also appreciated.

TEXAS A&M AGRILIFE EXTENSION

Agriculture and Natural Resources

WHEAT VARIETY EVALUATION
Texas A&M AgriLife Extension Service
Nueces County, 2012

Cooperator: Texas A&M AgriLife Research & Extension Center

Authors: Jeffrey R. Stapper, County Extension Agent -AG/NR
Daniel Hathcoat, Extension Program Specialist
J.R. Cantu, Ag Demonstration Assistant

Summary
This test was located at the Research & Extension Center on Hwy 44. Rainfall early in the growing season was below normal while stored soil moisture was very short due to no rain in the fall. Rabbits applied heavy grazing pressure early in the growing season which hurt yields. There were some significant differences in vernalization between varieties.

Objective
To evaluate both spring and winter wheat varieties for yield and production in South Texas and determine the economics of producing these crops and potential risks associated with production.

Materials and Methods
Wheat was planted December 2, 2011 at 50 lbs./acre, at Clarkwood on the Texas A&M AgriLife Research & Extension Center in a randomized complete replicated block design with four replications. Soil test indicated a pH of 7.8 and a fertilizer recommendation of 50-10-0 for 59 bushel yield potential. Fertilizer (67-0-0) was applied on November 16, 2011. Rainfall recorded during the growing season was as follows; December=1.09 inches, January=0.49 inches, February=3.82 inches, March=2.12 inches, April= 1.29 for a total of 8.81 inches in the growing season. Cultivars were machine harvested on May 17, 2012.

Table 1: Agronomic data for Wheat Variety Test, Research & Extension Center, Nueces County, TX 2012.

Planting Date: 12/ 2/ 2011	**Plot Size:** 5' x 20' replicated four times	**Row Width:** 8 inch
Fertility: 11/16/11 67-0-0	**Soil Type:** Clareville loam	**Previous Crop:** Cotton
Planting Rate: 50 lbs/ac	**Herbicide:** Huskie on 12/21 12 oz/Acre	**Harvest:** May 17, 2012

Results and Discussion

Temperatures in March and April were above normal. Heavy grazing pressure by rabbits early in the season and very dry conditions hurt yields. Vernalization scores were taken the day of harvest.

Table 2: Comparison of percent moisture, test weight, vernalization score, and yield per acre, Research & Extension Center, Nueces County, Texas, 2012

Wheat Variety[3]	Moisture (%)	Test Weight (Lb/Bu)	Vernalization (0-5)[2]	Yield[1] (Bu/Acre)
Faller	***10.75 abc***	***54.63 a***	***5.0 a***	***14.4 a***
Howard	***11.20 abc***	***55.33 a***	***5.0 a***	***13.2 ab***
Prosper	***10.78 abc***	***53.06 ab***	***4.0 b-e***	***12.5 abc***
TAM 203	10.85 abc	51.93 abc	4.3 a-d	11.5 a-d
Santa Fe	11.55 a	55.35 a	4.5 abc	9.7 b-e
Barlow	***11.10 abc***	***55.88 a***	***4.5 abc***	***9.7 b-e***
Greer	10.13 cde	54.06 ab	4.8 ab	8.8 c-g
TAM 401	10.98 abc	40.08 bcd	4.5 abc	8.1 d-g
Shocker	11.30 ab	51.57 abc	3.0 fg	7.7 d-g
Billings	11.23 abc	55.09 a	3.3 efg	6.6 e-h
Expresso	***10.35 b-e***	***37.85 cd***	***3.5 def***	***6.3 e-i***
Jagalene	10.82 abc		0.8 jk	3.7 h-l
Amour	11.02 abc	46.33 a-d	1.8 hi	2.7 i-l
Jackpot	9.30 efg	2.14 e	1.5 ij	2.4 jkl
Fannin	8.49 fg	2.28 e	1.3 ij	2.0 kl
Fuller	-	-	0.0 k	0
Duster	-	-	0.0 k	0
Deliver	-	-	0.0 k	0
Endurance	-	-	0.0 k	0
Pete	-	-	0.0 k	0
Coronado	-	-	0.0 k	0
TAM 304	-	-	0.0 K	0
Sturdy 2K	-	-	0.0 K	0
Cedar	-	-	0.0 k	0
Weathermaster 135	-	-	0.0 k	0
LSD (P=.05)	1.146	14.112	0.86	3.81
CV	7.69	21.47	23.81	36.42
MEAN	10.54	46.47	2.58	7.4

[1]Yield is adjusted to 10% moisture.

[2]Vernalization score was a visual observation on day of harvest with 0 being no seed heads present and 5 being fully headed.

Means followed by same letter do not significantly differ (P=.05, LSD)

[3]Varieties marked in Bold Italics are Hard Red SPRING Wheat and all other varieties are Hard Red WINTER Wheat.

