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PEANUT BREEDING AND TESTING

M.D. Burow, M.R. Baring, C.E. Simpson, Y. Lopez, J. Ayres,
and J.M. Cason

Collaborators: M.A. Black, J.L. Starr and A.M. Schubert

SUMMARY

The most important information from the Peanut Breeding Program for this year is that we have submitted two lines for Variety Release – a large seeded high O/L Spanish line and a high O/L runner line that has good resistance to TSWV and *Sclerotinia*. We had twenty-five (Burow 10, Baring 10, Simpson 5) test sites for breeding and testing plots in 2005, and most sites began the crop season with sufficient moisture from rainfall and/or irrigation for land preparation and planting. Most planting in West and Central Texas was on a timely basis but record cold temperatures occurred in mid-April, and peanuts already planted in West Texas were significantly delayed in emerging. This delay in emergence did not appear to have a detrimental effect on growth of the plants, nor yield. From June through harvest some sites experienced some brief periods of rainfall, but in total, the summer was hot and dry. One test site in Terry County was lost due to a 10 inch rainfall event approximately 2 weeks post emergence. In the final analyses, many areas finished the growing season with record low rainfall amounts. Test plots in Stephenville required a record 20 inches of irrigation, raising considerable concern about the cost of production for commercial farming operations. Our plot yields in some tests were exceptional, and we were able to gather some valuable yield data, evaluation results, seed increases and generation advances. We were pleased with plot yields above 6000 pounds per acre in five sites and some plot yields above the 7400 pound range in plots in at least two locations; Erath and Gaines (south) Counties. Seed increase of our Spanish high O/L variety, OLin, has been accomplished and limited quantities of OLin should be available for Certified planting seed in 2006. Our yield data continue to indicate that OLin will probably be slightly lower yielding than Tamspan 90 but still has the potential to produce well over 5000 pounds of pods per acre, a very acceptable yield for an early maturing variety. Also, recent *Sclerotinia* disease ratings indicate that OLin has better resistance than Tamspan 90.

Our first runner high O/L variety, Tamrun OL 01 has performed well in South and West Texas and has not appeared to suffer any ill effects in the market place because of 1:1 ratio of jumbo to medium seed. The other high O/L runner, Tamrun OL 02, was available in limited quantities for 2005, but seed quantities should be better for 2006, with seed available for significant commercial production. Yields continue to be very good for both varieties and the O/L of both varieties is well above the normal range. Processor complaints about hard kernels seem to be coming on peanuts grown in the northern part of our area. We are working to identify the source of the hard seed trait so

we can initiate selection efforts to eliminate the trait from future variety releases. Data gathered so far indicate that Tamrun OL 02 is lower in hard seed than Florunner.

The "new" seed increase of NemaTAM, our second root-knot nematode resistant variety, was very successful in 2005, and there should be enough seed to plant approximately 800 acres in 2006. New nematode resistant lines which have high O/L and TSWV resistance are being tested, but are still three years away from the farmer, at best.

Breeding populations have been built and/or evaluated in studies on early maturity, multiple disease resistance, and leaf spot resistance. As part of another project, we anticipate developing molecular markers to use in selecting within these populations.

INTRODUCTION

The hot, dry summer months of 2005 re-emphasize that we must develop peanut varieties that will have a broad genetic base so they have the potential to perform well in many environmental conditions. We have proposed to release two lines that are a step in the direction of helping the Texas peanut growers stay in business. Mild summer temperatures in 2004 were expected to result in peanut plants that were smaller, with seed that was not mature. The hot temperatures of 2005 were expected to cause problems of flavor and quality of the peanut crop. However, in both years peanut plants appeared to grow to normal size, with fruiting, growth and maturation progressing very well, and the Texas peanut crop was a good one in both years, with almost opposite weather conditions. The hot dry, year of 2005 resulted in additional costs in irrigation, but the dry and hot conditions reduced outbreaks of *Sclerotinia* and leafspot. However the heat and dry conditions did not prevent the proliferation of tomato spotted wilt virus in South Texas.

Advanced Spanish Lines

In 2005 we had seven advanced-lines Spanish yield tests with 17 breeding lines and three check varieties planted at seven locations. The test at Stephenville was the only site that had disease screening as a major objective. As mentioned previously, one of the Terry County test sites was lost due to erosion from excessive rainfall, and the only other real setback for any of these locations was due to disease pressure from diseases other than *Sclerotinia* being so great that we were unable to get definitive *Sclerotinia* disease ratings from the test.

The Spanish O/L 1 tests included 17 advanced Spanish lines and three check varieties; OLin, Tamspan 90, and Spanco. **Table 1** shows the yield data for the top performing lines at four West Texas sites located in Gaines, Terry, and Lamb Counties.

The test average yield for 3 of the four locations shown on **Table 1** were over 5100 lbs./ac. The Lamb County location 2 was in a tight soil and had hail damage 3 weeks post-emergence resulting in lower overall performance of the lines.

Line Tx034342 was in the top statistical grouping for all four locations. Line Tx029055 has been one of the highest yielding lines in our tests, however, blanching data indicated poor blanchability characteristics. Several other lines also performed well, but were lacking in one characteristic such as seed size, %TSMK, yield stability, etc. or another. Tx034342 had the best overall performance and characteristics across the three years of yield testing from 2003 through 2005.

Table 1. Yields for the top performing lines in the Spanish O/L #1 yield tests at four West Texas sites in 2005.

Entry	Terry County	Gaines County	Lamb County 1	Lamb County 2
Tx029055	6507a	4977d-f	5638a-c	3912a
Spanco	6451ab	5554a	5038de	3572b-f
Tx034343	6422a-c	5377a-d	5466b-d	3675a-d
Tx029013	6410a-c	5365a-d	5456b-d	3476c-g
Tx034244	6271a-c	5032b-f	5446b-d	3507c-f
Tamspan 90	6069a-d	5495ab	5562a-c	3363e-g
Tx034342§	6032a-d	5145a-f	5509a-d	3800ab
Tx034208	5934a-d	5473a-c	5475b-d	3589b-f
Tx034337	5904b-d	5256a-e	5736ab	3323fg
OLin	5616d	5124a-f	4924e	3213g
Mean	5999	5127	5299	3449
CV%	7.1	6.4	6.3	5.6
LSD	599	467	486	276

Means followed by the same letter are not significantly different by Fisher's LSD ($p \leq 0.05$).
§Line Tx034342 has been proposed for release as a large seeded Spanish line with seed characteristics that will enable it to be used like a runner peanut, while maintaining a Spanish maturity.

Proposed Release of line Tx034342.

We have proposed to release a large seeded Spanish line that has the potential to bridge the gap between the present day late maturing runner varieties and the "new generation" early maturing runner varieties of the future. The process of developing an early maturing, high yielding runner that has good flavor components, good seed size, shape and size distribution, and will yield at an acceptable level, is a long term project. In the meantime it was suggested to us that a large seeded Spanish with maturity two to four weeks earlier than runners might be something that would benefit both the farmers and the processing/manufacturing industry. Therefore, after testing lines already available in the program, we are increasing seed in Puerto Rico this winter in anticipation of an approval to release the breeding line Tx034342 as a new variety.

Yield testing across West Texas counties from 2003 through 2005 have proven that there is no difference between line Tx034342 in terms of yield and grade when compared to other Spanish varieties. However, there is a significant difference in seed size as line Tx0343432 has seed size and distribution similar to the Florunner variety.

Tables 2 and **3** show test data from Terry County and Lamb County, respectively over the 2004 and 2005 growing seasons. The only differences detected were in the seed weight in which line Tx034342 was significantly heavier than either Tamspan 90 or OLin.

Table 2. Performance of line Tx034342 as compared to the check varieties Tamspan 90 and OLin in Terry County for 2004 and 2005.

	2004 Yield Test			2005 Yield Test		
Entry	**Lbs/ac**	**%TSMK**	**100sd/wt.**	**Lbs/ac**	**%TSMK**	**100sd/wt.**
Tx034342	6784a	75.6a	64.3a	6032a	61.8ns	58.4a
Tamspan 90	6643a	75.8a	49.1c	6069a	63.9	45.3c
OLin	6460a	75.3a	55.6b	5616a	66.8	51.2b

Means followed by the same letter are not significantly different by Fisher's LSD ($p \leq 0.05$).

Table 3. Performance of line Tx034342 as compared to the check varieties Tamspan 90 and OLin in Lamb County fro 2004 and 2005.

	2004 Yield Test			2005 Yield Test		
Entry	**Lbs/ac**	**%TSMK**	**100sd/wt.**	**Lbs/ac**	**%TSMK**	**100sd/wt.**
Tx034342	4554ns	71.9ns	54.5ns	5562a	72.7b	59.5a
Tamspan 90	4761	72.6	53.7	5509a	74.9ab	45.4b
OLin	4441	73.4	52.5	5508a	75.5a	49.2b

Means followed by the same letter are not significantly different by Fisher's LSD ($p \leq 0.05$).

Maturity testing using the hull-scrape method has determined that line Tx034342 has a maturity similar to that of Spanish varieties and earlier than that of the runner variety Florunner. Data in **Table 4** shows that Line Tx034342 had maturity equal to Tamspan 90 across 6 tests. Also, data from 4 sites revealed that Tx034342 was significantly earlier maturing than the runner variety Florunner.

Table 4. Tx034342 maturity as compared to the Spanish varieties Tamspan 90 and Olin and as compared to the runner variety Florunner.

Entry	%Maturity for 6 tests	%Maturity for 4 tests
Tx034342	80.1%a[1]	89.1%a[2]
Tamspan 90	79.2%a	85.3%a
OLin	76.5%b	86.1%a
Florunner		45.8%b

Means followed by the same letter are not significantly different by Fisher's LSD ($p \leq 0.05$).

[1] Maturity comparisons across two years from six tests.

[2] Matutity comparisons across two years from four tests.