Conclusions

During times of drought in Nueces County, small grain tests in small plots are susceptible to significant damage from rabbit grazing, as was the case in this study. Numerous varieties were kept grazed to the ground by these rabbits early in the season when these plots were the only green forage available for miles.. Moreover, the lack of significant rainfall in the fall due to the drought of 2011 hurt the crop as well. Rainfall in the spring of 2012 allowed the crop to recover to some degree. Vernalization (heading) differences were noted between the varieties. Most of the spring types vernalized almost completely, while most of the winter types had little to no heading observed at harvest. However, TAM 203, Santa Fe, Greer, and TAM 401 all had significantly higher vernalization scores than the other winter types. These increases in heading correlated to yield. TAM 203 was in the top grouping of this trial with three other spring varieties (Faller, Howard, and Prosper). This trial is intended to be repeated in subsequent years to gain better knowledge on the yield potential between spring and winter varieties when grown in Nueces County. Due to the climate and the wildlife grazing, this trial had a lot of variation within the data. It is important for the reader to utilize numerous data from multiple years and locations to make an informed production decision.

Acknowledgements

The cooperation and support of Kenneth Schaefer and the staff of Texas A&M AgriLife Research for implementing this demonstration is appreciated. The support of seed companies by providing seed is also appreciated.

DEVELOPMENT OF COST EFFECTIVE METHODS FOR SUNFLOWER MOTH CONTROL IN SOUTH TEXAS

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

Roy D. Parker and Calvin L. Trostle
Extension Entomologist and Extension Agronomist, respectively
Corpus Christi and Lubbock, Texas

SUMMARY: Prevathon manufactured by DuPont Crop Protection is currently not labeled for sunflower, but the crop is expected to be added to the label at some point in the future. In the first study Prevathon was compared to two currently labeled products (Karate insecticide with Zeon Technology and Cobalt Advanced).

In the second study Endigo ZC and Centric 40 WG manufactured by Syngenta Crop Protection were tested as experimental insecticides compared to standard products to determine effectiveness on sunflower moth larvae and other pest arthropods.

Test 1 (Planting dates 2/16 and 3/15). Numerically Prevathon (rynaxypyr) provided the highest level of sunflower moth control for both planting dates, although the level was not statistically better than the Karate and Cobalt Advanced treatments. However, the infested head percentage was statistically lower in Prevathon plots for the first planting date but not for the second planting date as compared with the other insecticide treatments. All insecticides provided a high level of control compared to the infestation levels in untreated sunflowers.

Test 2 (Planting date 3/15). The standard insecticides Karate (lambda-cyhalothrin) and Cobalt (gamma-cyhalothrin + chlorpyrifos) provided the highest level of sunflower moth larval control. Centric alone did not provide control; in fact, sunflower moth larval numbers were significantly higher in that treatment compared with all others in the test including the untreated. It appeared that the thiamethoxam (Centric) in Endigo caused a reduction in effectiveness of that treatment.

OBJECTIVES: Test 1. The test was conducted (1) to compare the effectiveness of the local standard treatment Karate (lambda-cyhalothrin) to Cobalt Advanced (mixture of lambda-cyhalothrin + chlorpyrifos) and Prevathon (rynaxypyr) for control of caterpillar pests of sunflower, (2) to determine the infestation rate on sunflower heads of sunflower moth larvae, and (3) to measure yield as affected by planting date and insecticide.

Test 2. Endigo ZC (lambda-cyhalothrin + thiamethoxam) was evaluated for efficacy on sunflower moth compared with other selected insecticides.

MATERIALS/METHODS: The studies were conducted on the Meaney Annex of the Texas A&M AgriLife Research and Extension Center at Corpus Christi, Texas. Sorghum had been grown on the site in 2011. For the study Triumph s668 dwarf oil seed hybrid sunflower seed was planted on February 16 (early date) and March 15 (late date) with a 4-row John Deere model 7300 MaxEmerge 2 VacuMeter planter. The seeding rate was 18,000/acre. Plots were 8 rows (Test 1 date of planting study) by 35 feet on 38-inch centers, and the treatments were arranged in a randomized complete block design with 4 replications. Only 4 of 8 rows were treated in the date of planting study (Test 1); whereas, in Test 2 plots were 4 rows and all 4 were treated. Test 2 was conducted only on sunflower planted on March 15.

Soil at the site was a sandy clay (50% sand, 14% silt, 36% clay) with a pH of 8.0 and 1.49% organic matter. Fertilizer applied was 64-32-0-2S-2Zn. Herbicide consisted of Treflan (32 oz/acre). Plant emergence was February 23 and March 21, respectively, for the two planting dates. The few weeds that emerged were removed by hand.

Insecticide treatments were applied April 25 (4% bloom), April 30 (20% bloom), and May 8 (100% bloom) for planting date 1 and on May 16 (15% bloom) and May 23 (100% bloom) for planting date 2. All insecticide treatments were applied with a Spider Trac sprayer calibrated to deliver 8.4 gpa total volume through 8X hollow cone nozzles (2/row) at 45 psi and at a speed of 5.0 mph.