Advanced Runner Lines

In 2005 we also had an advanced runner line test that included 15 advanced breeding lines and 5 runner check varieties; Tamrun 96, Tamrun OL 01, Tamrun OL 02, Florunner, and Flavorrunner 458. This test was conducted at 3 South Texas sites, 2 West Texas sites, and 2 Central Texas sites. Data from **Table 5** reveal the yields for the top five performing lines and the checks at four of the seven locations.

Table 5. Yields for the top performing lines and check varieties from the Advanced Line Tests in 2005.

Entry	South Gaines	North Gaines	Frio (TSWV)	Erath
Tamrun 96	7466a	6305a-f	3116ef	7645a-d
Tx034139	7442a	5996e-h	1360g	6639e-g
Tx033609	7396ab	5736f-h	3953a-c	7302a-f
Tx044221	7376a-c	5857e-h	3297c-f	7159a-f
Tamrun OL 01	7372a-c	6611a-c	3583a-f	7981a
Flavor. 458	7256a-d	6687ab	979g	7139a-f
Tamrun OL 02	7203a-d	6403a-e	3375b-f	7729a-c
Tx033630	6902a-d	6430a-e	4059ab	7817ab
Florunner	6881a-d	6835a	1563g	6987b-g
Tx034145	6875a-d	6009d-h	3284c-f	6810c-g
Mean	6896	6135	3241	6981
CV%	6.6	7.0	15.3	8.2
LSD	641	611	704	942

Means followed by the same letter are not significantly different by Fisher's LSD ($p \leq 0.05$).

The average yield for three of the four test sites was over 6100 lbs/a, and the fourth site was lower due to a high incidence of tomato spotted wilt virus in our TSWV screening nursery. Yields at the Frio County nursery were also lower due to high temperatures at flush flowering (101°F+ for two weeks straight), which prevented good pod set.

Several of the breeding lines performed equal to the check varieties. Line Tx033630 which is being proposed for release, performed equal to the widely grown Flavorrunner 458 variety in North and South Gaines County and in the disease-free nursery at Erath County. It performed superior to the Flavorrunner 458 variety at the TSWV nursery in Frio County with a yield of 4059 lbs/a as compared to Flavorrunner 458 which yielded 979 lbs/a.

Michael Baring has been working on selection techniques to develop multiple disease resistant varieties in his Masters of Science research problem. In his work he has selected runner peanuts that had excellent TSWV resistance, very good *Sclerotinia* tolerance, and excellent yield potential. The line, mentioned above in the advanced line test, identified as Tx033630 was one the lines from his Masters work and has been proposed for release as a high O/L, multiple disease resistant runner-type peanut.

Line Tx033630 was tested in 23 tests across 9 locations from 2002 through 2005. One test site is at the program's tomato spotted wilt nursery located in Frio County, in South Texas. Disease pressure was severe at this location in 2004 and 2005. Data from the two years were combined and are located in **Table 6** Line Tx033630 performed superior to the check varieties yielding 1149 lbs./a to 2798 lbs./a higher. It also graded equal to Tamrun OL 01 and Tamrun OL 02 while grading superior to the popular Florunner and Flavorrunner 458 varieties. The seed weight for this line was smaller than Tamrun OL 01 and larger than Tamrun OL 02, Florunner, and Flavorrunner 458.

Disease ratings indicate that Tx033630 performed better than the recently released Tamrun OL 01 and Tamrun OL 02 with a 23.8% infection rate compared to 58.8% and 55% respectively. The widely grown Flavorrunner 458 variety had an infection rating of 74.1%.

Table 6. Combined analysis from 2004 and 2005 at the tomato spotted wilt nursery in South Texas.

Genotype	Lbs./acre	%TSMK	Value/$	100sd.wt.(g)	TSWV %
Tx033630	**4862a**	**73.4a**	**942a**	**64.9b**	**23.8a**
Tamrun OL 01	3713b	72.1a	668b	69.1a	58.8b
Tamrun OL 02	3131bc	71.7a	632b	60.6c	55.0b
Florunner	2917c	69.5b	593b	57.1d	53.3b
Flavorrunner458	2064d	68.9b	422c	53.2e	74.1c

Means followed by the same letter are not significantly different by Fisher's LSD (p=0.05).

Tests were also conducted at the peanut program's *Sclerotinia minor* nurseries. Data from six tests were combined from two locations over three years (**Table 7**).

Line Tx033630 had the highest yield when compared to the check varieties. The line yielded from 432 lbs./a to 1507 lbs./a higher than all four checks. The grades were not different between any of the lines. Once again the seed weight for Tx033630 was smaller than Tamrun OL 01 and larger than the other three varieties.

Disease ratings revealed that Tx033630 had a lower percentage of infection at 34.1% as compared to the four checks, the best of which was Tamrun OL 01 with 46.0% infection.

Table 7. Combined analysis for six tests from 2002 through 2004 at two *Sclerotinia minor* nurseries.

Genotype	Lbs./acre	%TSMK	Value/$	100sd.wt.(g)	Disease %
Tx033630	**2402ab**	**68.2ns**	**412a**	**60.0a**	**34.1ab**
Tamrun OL 01	1970bc	66.0	324b	62.8a	46.0bc
Tamrun OL 02	1032d	73.0	177c	56.9b	50.0cd
Florunner	895d	75.2	163c	54.5b	71.7d
Flavorrunner458	1709c	65.8	279b	50.5c	60.7de

Means followed by the same letter are not significantly different by Fisher's LSD (p=0.05).

Data from the West Texas growing region which included six tests from 2002 through 2005 were combined (**Table 8**). All of the sites were disease-free which lead to high mean yields for all of the lines. Tx033630 had a mean yield of 6539 lbs./a but was not different from any of the check varieties. The grade for Tx033630 was slightly lower than Flavorrunner 458 and Florunner, but equal to Tamrun OL 02 and slightly higher than Tamrun OL 01. Seed size for Tx033630 was again smaller than Tamrun OL 01 and larger than the other check varieties at 77.7 g/100 seed.

Table 8. Combined analysis for six test across three west Texas locations from 2002 through 2005.

Genotype	Lbs./acre	%TSMK	Value/$	100sd.wt.(g)
Tx033630	**6539ns**	**76.0c**	**1221bc**	**77.7b**
Tamrun OL 01	6510	74.8d	1173c	82.2a
Tamrun OL 02	6693	75.6c	1249b	72.9c
Florunner	6811	77.8b	1302a	70.5d
Flavorrunner458	6625	78.7a	1271ab	68.0e

Means followed by the same letter are not significantly different by Fisher's LSD (p=0.05).

Uniform Peanut Performance Test (UPPT)

Three locations of the 2005 UPPT runner/Virginia test were conducted in Texas; one each in Northwest, South, and Central Texas. The sites were the Peanut Research Farm on the J. Leek Farm in Terry County, the Bennet farm in Frio County, and Texas Agricultural Experiment Station in Erath County. A total of fifteen breeding lines plus two check cultivars, Florunner and NC-7, made up the multi-state test. The breeding lines tested included five Virginia and ten runner lines. The runner lines were submitted as follows: Georgia – 2 lines, Peanut CRSP – 2 lines, Florida – 3 lines, Texas – 3 lines. The Virginia type lines were submitted from Georgia (1). North Carolina (3), and Virginia (1). We also added some local checks, including Tamrun OL 01, Tamrun OL 02, and Flavorrunner 458. Other local checks were added at the West Texas site (Table 1).

The data from the three tests are summarized in **Table 9**. We think the differences in environment were too great to average the three locations together into one analysis, so individual test data are shown. In the Terry County test yields were in the "very good" range, with all but one entry greater than 5000 lbs. per acre. Surprising to us, some of the later maturing lines, runners and Virginias, were among the top yielders in the test and, under no disease, Florunner and its derivative Flavorrunner 458 continued to excel. The same was true for the South Texas test in that the later maturing runners and some Virginia lines were at the top of the test. It is significant to note that in both disease affected tests, Central and South Texas, Flavorrunner 458 and Florunner did not perform well. Also, under tomato spotted wilt virus pressure, Tamrun OL 01 and Tamrun OL 02 did not do well in South Texas, but both varieties did well in the Central Texas nursery where TSWV was not a problem, but sclerotinia definitely was a factor.

Table 9. Uniform Peanut Peformance Tests- Three Texas Locations

Terry County-Leek Research Farm

Cultivar	Value/A	Lbs./A	TSMK%	100sd/g
UF04327	1308a	6720a	75.0e-g	85.3ef
UF03326	1300a	6640ab	75.5d-f	85.1e-g
VT003069	1293a	6610ab	76.4c-e	112.7a
GA012534	1267ab	6344a-d	77.0b-d	89.9de
Florunner	1250ab	6553a-c	78.1a-d	69.6k-m
GA011568	1250ab	6504a-d	78.9ab	73.2jl
Flav. 458	1247ab	6419a-d	79.9a	68.3lm
GA011514	1233a-c	6147a-e	77.6bc	78.6h-j
T-OL-01	1202a-c	6188a-e	75.6d-f	81.7f-h
UF03325	1188a-d	5864d-f	78.2a-c	79.7g-i
TX033630	1186a-d	6190a-e	78.1a-c	75.0i-k
NC7	1177a-d	6206a-e	74.1f-h	108.4ab
N01013T	1147b-e	6018b-e	73.2gh	102.3c
TX034145	1147b-e	6046a-e	78.1a-c	81.4f-h
CRSP14	1143b-e	5588ef	77.2b-d	75.5ij
TX033607	1140b-e	6000b-e	77.4b-d	67.4m
T-OL-02	1106c-e	5915c-f	77.0b-d	74.2i-k
N02006	1061de	5598ef	72.5h	105.4bc
N03090T	1031ef	5244fg	74.6e-g	95.1d
CRSP08	905f	4612g	75.0e-g	74.4i-k
MEAN				
CV%	8.0	7.9	1.9	4.7
LSD	133.4	676.6	2.0	5.6