Treatments were assessed by (1) examination of 10 sunflower heads weekly in each plot during the insecticide treatment period for insect pest activity and thereafter until samples were taken for sunflower moth larval activity, (2) collecting 5 heads/plot in Test 1 on May 22 [early planting date] and on June 4 [late planting date], and (3) collecting 10 heads/plot on May 22 in Test 2. Test 1 sunflower moth larval counts were also reported as the number/10 heads. Head samples were brought to the lab and dissected to find the sunflower moth larvae. Larvae were found by pulling bracts off, peeling seed from the head, and taking apart the head.

Agriculture Research Manager (ARM revision 6.1.13) software was used to conduct analysis of variance and means were separated by LSD (least significant difference).

RESULTS/DISCUSSION: Test 1. Prevathon (both rates), Karate, and Cobalt Advanced significantly reduced the number of sunflower moth larvae on heads for both planting dates (Table 1). Plots treated with Prevathon numerically contained fewer larvae than the other treatments; furthermore, the performance of Prevathon remained consistent for both planting dates. Percentages of infested heads were very high for both planting dates ranging from 90% (2^{nd} planting date) to 100% (1^{st} planting date). The percentage of infested heads was significantly lower in Prevathon treated plots for the first planting date, but statistical differences were not found in this factor among the insecticides in heads examined from the second planting date.

Additional studies are needed to determine if Prevathon will provide extended periods of control; subsequently, fewer treatments might be required. We expected more damage from sunflower moth larvae for the second planting date, but larval numbers were about one-third fewer in the second planting date when comparing the untreated sunflowers. The planting date comparison will remain an objective in future studies.

Yield comparison was an objective of the study, but extensive damage in spite of our best efforts to prevent the damage was caused by white-winged dove (Fig. 1). Heads will be harvested at a very high moisture content in future studies and dried under forced air to prevent almost 100% loss from this bird species. Netting was not effective in preventing the bird damage. The early harvest method was used on a cultivar comparison in a nearby test as a result of this experience.

Test 2. In this study Centric treated sunflowers contained significantly more sunflower moth larvae than all other treatments including the untreated (Table 2). Furthermore, the Endigo treatments which contain the active ingredient in Centric (thiamethoxam) were not significantly different in number of sunflower moth larvae when compared with the untreated sunflowers. It appears that increased infestation occurred when thiamethoxam was included in the mixture. Karate and Cobalt provided significantly higher level of control when compared to the untreated sunflowers, but the level of control for these two insecticides was not statistically better than the Endigo treatments. Infested head percentages were not significantly different across the treatments, but again, the highest infested head percentage was in the Centric treated plots followed by the untreated sunflowers.

ACKNOWLEDGMENTS: Thanks are extended to the National Sunflower Association for partial support of this work and to DuPont and Syngenta companies for their support. Special acknowledgment is given to Rudy Alaniz and Clint Livingston, Demonstration Assistants, for their able work in all phases of the experiments. Triumph Seed Company is thanked for providing the sunflower seed and offer of harvest equipment.

Table 1. Comparison of insecticides for effectiveness on sunflower moth larvae in sunflower, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

	Early planting date (2/16)		Late planting date (3/15)	
Treatment[1/] (oz/acre)	Larvae/ 10 heads	% infested heads	Larvae/ 10 heads	% infested heads
Prevathon 0.43 SC (10.0 oz/acre)	1.5[b]	10[c]	1.5[b]	15[b]
Prevathon 0.43 SC (14.0 oz/acre)	1.5[b]	15[c]	2.0[b]	20[b]
Karate Zeon 2.08 CS (1.92 oz/acre)	20.5[b]	60[b]	9.0[b]	40[b]
Cobalt Advanced 2.632 EW (31.0 oz/acre)	21.5[b]	75[ab]	7.0[b]	45[b]
Untreated	99.0[a]	100[a]	36.5[a]	90[a]
LSD (P = 0.05)	29.34	33.87	15.80	33.64
P > F	.0001	.0003	.0022	.0030

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Planting date 1 treatments were applied on April 25, 30, and May 8; and planting date 2 treatments were applied on May 16 and 23.

Table 2. Sunflower moth larvae in sunflower treated with insecticides, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

Treatment[1/]	Rate oz/acre	Larvae per 10 heads	% infested heads	Mite da. rating[2/]
Endigo ZC 2.06 ZC	4.0	17.8[bc]	57.5[a]	2.9[a]
Endigo ZCX 2.71 ZC	4.0	16.3[bc]	72.5[a]	3.4[a]
Centric 40 WG	3.5	65.3[a]	95.0[a]	3.8[a]
Karate Zeon 2.08 CS	1.92	10.3[c]	45.0[a]	2.5[a]
Cobalt 2.54 EC	24.7	6.5[c]	47.5[a]	2.8[a]
Untreated		33.0[b]	75.0[a]	2.0[a]
LSD (P = 0.05)		19.90	NS	NS
P > F		.0001	.0707	.4277

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Treatments were applied on May 16 and 23.
[2/]Damage ratings range from 1 = no damage to 5 = mites and heavy damage

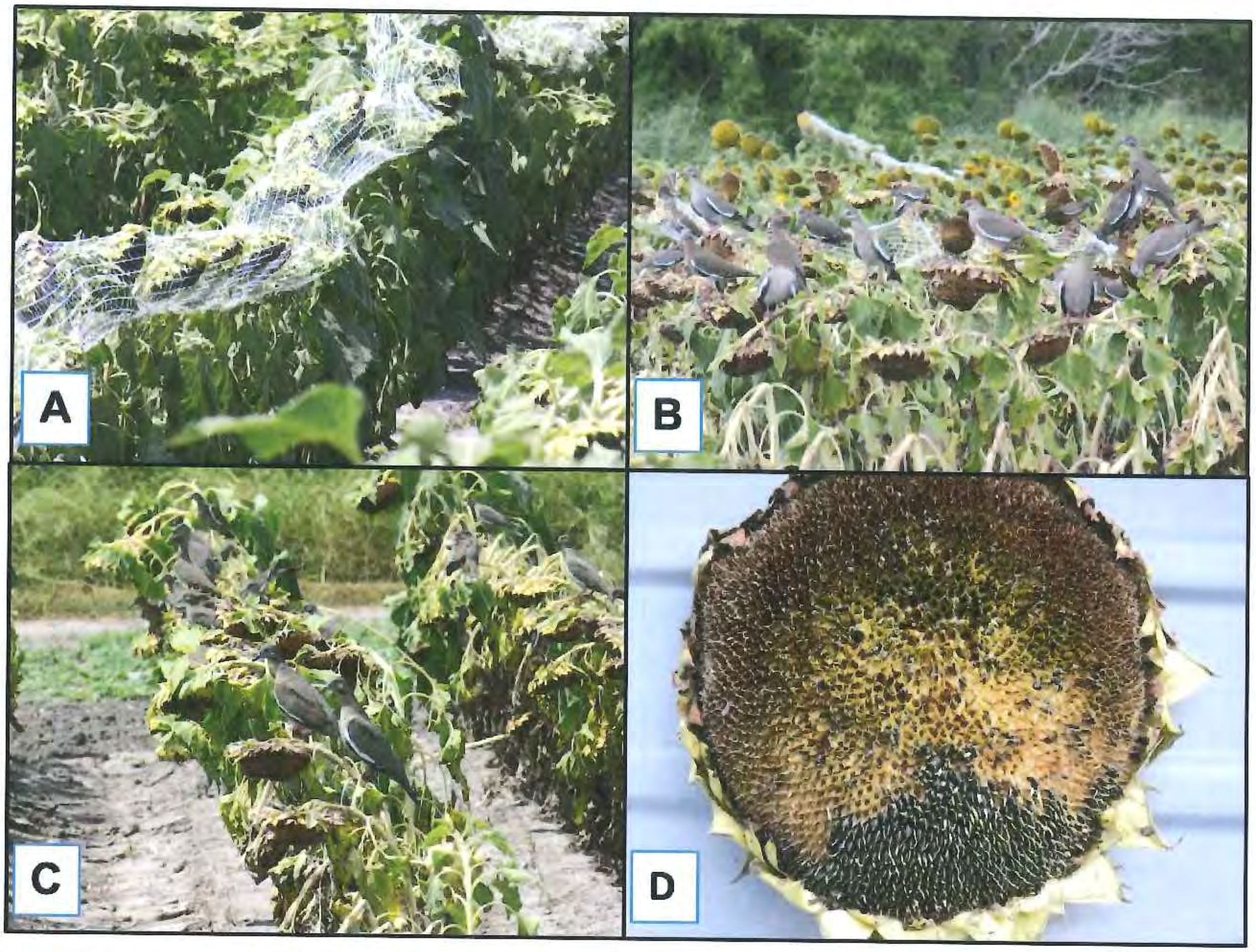


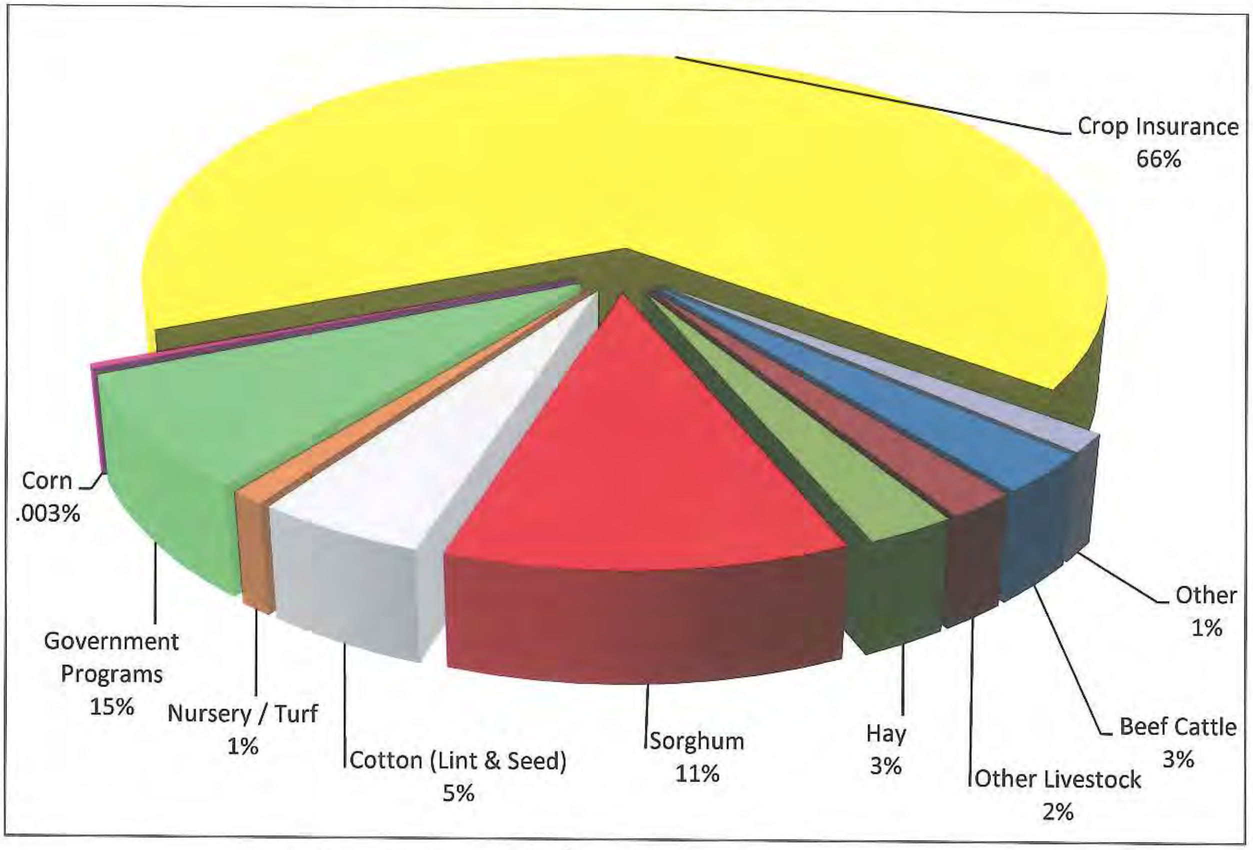
Fig. 1. Impact of white-winged dove attack on oil seed sunflower showing netting in an attempt to reduce damage (A), density of birds (B&C), and damage (D).