Frio County-Pearsall, Texas

Cultivar	Value/A	Lbs./A	TSMK%	100sd/g
N01013T	1101a	5638ab	74.6ab	91.3c
UF04327	1076ab	5921a	73.9a-d	71.6d-f
UF03326	1003a-c	5526a-c	73.7a-d	68.8e-g
GA011568	985a-c	5303a-d	75.7a	65.3f-h
VT003069	968a-d	4862c-e	76.3a	105.5a
UF03325	936b-e	5102b-e	74.5ab	71.4d-e
NC7	935b-e	4977b-e	71.9b-e	101.2ab
N03090T	923c-e	4944b-e	71.0de	97.1bc
GA011514	922c-e	4923c-e	76.4a	63.1gh
Tx034145	916c-e	4944b-e	75.2a	72.5de
Tx033630	904c-e	5107b-e	71.8b-e	63.6gh
N02006	900c-e	4763de	71.8b-e	105.6a
T-OL-01	882c-e	5180b-e	70.7ef	70.7d-e
GA012534	875c-e	4818c-e	74.3a-c	77.5d
T-OL-02	822d-f	4689de	71.0de	60.4hi
Florunner	822d-f	4511ef	73.5a-e	58.5hi
Tx033607	813ef	4591de	71.5c-e	55.1i
Flav. 458	702fg	3801fg	74.5ab	56.1i
CRSP14	565gh	3184gh	71.9b-e	61.6hi
CRSP08	433h	2547h	67.9f	60.8hi
MEAN	875.0	4768.0	73.1	74.1
CV%	12.0	10.5	2.8	6.5
LSD	150	715	2.9	6.9

Erath County-Stephenville, Texas

Cultivar	Value/A	Lbs./A	TSMK%	100sd/g
Tx034145	1158a	6066a	77.9a	73.0e
Tx033607	1016b	5404a-c	76.2ab	55.6k
T-OL-02	1006bc	5533ab	74.1a-d	63.5g-i
Tx033630	1002bc	5332bc	76.6ab	67.8e-h
GA011514	997b-d	5307bc	77.4a	63.5g-i
CRSP-14	996b-e	5394a-c	75.0a-c	69.4e-g
T-OL-01	976b-f	5326bc	74.9a-c	69.6ef
GA011568	908b-g	4801cd	77.3ab	60.3i-k
UF-03326	897b-g	4907b-d	74.2a-d	70.5ef
N-02006	881c-i	4617d	73.1b-e	92.9ab
UF-03325	865d-i	4602d	76.1ab	66.2f-i
GA-12534	863e-i	4400d-g	74.9a-d	82.1d
Florunner	851f-i	4569de	75.1a-c	56.9jk
N-03090T	829g-j	4500d-f	70.6c-f	89.7bc
UF-04327	771h-k	4537de	69.7ef	68.8e-g
NC-7	757i-k	3910e-h	74.0a-d	94.5ab
VT003069	757i-k	3844f-h	76.0ab	96.5a
N-01013T	702jk	3815f-h	71.1c-f	83.8cd
Flav. 458	680kl	3723gh	73.9a-e	56.9jk
CRSP-08	548l	3325h	66.8f	62.4h-j
MEAN	873.44	4696.0	74.2	72.2
CV%	9.2	8.9	3.5	5.1
LSD				

Means followed by the same letter are not significantly different by Fisher's LSD (p≤0.05).

Drought Testing

We began testing conditions for drought tolerance at the J Leek farm, and tested the Texas Tech Farm in Lubbock again this year. In 2004, the large amount of rainfall made accurate testing impossible. Our goal was to use 75% evapotranspiration replacement for full irrigation, and 50% ET replacement for drought conditions. This treatment has usually given a 25% reduction in yield. Four runner and Virginia lines were planted in replicated twin row plots at three spacings, and yield measured at harvest. As can be seen in **Tables 10 and 11**, the irrigation treatments succeeded in reducing yield, but to different extents. At the J. Leek Farm, yield was reduced 9% overall, although 11% at standard plant spacing (data not shown). At the TTU Farm, yield overall was reduced 22%, 30% at the standard spacing. The results show that the applied irrigation was close to the target at TTU, but application methods need to be reviewed for the J. Leek Farm. It can be seen that drought conditions reduced maturity, seed size, and shellout at the TTU Farm. Statistically-significant differences in these traits were not observed at the J. Leek Farm, except for seed size, which increased slightly under drought.

The conditions will be used in the future for setting up tests of breeding lines under normal and deficit irrigation as part of an effort to develop varieties that grow well under reduced irrigation.

Table 10. Comparison of Yield at the J. Leek Farm in 2005 under full and reduced irrigation.

Irrigation	Value/ac	LbPod/ac	%BlkBr	G100SMK	%TSMK
75%ET	1064a	5688a	33.66ns	80.1b	76.09ns
50%ET	976b	5151b	36.57	81.7a	76.69

Table 11. Comparison of Yield at the Texas Tech Farm in 2005 under full and reduced irrigation.

Irrigation	Value/ac	LbPod/ac	%BlkBr	G100SMK	%TSMK
75%ET	859a	4739a	32.11a	77.94a	73.97a
50%ET	668b	3711b	19.03b	74.63b	72.88b

The *Sclerotinia* screening nursery in Erath County was inoculated as before, but, due to weather conditions the inoculation procedures were not as successful as needed for good screening data.Ratings were given to individual plots on a scale of 0=no disease symptoms to 10=total plant death. Just as the Sclerotinia was beginning to develop, allowing us to make some definitive ratings, we had a hard freeze and all plants were killed back to the point that ratings were not possible.

Sclerotinia Resistance and Improved Grades

Crosses between Tamrun 98 (high grade, *Sclerotinia* resistance) and several of our breeding lines including Tamrun OL 01 and Tamrun OL 02 were made in 2002 in an effort to increase grade performance and the level of Sclerotinia resistance of Tamrun 98. One hundred fifty individual F_2 plant selections were made under heavy *Sclerotinia* pressure in 2003. Each individual selection was analyzed for O/L ratio and lines with high O/L were planted under *Sclerotinia minor* pressure for further selection in 2004. A total of 34 lines were identified as having high O/L ratios and disease ratings as good as or better than the check varieties. Seed from these lines were increased in 2005 and will be yield tested under TSWV pressure, *Sclerotinia* pressure, and the West Texas environments in 2006.

Root-knot Nematode Resistance

In our continuing our effort to incorporate the root-knot nematode resistance into multi-resistant and high O/L lines through a backcrossing program we yield tested twelve new lines that were winter increased in Puerto Rico in Nov 04 to April 05, at four locations – one without nematodes, one lightly infected, and two moderately to heavily infested with RK nematodes. Since this is the first year of test of these lines, we do not think it is justified to show a table of all four tests. Line PR 2 and PR 6 were equal to the checks in yield and grade, but unfortunately we only had enough seed for three tests of these two lines so they were only tested at one location under nematode pressure. In that test (Keith Farm) PR 6 was 138% higher in yield than Tamrun 96 and 29% higher than NemaTAM. The PR 2 line was 128% above Tamrun 96 and 24% higher than NemaTAM. Other of the 12 PR lines had high yields, but the red seed coat color from the US 224 source of Sclerotinia and TSWV resistance is segregating from these lines and selection will have to be done to purify the lines to a consistent tan seed coat. Twenty-eight other lines were also increased in the Stephenville field plots and will need to be yield tested in 2006. Also, we are seed increasing 65 lines in the greenhouse at present and these will be harvested and replanted in the field in 2006 in an effort to have sufficient seed for testing in 2007. Almost all of these lines have been developed in the past three to four generations by using the molecular markers for the nematode resistance gene. We anticipate that we will have at least one line good enough to release in late 2007 that has TSWV, RK nematode, and sclerotinia resistance, with the high O/L genes. We anticipate releasing two or three of the sister lines of NemaTAM as Germplasm lines in the future. The usefulness of these lines as breeding material lies in the very consistent higher TSMK counts and/or higher yields.

Breeding for Higher Yields using Wild Species Derived Hybrids

Due to the nature of breeding for disease resistance, the majority of work done in the breeding program is done through backcrossing. The backcross method is excellent for the introgression of individual traits such as a particular disease resistance or for example the high O/L trait while maintaining all of the other desirable characteristics of a variety. However, the method is not conducive to promoting significant increases in yield, but rather maintaining the original yield characteristics.

A crossing program was initiated in 2004 using high yielding wild species derived hybrids from Simpson's program at Stephenville. The goal was to increase yield potential in the multiple disease resistant lines that have already been developed. Two hundred F_1's were increased in the 2004 nursery and produced approximately 20,000 F_2's for evaluation in 2005. The F_1 generation plants exhibited hybrid vigor in that they were larger than either of the parents and typically out-yielded the parents on an individual plant basis. Selections from the resulting 20,000 F_2's were made based on individual plant yield, growth habit, and pod characteristics. Several of the F_2 generation individual plant selections yielded between 850 and 1000 seeds per plant.

ACKNOWLEDGMENTS

We express our sincere appreciation to the Texas Peanut Producers Board and thus, the Texas Peanut Producers, for assisting our program again in 2005. A large part of the work reported here would not have been possible without this generous support.

We also acknowledge the support of our several cooperators and collaborators. We especially thank James Overstreet & Bennet Partnership, Murray Phillips, and Brad Easterling (IPM), Frio County; Otis Lee Johnson and Jeremy Grissom, Gaines County; Andy Timmons, Terry County; Don Keith, Erath County; Scotty Koonce, George Bingham, and CEA Bob Whitney, Comanche County; Haldon Messamore and Brad Heffington, Lamb County, and James Grichar, and the entire staff at the Yoakum Research Station.

TPPB FINAL REPORT
March 15, 2006

Subject Area: Peanut Breeding
Title: Breeding for Quality Peanut - Maturity, Oil, and Sugar Content
Personnel and Agency:

Mark D. Burow, Charles E. Simpson, Yolanda López, Michael R. Baring, Mark Black, A. Michael Schubert, John Cason, and Jamie Ayers.