APPENDIX

Page #

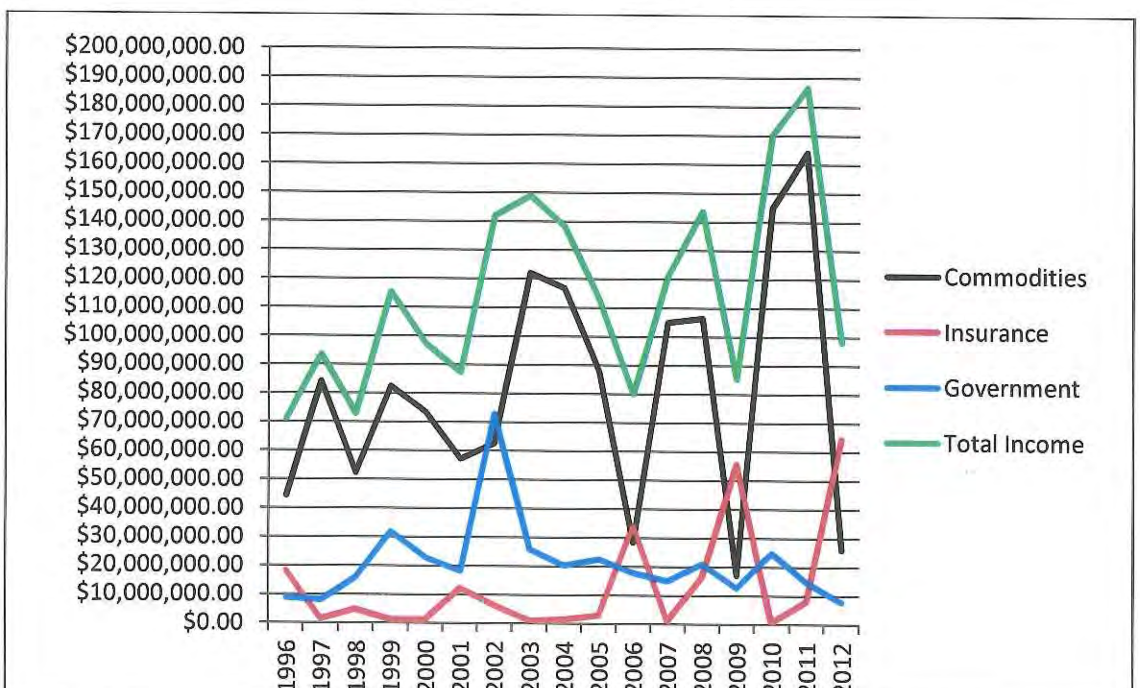
2012 Nueces County Agricultural Income

Total Income = $98,062,000



Historic Agricultural Income*

Nueces County, Texas



*This estimated income includes commodity sales, government subsidies and crop insurance.

NUECES COUNTY
ANNUAL AGRICULTURAL INCREMENT REPORT

Compiled By:
Jeffrey R. Stapper - County Extension Agent-Ag/NR

{Estimated County Cash Receipts in $1,000's}

Commodity	2007	2008	2009	2010	2011	2012
Wheat	744.70	1596.60	718.30	1366.70	494.20	194.60
Corn	3208.50	900.00	237.60	3828.40	4444.60	321.00
Hay	5580.00	1065.50	568.80	6875.00	1960.00	2520.00
Sorghum	39103.70	61178.20	6468.10	48181.70	54125.10	11264.00
Cotton	44168.80	26645.30	725.90	66679.40	76103.70	3386.00
Cottonseed	8154.20	8966.30	216.90	11507.90	16193.70	1335.00
Sunflowers	55.60	468.70	178.20	223.10	460.00	271.00
Sesame			734.20	269.00	73.90	146.00
Foodcorn	0.00	0.00	243.60	0.00	0.00	0.00
Vegetables	2.00	5.60	2.00	5.00	5.00	5.00
Nursery	1010.00	1435.00	1148.00	1400.00	1200.00	1000.00
Other Ag Related	53.50	371.20	0.20	0.00	367.80	387.50
Poultry	5.30	15.50	154.30	151.50	180.90	199.30
Milk Total	0.00	0.00	0.00	0.00	0.00	0.00
Milk Cows	0.00	0.00	0.00	0.00	0.00	0.00
Beef Cattle	2016.00	2732.80	3696.50	2209.50	4414.00	2766.80
Goats	82.50	67.40	421.50	413.00	448.00	473.60
Hogs	106.80	67.80	634.40	691.70	660.80	770.00
Sheep	31.00	13.50	156.80	184.20	177.00	219.80
Aquaculture	200.00	200.00	200.00	200.00	120.00	200.00
Horses	360.00	300.00	300.00	300.00	300.00	300.00
Hunting	130.00	130.00	130.00	130.00	130.00	130.00
TOTAL	**105012.60**	**106159.40**	**16935.30**	**144616.10**	**161858.70**	**25889.60**