This proposal involved several important but diverse aspects of the breeding program. It included funds for evaluation of advanced lines at additional sites; we included Central and South Texas to test for disease resistance. For quality traits, we measured oleic: linoleic ratios on seeds of a large number of breeding materials at early stages of development, or on single seeds of advanced materials to identify high-oleic seeds to advance to the next generation. We also worked on setting up instruments to measure sugar content at an early stage of the breeding program. These efforts were distinct from an award from the National Peanut Board that allowed us to send large samples of a few advanced lines to J. Leek for a more-detailed quality analysis that included flavor characteristics. We also ran a Spanish/Valencia UPPT test for obtaining quality information on these market types, increased sublines of two varieties for testing for the hard kernel trait, and tested advanced backcrosses with Spanish breeding lines.

(1) Evaluation of advanced populations. We had requested funds to evaluate advanced populations at additional locations, especially for disease resistance. The $F_{2:7}$ runner and bunch lines evaluated in West Texas were evaluated also in Erath and Frio counties for resistance to Sclerotinia blight and tomato spotted wilt virus.

F2:7 Runner and Bunch Populations

At Stephenville, unlike other locations, separate runner and bunch tests were conducted, with a total of 30 and 20 entries (including checks), respectively. Runner and bunch selections from 2004 were not pooled into one combined experiment because there were not enough seed to plant all entries in 2004.

Sclerotinia incidence was spotty, and disease ratings given for 2005 were based on percentage diseased plants. Many plots did not show any damage. However, both *Sclerotinia minor* and *Aspergillus niger* were present, and so the data reflect both of these diseases. Because of the limited disease pressure and the combination of diseases, we did not obtain much useful data on Sclerotinia resistance in 2005. Sclerotinia pressure was not higher because of warm, dry weather late in the season, and because peanuts had not been grown in this field recently.

Results on runner lines were not consistent with the previous year, which could be expected because the disease situation was different. In 2004, where there was considerable Sclerotinia pressure, entry 13 was the highest-yielding accession, with a disease rating (1 to 10 scale, 10 = dead) of 3.5. In 2005, this entry did not yield as well as others. This was the only entry at Stephenville that was one of the top entries at the J. Leek farm (#17 there; entry numbers do not correspond between Stephenville and the other locations because of the different numbers of entries at Stephenville) that had evidence of resistance to Sclerotinia in 2004; however, the lack of seed meant that many lines were not evaluated then. As a consequence, these lines need to be evaluated again in 2006 to get a good set of Sclerotinia ratings.

Table 1. F2:7 Runner Test -Stephenville, Erath Co. - 2005												
Entry	ValAc		LbPodAc		G100SMK		PctTSMK		PctELK		PctDisease	
Tx966205	471	a	2591	a	60.4	b-g	74.2	ab	18.4	b-f	0.0	c
Tx972505	411	ab	2252	a-e	58.3	d-h	74.8	ab	14.9	c-h	0.0	c
Tx977235	409	ab	2264	a-d	56.2	d-h	73.2	a-c	4.9	kl	0.0	c
9	389	a-c	2367	ab	56.9	d-h	66.4	d-g	12.1	f-i	0.0	c
30	384	a-d	2285	a-c	69.3	b-d	68.4	b-e	20.6	bc	0.0	c
10	376	a-d	2234	a-e	63.0	b-g	68.7	b-e	19.4	b-e	0.0	c
11	338	b-e	2135	a-e	67.3	b-f	66.4	d-g	20.2	bc	0.0	c
Florunner	337	b-e	1784	b-f	58.9	c-h	76.5	a	9.6	h-k	0.0	c
17	324	b-e	1769	b-f	67.4	b-f	74.8	ab	14.0	d-h	0.0	c
20	295	c-f	1650	e-g	72.2	bc	72.9	a-c	16.2	c-g	0.0	c
12	291	c-f	1700	c-g	56.6	d-h	69.9	b-e	18.3	b-f	0.0	c
13	290	c-f	1678	d-g	60.7	b-g	70.4	a-d	14.2	d-h	0.0	c
18	274	d-g	1519	f-h	62.5	b-g	73.2	a-c	10.1	g-k	3.3	bc
8	258	e-g	1648	e-g	46.2	h-j	60.7	gh	2.1	l	0.0	c
7	251	e-h	1676	d-g	40.2	ij	58.1	hi	1.0	l	0.0	c
25	249	e-h	1391	f-i	54.6	f-h	73.3	a-c	6.3	i-l	0.0	c
21	236	e-i	1356	f-j	56.9	d-h	70.4	a-d	14.0	d-h	0.0	c
NC-7	209	f-j	1111	g-m	95.9	a	72.6	a-d	43.8	a	0.0	c
15	198	f-j	1209	f-j	61.1	b-g	66.3	d-g	11.4	g-j	0.0	c
23	196	f-j	1155	g-l	57.8	d-h	67.9	c-e	13.1	e-h	0.0	c
29	163	f-j	976	h-n	41.0	ij	67.6	c-e	14.4	d-h	6.7	b
27	143	h-k	907	k-n	54.7	f-h	63.9	d-g	4.3	kl	6.7	b
16	128	i-k	844	k-n	66.3	b-f	61.0	f-h	12.3	f-i	3.3	bc
28	111	jk	650	k-n	56.0	e-h	67.9	c-e	5.8	j-l	6.7	b
19	107	jk	760	k-n	34.7	j	53.1	i	0.0	l	0.0	c
24	107	jk	526	m-o	50.5	g-i	68.6	b-e	4.4	kl	3.3	bc
26	102	jk	578	l-o	72.8	b	71.8	a-d	23.8	b	0.0	c
14	72	k	444	n-o	62.9	b-g	67.1	c-f	6.0	i-l	3.3	bc
22	n.d.		138	o	n.d.		n.d.		n.d.		8.3	b
BSS 56	n.d.		124	o	n.d.		n.d.		n.d.		18.3	a
Mean	237		1391		55.4		64.0		11.8		2.0	
LSD	114		609		13.3		6.3		6.5		5.9	
CV%	24.3		24.9		12.6		5.2		26.6		176.2	

Data on bunch lines is still being analyzed.

TSWV resistance.

The combined runner/bunch F2:7 population was grown in Frio country for evaluation of resistance to TSWV (Table 2.) The TSWV data are based only on the early (September) evaluation, as the materials were early-maturing and were senescing by the time of the October rating. Only entries 24 and 29 could be said to have any tolerance to TSWV. Unfortunately, entry 29 did not yield well at any location, and entry 24 was competitive only in Frio country, and yielded less than the best check. Any early-maturing accessions that are to be developed into varieties will need to be backcrossed by TSWV-tolerant germplasm to be capable of being grown in South Texas.

Table 2. F2:7 Runner/Bunch - Phillips Farm - Pearsall, Frio Co. - 2005										
	ValAc		LbPodAc		G100SMK		PctTSMK		PctSW	
TX01F5415	727	a	3785	a	53.65	d-f	74.12	a	11.36	ab
TamrunOL02	634	ab	3706	ab	65.65	bc	70.26	ab	4.17	a
24	497	bc	3124	b	82.45	a	65.06	a-f	19.44	a-c
08	372	cd	2324	c	38.40	i	53.76	h-j	23.61	a-d
Florunner	370	cd	1902	c-e	55.60	de	68.98	a-c	30.56	a-e
NC7	309	de	2004	cd	85.05	a	67.01	a-d	40.91	a-f
29	268	d-f	1891	c-e	55.30	de	58.96	d-i	11.62	b-g
23	253	d-g	1556	d-f	83.80	a	64.10	b-g	50.00	b-g
21	235	d-h	1509	d-f	69.00	b	65.94	a-e	38.89	b-h
14	234	d-h	1650	d-f	51.45	d-h	57.84	d-i	33.33	c-i
22	213	d-i	1569	d-f	59.85	cd	57.22	e-j	47.22	d-j
16	205	d-i	1359	e-h	54.55	d-f	62.68	b-h	34.72	d-j
17	201	e-i	1269	f-i	49.55	e-h	59.46	c-i	43.06	e-k
13	152	e-j	1195	f-j	46.20	f-i	50.10	ij	42.68	f-k
20	132	f-j	1161	f-k	56.90	de	54.92	g-j	50.00	g-k
Spanco	121	f-j	986	g-l	43.10	hi	56.16	f-j	69.44	g-l
09	118	f-j	992	g-l	49.00	e-h	49.96	ij	55.56	g-l
10	115	f-j	836	h-n	54.25	d-f	53.00	ij	45.58	g-l
30	111	f-j	864	h-m	39.45	i	50.94	ij	27.78	g-l
25	111	f-j	743	i-o	54.54	d-f	56.24	f-j	42.80	g-m
15	103	f-j	876	h-l	40.00	i	51.64	ij	59.60	h-m
28	95	g-j	653	j-o	49.20	e-h	53.22	h-j	57.20	i-m
07	92	g-j	1004	g-l	49.90	e-h	48.26	j	33.33	i-m
18	91	g-j	788	h-o	50.65	e-h	57.36	e-j	48.61	j-n
27	70	h-j	579	k-o	67.60	bc	57.62	d-j	66.67	k-n
12	55	ij	486	l-o	70.15	b	58.24	d-i	70.83	m-o
11	28	j	256	nn	44.70	g-i	50.70	ij	76.39	m-o
26	28	j	269	m-o	40.25	i	36.80	k	52.78	no
19	26	j	199	o	52.90	d-g	50.78	ij	81.94	no
BSS56	25	j	415	l-o	53.65	d-f	36.69	k	72.22	o
Mean	200		1332		55.56		56.60		44.74	
LSD	168		596		8.67		9.58		20.83	
CV%	41.0		27.4		7.6		8.3		28.5	

(2) Measurement of oleic: linoleic (O/L) ratios on early-maturing lines. The goal was to identify lines that had the high-oleic trait, and that could be advanced. In all, we tested about 3,800 samples for oil composition. These results were used for several experiments:

Testing of oil composition in F2 populations. We had grown 10 F2 populations each of 300 individuals in 2004. The best 3 populations based on visual appearance were selected for advancement. Approximately 100 F2 plants were selected from each population, based on yield, maturity, and O/L ratio. These were grown in 2005 as F2:3 rows. These were harvested, and we have yet to take measurements on these populations.

Identification of high-oleic plants from the Spanish x Valencia populations. These populations had several Spanish and Valencia lines that are potential candidates for release, but these are segregating for seed coat color and O/L ratio. Seeds from the best lines were selected for seed coat color (tan for Spanish, red for Valencia) and O/L ratio. These are being increased for planting in the summer of 2006.

Identification of high-oleic plants from the Spanish x high-O/L runner selections for backcrossing. The best lines from 2003 and 2004 data were selected for increase and backcrossing. We paid special attention to pod shape and O/L ratio. Pods with good shape were selected and shelled, and high-O/L seeds were planted for backcrossing to high-O/L lines to combine the high-O/L trait, earliness, yield, and disease resistance.

Early-maturing runner lines backcrossed to high-oleic runners. We have planted progeny of crosses between the high-yielding, early-maturing runner lines (tested in 2001 -2003) x high-O/L varieties. Some of the progeny have been tested for the high-O/L trait, and others remain to be tested. The goal is to add the high-O/L trait, better shelling, and some resistance to Sclerotinia and TSWV. We planted materials that, after harvest, would allow us to plant up to 201 BC_1F_2, 540 $BC_1F_{2:3}$, and 29 $BC_1F_{2:4}$ accessions in 2006.

(3) Sugar analysis. We have received a relatively-new HPLC (high-pressure liquid chromatograph) from the Texas Tech Plant and Science Dept. to use for measuring sugar content. We were not able to repair the older one, as wiring schematics were not available and the manufacturer does not support it anymore. The newer HPLC has been set up at the TAES-Lubbock Center, and will be used to help us in selecting lines with appropriate sugar levels at an earlier stage of varietal development. In addition, the TTU Plant and Soil Science Dept. purchased an NMR (nuclear magnetic resonance spectrometer) to use for measuring total oil content in oilseed crops. This could be useful for checking the oil contents of breeding lines at early stages of development.

(4) Spanish/Valencia UPPT Test. We grew the Spanish/Valencia Uniform Peanut Performance Test again in addition to the runner/Virginia UPPT test at the J.Leek Research Farm (Table 3). This is to allow comparison of Spanish varieties under development to standard checks, and obtain quality data on a limited number of accessions at no additional cost.
The entries consisted primarily of five large-seeded Spanish lines that were under consideration for release. Entry Tx034342 was eventually selected for increase (see the TPPB Breeding and Genetics 2005 reports for more information.) This line was statistically similar in value per acre, yield, and maturity to the other Spanish lines and checks in the test. It shelled as well as the other breeding lines, although not as well as the checks in this experiment. This line had a larger seed size that was more-appropriate for runner peanuts.

Table 3. Uniform Peanut Performance Test - J.Leek Farm- Terry County 2005

Genotype	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK		PctELK	
Spanco	979	a	5562	a	86.50	a	52.60	de	72.19	b	10.84	e
Tx029055	961	ab	5485	a	89.17	a	59.60	a	71.64	bc	15.69	b
OLin	956	ab	5239	ab	78.50	a	50.25	e	74.60	a	10.54	e
Tx034204	938	a-c	5367	a	84.50	a	55.25	c	71.37	bc	11.55	de
Tx034337	936	a-c	5361	a	82.00	a	58.05	ab	71.67	bc	14.62	b-d
Tamspan90	924	a-c	5071	ab	85.50	a	45.33	f	74.49	a	2.33	f
Tx034208	892	a-c	5145	ab	83.50	a	55.93	bc	71.04	bc	22.30	a
Tx034342	874	a-c	5133	ab	82.00	a	58.03	ab	69.87	c	20.42	a
NMValC	842	bc	4656	b	87.50	a	53.75	cd	71.21	bc	12.24	c-e
H&W136	812	c	4622	b	64.42	b	60.30	a	70.28	bc	14.93	bc
Mean	911		5164		82.36		54.91		71.84		13.55	
LSD	130		700		12.97		2.42		2.20		3.13	
CV%	9.8		9.4		10.9		3.0		2.1		15.9	

(5) Hard-seeded trait.

We have begun the process of looking for the source of the hard-seeded trait. We planted and harvested component lines of Tamrun 96, and single plants of Tamrun OL01. Germination on the Tamrun 96 sublines was poor, and increase will need to be repeated. Samples have yet to be run to identify which sublines are prone to this trait and which are not.

(6) Testing of BC5 Spanish lines with the large-seeded trait.

The goal of this is to test lines that have been backcrosses by Tamspan 90 for additional generations, to select for lines that yield better than or equal to Tamspan 90. The test was grown at the J. Leek farm (Table 4) and at the Brian Patterson farm near Springlake (Table 5). None of the entries were superior to Tamspan 90 for yield, value, or maturity, but entries 14, 9, and 11 were statistically equal to Tamspan 90 at both locations. Further testing is needed to determine whether any of these lines offer any advantage to the large-seeded accession being increased for release as Tamnut 06.

Table 4. Spanish OL3 test - J.Leek Research Farm - Terry Co. - 2005

Entry	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK	
03	959	a	4911	bc	73.9	a-d	55.4	hi	76.0	a
14	940	ab	5387	ab	74.0	a-d	59.0	b-f	71.6	a-c
Spanco	934	ab	5511	a	78.7	a-c	53.8	i	69.9	bc
Tamspan90	902	a-c	5034	a-c	88.7	a	46.5	k	73.5	ab
02	897	a-c	5114	ab	76.0	a-d	56.3	g-i	71.9	a-c
09	877	a-c	5143	ab	75.3	a-d	61.8	a	69.9	bc
11	874	a-c	5123	ab	71.3	a-d	59.1	b-e	70.2	bc
06	873	a-c	4960	a-c	72.7	a-d	48.0	jk	72.1	a-c
01	872	a-c	5010	a-c	77.7	a-d	60.3	a-c	71.7	a-c
15	871	a-c	5002	a-c	76.7	a-d	60.1	a-c	71.0	bc
OLin	864	a-d	4919	bc	62.7	cd	49.9	j	71.7	a-c
07	859	a-d	5186	ab	68.0	b-d	56.5	f-h	67.9	c
04	854	a-d	4878	bc	80.7	a-c	61.0	ab	71.6	a-c
08	850	a-d	4826	bc	83.3	ab	59.9	a-d	72.3	a-c
13	849	a-d	4970	a-c	76.0	a-d	59.5	a-e	70.3	bc
12	837	b-d	4874	bc	77.9	a-d	57.4	d-h	70.7	bc
16	831	b-d	4886	bc	76.7	a-d	58.2	c-g	70.8	bc
10	796	cd	4800	bc	68.7	b-d	58.7	b-g	68.1	c
05	752	de	4482	cd	64.9	cd	57.2	e-h	70.7	bc
UF435	655	e	3907	d	60.5	d	49.0	jk	68.5	c
Mean	857		4946		74.22		56.38		71.02	
LSD	115		589		18.08		2.60		4.95	
CV%	7.9		7.1		14.7		2.8		4.2	

Table 5. Spanish OL3 Test - Brian Patterson Farm - Lamb Co. - 2005

	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK	
07	964	a	5664	a	56.62	c-f	53.73	c-g	69.79	a
11	943	a	5546	ab	54.67	d-f	53.63	d-g	69.42	a
13	940	a	5401	a-c	71.33	a-c	56.20	a-d	70.99	a
Tamspan90	933	a	5209	a-e	67.33	a-d	44.20	k	73.43	a
03	912	a	5359	a-d	54.67	d-f	51.10	gh	69.54	a
14	899	ab	5120	a-e	74.00	ab	55.70	a-e	71.71	a
09	891	ab	5115	a-e	63.14	a-e	57.13	a	71.32	a
OLin	879	a-c	4983	b-f	50.67	ef	45.63	jk	72.20	a
Spanco	868	a-c	5015	b-f	64.00	a-e	48.70	hi	70.72	a
02	866	a-c	5205	a-e	42.73	f	52.30	fg	67.72	abc
12	859	a-c	4932	c-f	79.33	a	52.30	fg	71.00	a
01	858	a-c	4857	c-f	59.33	b-e	55.90	a-d	72.42	a
08	858	a-c	5019	b-f	52.00	d-f	56.50	a-c	69.74	a
04	842	a-c	4800	d-f	62.00	b-e	55.90	a-d	71.69	a
05	819	a-c	4983	b-f	48.00	ef	54.23	b-f	67.26	abc
10	816	a-c	4849	c-f	48.67	ef	53.80	c-g	68.28	abc
16	797	a-d	4740	ef	60.00	b-e	52.90	e-g	69.07	ab
06	733	b-d	5173	a-e	53.33	d-f	47.30	ij	57.21	c
UF435	712	cd	4441	f	14.00	g	44.87	jk	64.71	abc
15	644	d	4625	ef	52.67	d-f	56.67	ab	57.56	bc
Mean	852		5052		56.42		52.43		68.79	
LSD	171		586		16.47		2.85		11.65	
CV%	12.1		7.0		17.7		3.3		10.2	

Acknowledgments. We express our sincere appreciation to the Texas Peanut Producers Board and the Texas Peanut Producers for assisting our program again in 2005. A large part of the work reported here would not have been possible without this generous support. A large part of our work in this and other projects was done at the J. Lee Farm, and we would like to thank the Texas Peanut Producers Board for making arrangements so that we were able to use this farm. We would also like to thank our cooperators and collaborators, including Brian Patterson (Lamb County), and Murray Phillips (Frio County).

ACI/Texas Peanut Producers
Cooperator Report 2005

Dow AgroSciences LLC, DAS, and AgResearch Consultants Inc., ACI, entered into a Cooperator agreement February 4, 2004. The purpose of the agreement was to extend the life of the Flavor Runner trait through the continuation and further development of the Flavor Runner peanut breeding program.

In the 2005 growing season, breeding lines from the Flavor Runner peanut breeding program were planted in West Texas. Principal objective was to develop a high yielding, high oleic, early maturing peanut variety.