NUECES COUNTY ROW CROP PRODUCTION - 10-YEAR OVERVIEW

GRAIN SORGHUM

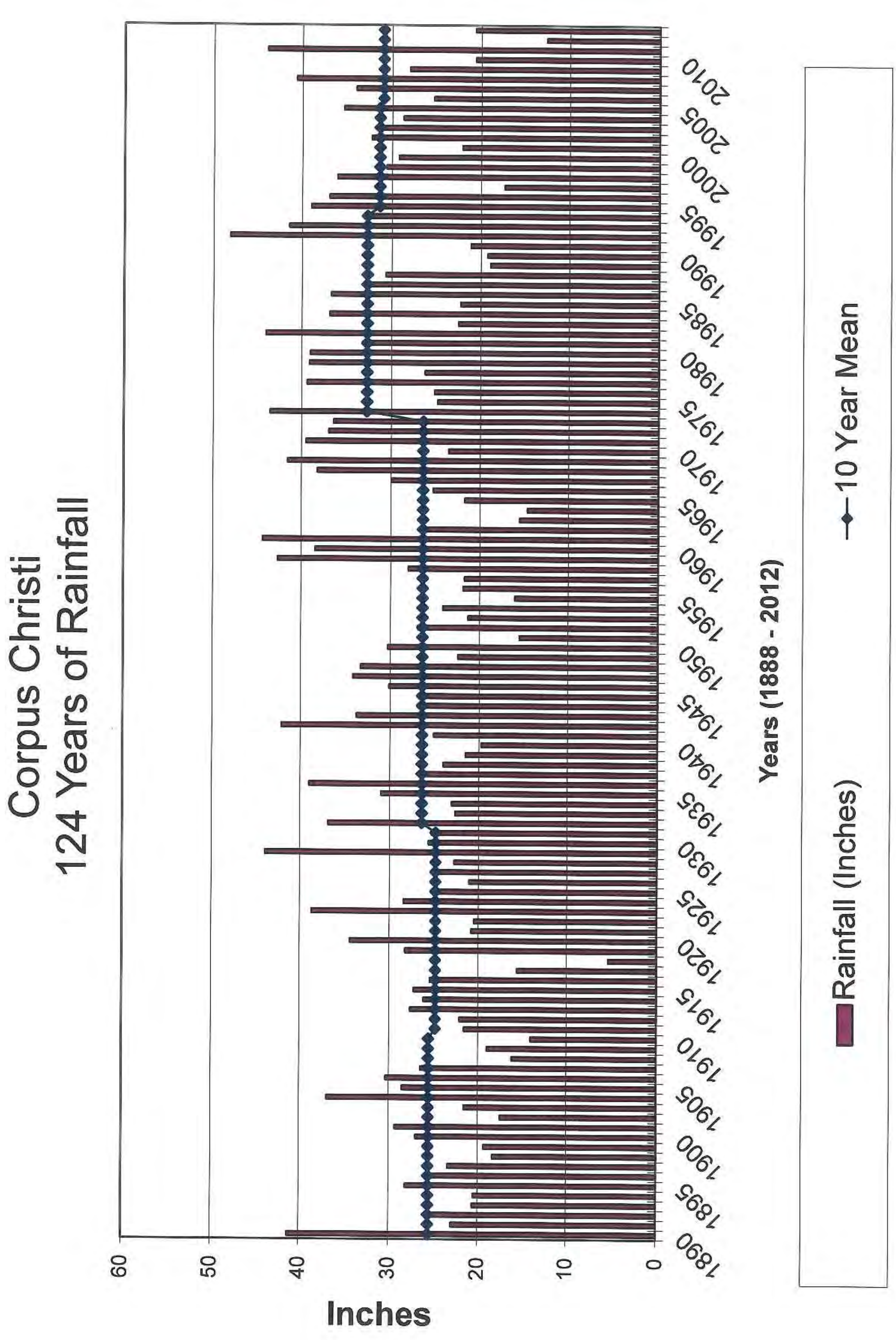
YEAR	PLANTED	ACRES HARVESTED	POUNDS/ACRE	TOTAL (CWT)
2003	181,300	179,800	3,670	6,598,660
2004	165,066	163,500	4,600	7,521,000
2005	160,000	157,300	3,350	5,264,000
2006	158,700	92,400	1,568	1,473,000
2007	187,000	186,100	4,200	7,816,200
2008	198,850	197,880	3,797	7,513,504
2009	168,211	49,800	2,240	1,115,520
2010	183,430	183,430	4,730	8,676,239
2011	141,867	141,867	4,730	5,390,946
2012	187,196	58,292	1,800	1,049,256
10-Yr Avg	**173,162**	**141,037**	**3,469**	**5,241,833**