2005 Texas Planting

On 4/20/2005, 459 breeding line plots were planted on the Birdsong Peanut farm adjacent to the Birdsong shelling plant near Brownfield, Texas. Also at this site, were planted a replicated yield trial of lines selected the previous year, seed increases of selected Flavor Runner lines, and F_1 seed from crosses with Flavor Runner and Flavor Runner lines. Also, a yield test of elite lines was planted in Gaines County, south and west of Seminole.

The week after planting there were two weeks of low temperatures and a nine inch rain event at the Brownfield location. Emergence was slow and sporadic. Eventually, there was complete emergence. However, because of the variation emergence, the maturity data may not be representative of a normal year. A repeat of the maturity evaluation will be conducted in the 2006 crop year.

Texas Variety Tests

For the second year, WT03-0051 and WT03-0048 were the top lines in the Brownfield variety test (Table 1). Both lines were also higher grading than the check variety, Flavor Runner 458 (Table 2). In 2004, these lines were high in jumbo kernels, which was not desirable to shellers. In 2005, the jumbo kernel % was within an acceptable range for southwest production. Year to year variation in size is normal. It will be necessary to record the variation over years to determine the average size of these lines.

In the Gaines county test (Table 3), WT03-0051 and WT03-0048 were the top runner lines in the test. Gregory, a Virginia market type, was the only variety that yielded higher. Both of the tests will be repeated in 2006.

Table 1.

Brownfield Variety Test

Entry	*Count*	*Sum*	*Variance*	*Average*	*lbs/acre*
WT03-0051	4	68.5	5.90	17.13	6216
WT03-0048	4	67	2.25	16.75	6080
WT04-0144	4	66.5	4.23	16.63	6035
Flavor Runner 458	4	65.5	4.23	16.38	5944
WT04-0142	4	65.5	8.40	16.38	5944
Brantley	4	65	4.42	16.25	5899
M04-0213-5	3	48	9.00	16.00	5808
Anorden	4	63.5	2.40	15.88	5763
WT04-0025	4	63.5	0.73	15.88	5763
WT04-0051	4	61	1.75	15.25	5536
WT04-0052	4	59	1.42	14.75	5354
WT04-0010	4	58.5	8.73	14.63	5309
WT03-0033	3	43.5	5.25	14.50	5264
WT04-0046	4	57	8.25	14.25	5173
M04-0211	4	56	2.17	14.00	5082
WT04-0121	4	55.5	1.73	13.88	5037
WT04-0056	4	52.5	10.56	13.13	4764
Gregory	4	52	12.00	13.00	4719
WT04-0023	4	51	3.42	12.75	4628
WT03-0023	4	50	14.50	12.50	4538
Andru II	3	33	1.75	11.00	3993
WT04-0088	3	25	11.08	8.33	3025

Texas Peanut Variety Test Grades

Entry	**Total Kernels**	**Jumbos**	**Mediums**	**No. 1's**	**Other**
	%	%	%	%	%
WT04-0144	74.96	51.07	43.97	1.97	2.99
WT04-0121	76.32	30.48	64.07	3.85	1.60
M04-0213	75.44	40.67	55.01	2.81	1.51
WT04-0051	76.62	38.16	56.72	3.45	1.67
WT04-0025	77.18	47.21	49.52	1.43	1.84
WT04-0142	76.36	72.47	25.01	0.92	1.60
WT04-0010	75.18	47.17	48.68	2.00	2.15
WT04-0052	75.90	39.82	55.60	3.37	1.21
WT03-0048	76.00	51.90	38.80	6.50	1.63
WT03-0051	75.00	54.80	33.60	6.70	2.18
Flavor Runner 458	73.00	54.80	35.00	4.20	2.10

Table 3

Gaines County Test

Entry	*Count*	*Sum*	*Variance*	*Average*	*lbs/acre*
Gregroy	4	83.25	0.72	20.81	7555
WT03-0051	4	80.00	3.04	20.00	7260
WT03-0048	4	79.75	0.43	19.94	7237
OL 02	4	77.50	8.69	19.38	7033
Flavor Runner 458	4	76.50	5.35	19.13	6942
Brantley	4	75.50	3.19	18.88	6852
Anorden	4	67.00	24.92	16.75	6080
Andru II	4	61.00	6.63	15.25	5536

Some varieties had the appearance of early maturity when evaluated using the hull scrape method of maturity determination. The category white 1 of the hull scrape is the most immature and the category black 6 is most mature. In figure 1, WT03-0051 and WT03-0048 are compared with Flavor Runner 458. Both of the experimental lines show more pods in the black categories that Flavor Runner 458 and WT03-0048 has more black pods than WT03-0051. This is one year and one location of hull scrap maturity data and must be repeated in 2006 and at additional locations. In figure 2, three other experimental lines are compared with Flavor Runner 458 and results indicate those lines to be earlier maturing. Again, this will be repeated in 2006.

Figure 1.

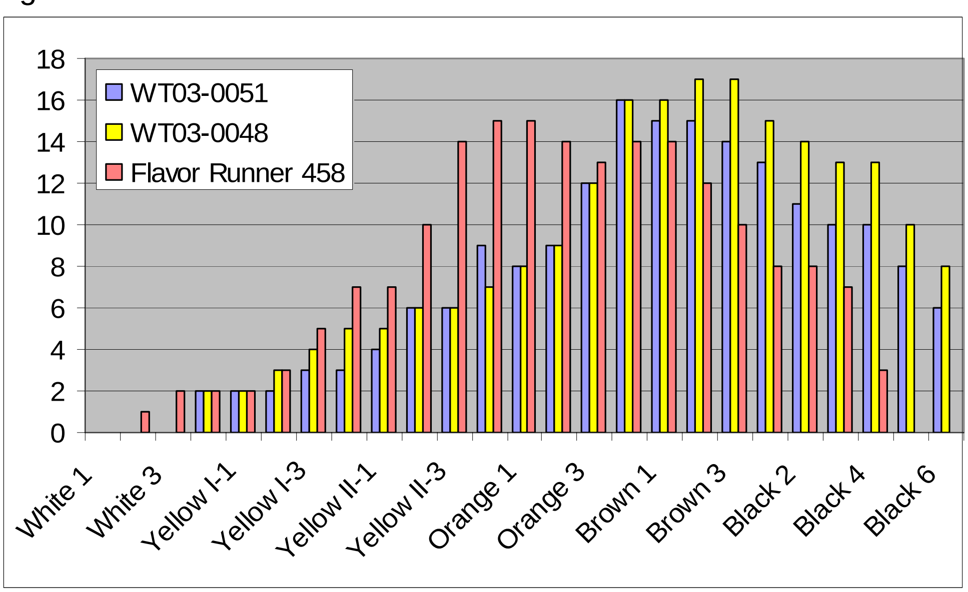
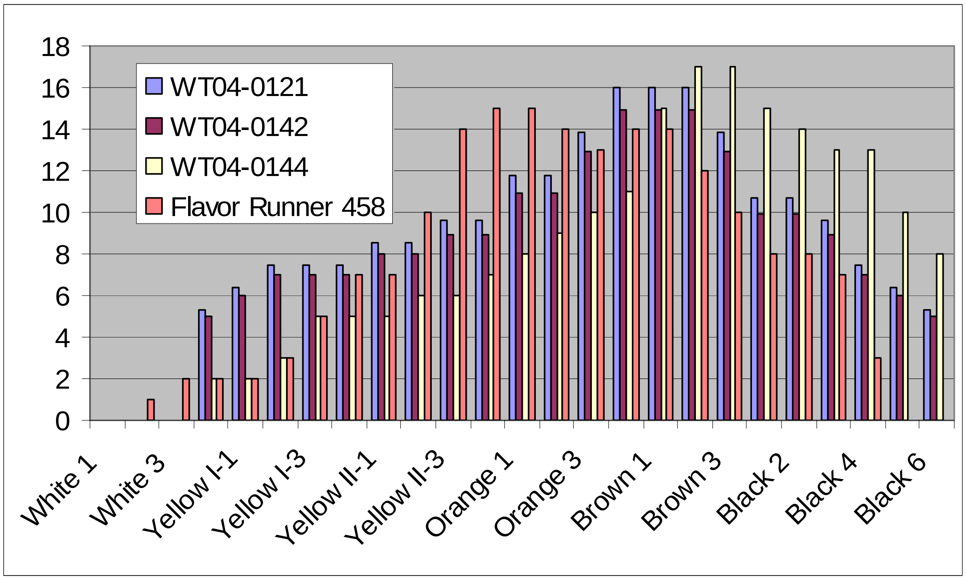


Figure 2.



Breeding line plots at the Birdsong farm near Brownfield, Texas 2005

2005 Texas selections and uniform lines

In 2005, breeding lines were planted at the Birdsong farm near Brownfield, Texas. Breeding lines consisted of single plant selections from 2004 and F_1's from crossing in 2004 (Table 4. Crossing list). In addition, some early maturing plant introductions from the national peanut germplasm collection were planted for increase. A complete list of the plots and plot maps is available.

Table 4

Cross Number	Year	Parent	Parent	Purpose
		A	B	
04-001	2004	Flavor Runner 458	M03-0045	High oleic and disease resistance
04-002		Flavor Runner 458	M03-0194	High oleic and disease resistance
04-003		Flavor Runner 458	African Plant introduction	High oleic early maturing
04-004		Flavor Runner 458	Bulgarian PI	High oleic early
04-005		Flavor Runner 458	Spanish PI	High oleic spanish
04-006		Flavor Runner 458	Chinese PI	High oleic early
04-007		Large Virginia	Flavor Runner 458	High oleic Virginia
04-008		Flavor Runner 458	African PI #2	High oleic early
05-008	2005	Large Virginia	N02-064ol	High oleic Virginia
05-009		Hiol Chico	M04-0211	High oleic Spanish
05-010		M03-0140	WT03-0051	Disease resistance and High oleic
05-011		Black Val	WT03-0048	High oleic Valencia and early maturing
05-012		PI 614086	WT03-0048	Early maturity and High oleic
05-013		SunOleic97R	M03-0194	High oleic and disease resistance
05-014		SunOleic97R	WT03-0048	High oleic for Texas
05-015		African PI #3	WT03-0051	High oleic and earliness

Puerto Rico Winter Nursery 2005-6

During the 2005-6 winter, 200 plots of early generation material and seed increase has been planted in Puerto Rico for rapid advancement of line. 165 of the plots are F1 and F2 seed to be harvested in March 2006 and planted in both Texas and Georgia in April and May of 2006.

Program Summary 2005

The evaluation of existing Flavor Runner lines is proceeding well. Potential lines for release have been identified for Texas and for the Southeast. New lines from recent crosses will be in the field this year for single plant selection. There has been excellent response and support for our work from all segments of the industry. We are continuing to look for more support as the project is still under funded but every year funding has increase.

Expense Item		*Amount*
Salary (Kim Moore and Jim Gregory)		$25,000.00
Travel (Kim Moore)		$4,800.00
Supplies (bags, tags, etc.)		$500.00
Chemicals and fuel		$1,200.00
	Total	$31,500.00

Texas Peanut Producers Board
Annual Research Report for 2005

Development of Peanut Cultivars with High O/L Ratios and Root-knot Nematode Resistance

J. L. Starr and C. E. Simpson
Dept. Plant Pathology & Microbiology, TAES, College Station, TX 77843; and TAMU Research and Extension Center, Stephenville, TX76401.

Summary

In 2005 we advanced more than 30 BC_3 generation breeding lines that have resistance to root-knot nematodes and carry the high O/L trait. Field tests for yield potential of theses lines will be initiated in 2006. Additionally, we made selections for the high O/L trait and nematode resistance from segregating BC_4F_2 generation populations. Numbers of seed of lines carrying both traits will be increased in 2006 for use in subsequent yield tests. We continue to make predicted progress in efforts to develop peanut with multiple disease resistance, high O/L ratio, and high yield potential.

Introduction

Recent actions by various peanut shellers and buyers have made it clear that the demand for Texas grown peanut with the high O/L trait is increasing. Additionally many industry representatives suggest that peanut cultivars without this trait may become unacceptable by the peanut industry in the future. Thus it is increasingly important that current efforts to introgress multiple disease resistance into modern peanut cultivars focus on breeding lines that have the high O/L trait. We have made projected progress in our efforts to develop peanut breeding lines that combine a high level of nematode resistance with the high O/L trait. Additionally, many of the breeding lines being developed also have resistance to the Tomato Spotted Wilt Virus and Sclerotinia Blight. Our primary objectives for 2005 were to increase supplies of seed of BC_3 generation lines that combine nematode resistance and the high O/L trait such the yield tests can begin in 2006. Additionally, we screened individuals from the still segregating BC_4F_2 generation for nematode resistance using molecular markers and for the high O/L trait using gas chromatography.

Our laboratory also provides assistance to the breeding efforts of Michael Baring by conducting the fatty acid analysis to determine the O/L ratio on samples from his breeding lines.

Materials and Methods

The ratio of oleic to linoleic fatty acid was measured on individual seed of the BC_4F_2 by cutting off a small portion of the seed distal to the embryo. The sample was macerated and fatty acids were extracted using organic solvents. The extracted fatty acids were then methylated to permit detection and quantification using gas chromatography. We were able to process approximately 100 samples per week using this system. Seeds for which the fatty acid content gave an O/L ration of greater than 10:1 were sent to Stephenville, where they were planted and used to produce a BC_4 F_3 generation.

To determine if a BC_4F_2individual carried the nematode resistance gene, a single unexpanded tetrafoliolate leaf was collected from the plant. DNA was extracted from the sample using a standardized extraction procedure, then the DNA was digested with the restriction enzyme Eco R1. The digested DNA was size fractionated by agarose electrophoresis and blotted onto a membrane. The blots were probed with the RFLP probe R2430E. If only the DNA fragment linked to the resistance gene was detected, the individual was scored as homozygous for resistance. If only the band associated with susceptibility was present, then the individual was scored as homozygous for susceptibility. If both the resistance and susceptibility associated bands were present, then the individual was scored as heterozygous for resistance.

By using these two techniques were are able to select individuals in a segregating population that are both resistant root-knot nematodes and carry the genes for the high O/L trait. Further field screening is required to select individuals with resistance to Tomato Spotted Wilt Virus, Sclerotinia Blight, and high yield potential.

Results

Nearly 1,200 samples were processed for determination of fatty acid content in 2005. One to four individuals per 10 individuals tested had a O/L ration of greater than 10.0 in segregating populations that were expected to have the high O/L trait. As expected, O/L ratios of 1.0 to 2.0 were most common in populations not expected to have the high O/L trait and the O/L ration in these populations never exceeded 3.0.

Nearly 500 samples were processed from ca 50 lines for nematode resistance using RFLP molecular markers. In general, 1 in 3 individuals were found to be homozygous for nematode resistance as would be expected for a resistance conditioned by a single dominant gene.

Using these two assays, approximately 60 individuals were selected that carry both nematode resistance and the high O/L trait. Most of these individuals been selected from a parental line that also carries resistance to Tomato Spotted Wilt Virus and (or) Sclerotinia blight.

In addition to the development of these BC_4F_2 generation breeding lines, in 2005 we planted for seed increase nearly 30 BC_3 generation breeding lines that carry the combination of nematode resistance and the high O/L trait. Sufficient seed was produced to permit initial of replicated field tests for yield potential and other traits of interest in 2006.

Discussion

During 2005 we achieved our primary objectives of advancing both a BC_3 and a BC_4 generation of peanut breeding lines that carry resistance to root-knot nematodes and the high O/L trait. Many of these breeding lines also carry resistance to Tomato Spotted Wilt Virus and Sclerotinia blight. The reason for developing both BC_3 and a BC_4 generation is because we are unsure if we will be able to select for sufficient yield potential in the BC_3 generation, thus are producing the BC_4 generation. We have high confidence of being able to select one or more lines with high yield potential, high O/L ratio and multiple disease resistance from these populations.

In 2006 we will begin yield testing several of the BC_3 generation lines. Additionally we will continue to increase numbers of seeds available for the BC_4 generation lines such that field tests for yield potential can begin in 2007.

Acknowledgements

We great fully acknowledge the continuing support of our research effort from the Texas Peanut Producers Board. Further, we acknowledge the superior technical support received from E. Morgan, F. Wang, and J. Michalka in J. L. Starr's lab; and J. Cason and B. Bennett in C. E. Simpson's lab.

Plant Pathology
March 10, 2006

TITLE: Peanut Disease Screening Nurseries and Other 2005 Work

PERSONNEL: Mark C. Black, Texas Cooperative Extension,
Texas A&M University Agric. Res. Ext. Center, Uvalde

SUMMARY:

Screening Nurseries. Peanut breeders use disease data in addition to yield, grade, pod characteristics, earliness, and kernel quality when deciding which breeding lines to save and which to discard. Data for spotted wilt were collected for nine tests at two locations in 2005 in Frio County under moderate to high spotted wilt intensities. Southern blight and leafspot diseases were at low intensities and rust was near zero in 2005 at these two locations.

Variety Acreage Survey. Estimated 2005 peanut variety usage was based on USDA FSA County Acreage Reporting, a survey of all peanut seed companies in Texas, Oklahoma, and New Mexico that provide seed for planting in Texas, and input on valencias from a private plant breeder. Percent acres among market types were 60.7% runner, 18.3% spanish, 13.8% virginia, and 7.2% valencia. FlavorRunner458 was again the most commonly planted variety in Texas (27.7% overall, 45.6% of runners; both percentages declined after the 2003 peak). TamrunOL01 was the second most commonly planted variety (14.2% overall, 23.4% of runners). Tamspan90 was the third most commonly planted variety in Texas and the most common spanish (10.8% overall, 59.0% of spanish). AT9899-14 was marketed as Spanish because of seed size, even though plant type, pod shape, and days to maturity resemble runner varieties. NC 7 was still the dominant virginia variety in 2005 (5.5% overall, 39.5% of virginia). High OL oil varieties were planted on 54.2% of acres in Texas in 2005, and these acres were mostly runners (91.3% runner, 8.6% spanish, 0.1% virginia). Varieties released by TAMU breeders were planted on 37.6% of all peanut acres (19.3% ‘97, 20.7% ‘98, 29.3% ‘99, 19.7% ‘00, 22.0% ‘01, 24.3% ‘02, 29.0% ‘03, 32.7% ’04, 37.6% ’05), accounting for 43.9% of all runner acres, 59.5% of all spanish acres, and 0 ac of virginia or valencia.

INTRODUCTION:

Peanut diseases and environmental stresses are major profit constraints for Texas peanut growers. We need to improve or at least maintain partial/field resistance levels now available in peanut to spotted wilt (caused by *Tomato spotted wilt virus* [TSWV]), Sclerotinia blight (caused by *Sclerotinia minor*), southern blight (caused by *Sclerotium rolfsii*), rust (caused by *Puccinia arachidis*), and other peanut diseases. Long term success of the variety improvement program depends on frequent disease evaluations for breeding lines. No single location in Texas provides screening opportunities for all these diseases, but spotted wilt is most consistent in Frio County.

Availability of peanut varieties and usage of each variety depends on market preference for the high O/L trait and variety performance under Texas conditions. Seed companies, breeders, buyers, consultants, and others use the annual survey for planning purposes.

Objectives were to: 1) assist Michael Baring, Mark Burow, and Charles Simpson with variety development by screening high O/L peanut breeding lines for resistance to spotted wilt and other endemic diseases in southwest Texas (Frio County) disease nurseries and providing labor for plot maintenance and harvesting; 2) survey peanut seed handlers for the annual Texas variety acreage estimates.

MATERIALS/METHODS:

Screening Nurseries. Selected varieties and breeding lines were planted 25 and 26May04 in replicated or non-replicated two-row small plot tests within irrigated production fields at Bennett Partnership Farm and Phillips Farm and in Frio County by M. Baring, B. Easterling, and J. Lopez. Two of every six rows at Phillips were planted with TSWV-susceptible Tamrun88 as a susceptible check and to increase spotted wilt disease incidence in the plot area through secondary spread. Selected tests were shortened to 11 ft on 22June. The experimental designs were randomized complete blocks with three or four replications, except for one small non-replicated test.