COTTON

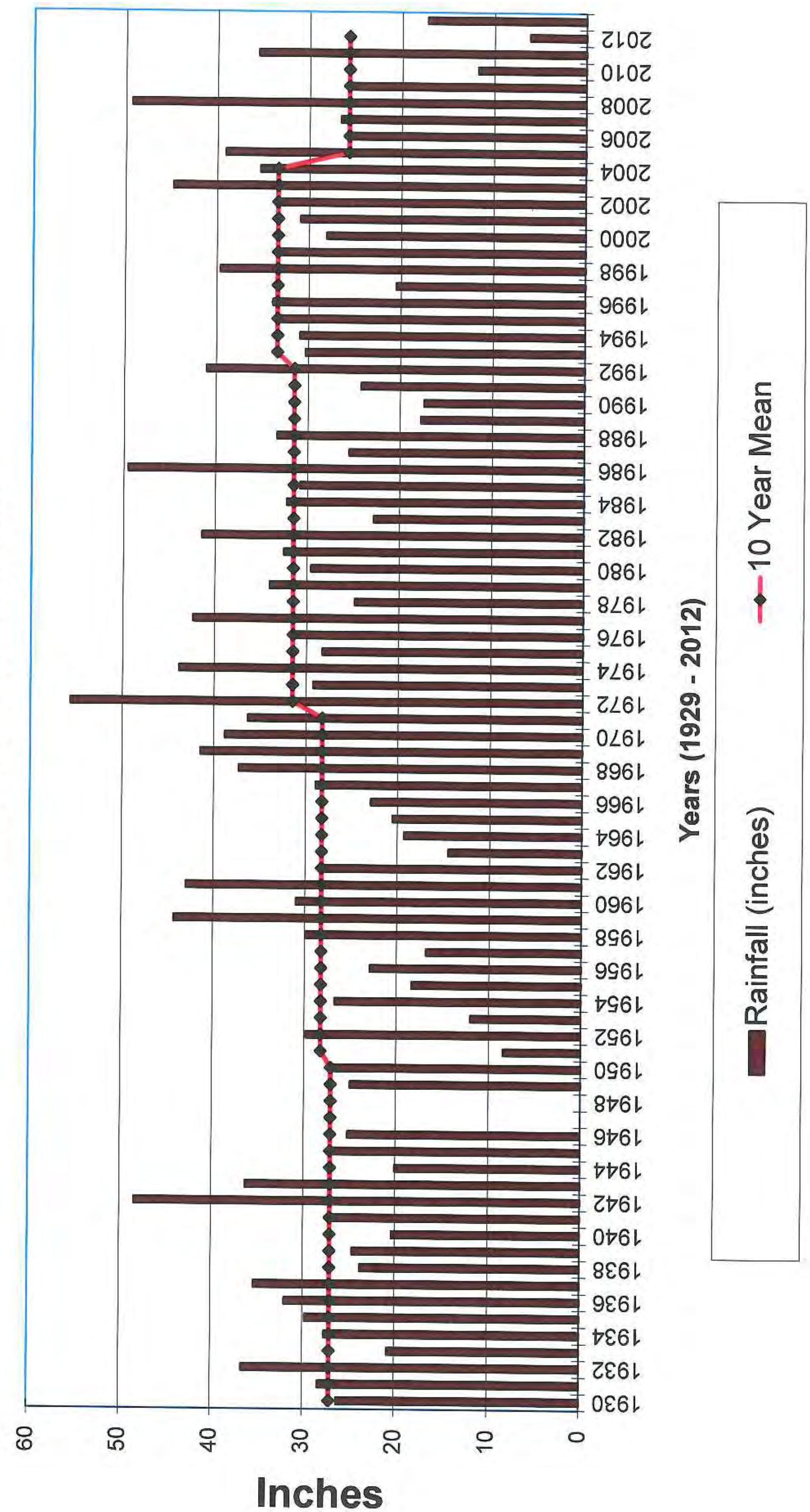
YEAR	PLANTED	ACRES HARVESTED	POUNDS/ACRE	TOTAL (Bales)
2003	132,800	132,600	1,050	278,460
2004	142,970	141,600	870	246,384
2005	145,100	142,900	552	157,762
2006	175,900	54,500	562	61,258
2007	110,300	109,900	917	201,557
2008	111,649	81,649	518	84,588
2009	125,790	4,116	360	2,963
2010	104,050	104,050	866	187,721
2011	130,840	111,527	669	155,441
2012	112,793	12,820	372	9,935
10-Yr Avg	**129,219**	**89,566**	**674**	**138,607**

CORN

YEAR	PLANTED	ACRES HARVESTED	BUSHELS/ACRE	TOTAL (Bu)
2003	12,800	12,000	64	768,000
2004	7,513	7,450	105	782,250
2005	7,700	7,600	51	387,600
2006	3,700	1,700	69	117,300
2007	10,300	10,000	86	860,000
2008	5,500	5,383	50	269,150
2009	9,309	2,313	25	57,825
2010	9,867	9,867	97	957,022
2011	12,400	12,400	58	719,200
2012	3,167	1,529	30	45,870
10-Yr Avg	**8,226**	**7,024**	**63**	**496,422**


Corpus Christi
124 Years of Rainfall
Inches
60
50
40
30
20
10
0
1890
1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
Years (1888 - 2012)
Rainfall (Inches)
10 Year Mean

Robstown
83 Year of Rainfall



AGRICULTURAL INFORMATION SOURCES

Nueces County Extension Agents Agriculture/Natural Resources
710 E. Main, Suite 1; Robstown, TX 78380
Phone: 361/767-5223 Fax: 361/767-5248
Web Address: http://nueces.agrilife.org/
E-mail: nueces-tx@tamu.edu

Texas A&M AgriLife Research and Extension Center
Corpus Christi A&M Research and Extension Center
10345 State Hwy 44; Corpus Christi, TX 78406-9704
Physical Location: Hwy 44, 4 miles West of CC Airport

Farm Service Agency
548 S. Hwy 77, Suite A; Robstown, TX 78380
361/387-2533

Natural Resources Conservation Service
548 S. Hwy 77, Suite B; Robstown, TX 78380
361/387-2533

Cotton Classing Office/USDA AMS - Corpus Christi
3545 Twin river Boulevard; Corpus Christi, TX 78410
Phone: 361.241.4001 Fax: 361.241.0133

Texas Department of Agriculture - Austin
Pesticide Applicator Certification Division
(regulatory information and pesticide enforcement)
PO Box 12847; Austin, TX 78711
512-475-1675 TELL-TDA 1-800-835-5832

TEXAS A&M AGRILIFE EXTENSION