Spotted wilt was recorded on multiple dates at both locations as number of row feet with symptoms. Data were converted to percent row feet with major symptoms before statistical analysis using PROC ANOVA using PC-SAS software.

Some hand weeding was done at both locations and assistance was provided with digging (6Oct) and threshing (week of 11Oct) small plots. Assistance was also provided with threshing at Baring's plots at Slomchenski location (13Oct) in Atascosa Co.

Variety Acreage Survey. Peanut seed handlers in Texas, Oklahoma, and New Mexico were contacted for seed sales data to estimate 2005 Texas variety planted acres. A private breeder assisted with valencia estimates. Seeding rate estimates by market type or specific variety were used to estimate acres planted to each variety using 2005 preliminary USDA market type acreage reports.

RESULTS AND DISCUSSION:

Spotted wilt incidence was mostly high at Phillips and moderate at Bennett, and test averages were similar to those of 2004. Significant heat and moisture stress occurred in September 2005 due to a 7+ day heat wave when temperatures exceeded 100 F for several days and 113 F one day. See the report by Baring and Burow for yield, grade, and value estimates in these Frio County tests.

Screening Nurseries. See Table 1for disease rating summaries. Entry 1 in both Advanced Lines Tests was among the lines increased in 2005 and is under review for a new variety releases (see report by Baring, Simpson, Burow).

Variety Acreage Survey. Peanut variety usage (% overall acres) continued to change in Texas (Table 1). FlavorRunner458 use decreased in 2005 for the second consecutive year (0.2% '97, 3.1% '98, 15.1% '99, 25.3% '00, 29.0% '01, 32.5% '02, 35.7% '03, 31.8% '04, 27.7% '05) but was still by far the most commonly planted peanut variety in Texas in 2005 for the sixth year. Tamrun96 usage in 2005 decreased (0.4% '97, 4.7% '98, 12.4% '99, 9.2% '00, 13.9% '01, 11.9% '02, 7.5% '03, 9.2% '04, 6.6% '05). The two most recent runner variety releases from TAMU had increased usage as seed supplies met demand or increased, respectively, and both have the high OL trait: TamrunOL01 (0.3% '02, 5.8% '03, 12.1% '04, 14.2% '05) and TamrunOL02 (0.2% '03, 1.8% '04, 5.9% '05).

Tamspan90 was the dominant spanish variety again in 2005 (10.8% overall). Relative use of spanish market type varieties in Texas increased in 2005 (17.0% '97, 12.2% '98, 10.2% '99, 9.3% '00, 10.1% '01, 13.6% '02, 19.1% '03, 14.0% '04, 18.3% '05). Spanish acres (approx.) planted was slightly greater than the 9-year average (54,146 ac '97, 44,870 ac '98, 36,593 ac '99, 38,847 ac '00, 42,582 ac '01, 47,197 ac '02, 55,068 ac '03, 33,050 ac '04, 47,466 ac '05). Due to unfortunate circumstances, OLin seed supplies were much less than the demand in 2005. High OL AT9899-14 was marketed as spanish because of seed size, even though plant type, pod shape, and days to maturity resemble runner varieties. In contrast, TAMU is considering releasing a high OL variety with seed size and shape similar to most runners, but with plant type and days to maturity resembling most spanish varieties.

Virginia market type use decreased in 2005 (overall: 10.1% '97, 13.9% '98, 10.4% '99, 10.5% '00, 8.7% '01, 12.0% '02, 16.0% '03, 18.7% '04, 13.8% '05). NC 7 use in 2005 was similar to 2004 (within market type: 100% ‘97, 100% ‘98, 97.8% ‘99, 74.9% ‘00, 81.4% ‘01, 65.3% ‘02, 58.8% ’03, 37.2% ’04, 39.5% ’05). Jupiter use increased in 2005 (within market type: 0.2% ‘01, 12.2% ‘02, 5.2% ’03, 13.1% ’04, 20.9% ‘05). ATVC2 use decreased in Texas in 2005 after increasing for 6 years (within market type: 0% ’98, 0.1% ‘99, 1.1% ‘00, 1.4% ‘01, 14.9% ‘02, 22.8% ’03, 24.8% ’04, 14.8% ‘05).

Valencia use remained the lowest of the four market types (overall: 2.8% ‘97, 3.0% ‘98, 0.8% ‘99, 0.9% ‘00, 1.8% ‘01, 2.1% ‘02, 4.1% ’03, 4.4% ’04, 7.2% ‘05), but 2005 was a 9-year high for this market type with approx. 18,528 ac planted. Unusually high contract offerings (approx. $600/ton) in early 2005 for valencia production caused the acreage increase. Valencia C was the most common valencia variety in 2005 (3.8% ’05 overall).

Preference in parts of the peanut industry for varieties with improved oil quality (high O:L ratio) continues to be a major factor in peanut variety choice in Texas (overall: 4.9% ‘97, 5.5% ‘98, 17.9% ‘99, 28.0% ‘00, 31.8% ‘01, 41.4% ‘02, 45.0% ’03, 50.3% ’04, 54.2% ‘05).

Seeding rates in 2005 were higher than average. This was apparently a reaction to some seed quality problems and resultant low plant populations in 2004, particularly with FlavorRunner458 and Tamrun OL02 (see table footnote for the adjustments used). No confirmation was available, but it is also possible that some growers replanted or supplement-planted after cold weather affected initial 2005 seedling emergence in West Texas.

ACKNOWLEDGMENTS: The Texas Peanut Producers’ Board provided partial financial support. Appreciation is expressed to all cooperators: Murray Phillips, Tech Farm, Pearsall; and James Overstreet and Larry New, Bennett Partnership, Pearsall. Thanks to County Extension Agent-IPM Brad Easterling and CEA-Agriculture Jaime Lopez and for their help and encouragement. Tests with breeding lines were in cooperation with the peanut breeding team, Michael Baring, Mark Burow, and Charles Simpson and their staff at College Station, Lubbock, and Stephenville as well as the staff at Beeville Station. Thanks to Alfred Sanchez, James ‘Bud’ Davis, and Marvin Saenz for technical support and data entry. Maggie Gunn provided secretarial support.

Table 1. Spotted wilt ratings in 2005 screening nurseries in Southwest Texas, Frio County, TX.

------A. Advanced Lines Test 1 at Phillips------

Entry	EnNo	Spotted wilt, % row ft 8Sep	4Oct
FlavoRunner458	19	56.3	85.4
	8	57.3	78.1
Florunner	20	42.7	76.0
TamrunOL01	16	22.9	62.5
Tamrun96	18	17.7	52.1
	4	15.6	51.0
TamrunOL02	17	15.6	51.0
	10	16.7	47.9
	9	21.9	46.9
	14	16.7	44.8
	3	22.9	42.7
	2	12.5	39.6
	13	11.5	38.5
	15	13.5	38.5
	12	12.5	38.5
	5	8.3	32.3
	11	5.2	31.3
	1	7.3	28.1
	6	3.1	25.0
	7	3.1	24.0
Average		**19.2**	**46.7**
LSD 0.05*		**16.0**	**18.2**
CV, %**		**59**	**28**

----B. Advanced Lines Test 1 at Bennett-----

Entry	EnNo	Spotted wilt, % row ft 8Sep	4Oct
Florunner	20	7.3	32.3
FlavoRunner458	19	4.2	29.2
	8	2.1	24.0
TamrunOL01	16	2.1	22.9
Tamrun96	18	8.6	19.1
TamrunOL02	17	2.1	14.6
	14	1.0	13.2
	11	3.1	10.4
	10	0.0	9.4
	4	2.1	9.4
	5	0.0	8.9
	6	1.0	8.3
	9	1.2	7.7
	12	1.0	7.3
	7	3.1	6.4
	15	3.1	6.3
	1	1.0	5.2
	3	1.0	5.2
	13	1.0	4.2
	2	0.0	2.1
Average		**2.3**	**12.3**
LSD 0.05*		**N.S.**	**15.3**
CV, %**		**186**	**88**

*Least significant difference. Averages for two entries are significantly different at *P*=0.05 if their difference is at least the LSD.05 value.

**Low C.V. (Coefficient of Variation) indicates more consistent data.

---C. Spanish Lines Test at Phillips-----

Entry	EnNo	Spotted wilt, % row ft 8Sep	4Oct
OLin	6	29	57
	2	30	54
	5	28	50
	4	27	45
	1	22	44
	3	22	40
Average		**26**	**48**
LSD 0.05		**N.S.**	**N.S.**
CV, %		**32**	**17**

-----D. Line 5415 Increase at Phillips--------

Entry	Spotted wilt, % row ft 8Sep	4Oct
Tx035415-85	26	51
Tx035415-88	19	50
Tx035415-87	17	50
Tx035415-89	19	46
Tx035415-14Tan	10	44
Tx035415-86	15	44
Tx035415-78	15	42
Tx035415-15	6	42
Tx035415-45	19	40
Tx035415-46	17	40
Tx035415-84	19	39
Tx035415-77	17	39
Tx035415-92	14	39
Tx035415-83	22	38
Tx035415-79	13	35
Tx035415-91	13	32
Tx035415-75	11	32
Tx035415-82	4	28
Tx035415-94	11	28
Tx035415-93	6	26
Average	**15**	**39**
LSD 0.05	**N.S.**	**N.S.**
CV, %	**73**	**35**

*Least significant difference. Averages for two entries are significantly different at *P*=0.05 if their difference is at least the LSD.05 value.

**Low C.V. (Coefficient of Variation) indicates more consistent data.

-----E. Burow Early Maturing Runner F2:7 at Phillips-----------------------------

Entry	EnNo	Spotted wilt, % row ft 8Sep
	19	82
	11	76
BSS56	1	72
	12	71
Spanco	5	69
	27	67
	15	60
	28	57
	9	56
	26	53
	20	50
	23	50
	18	49
	22	47
	10	46
	17	43
	25	43
	13	43
NC7	3	41
	21	39
	16	35
	14	33
	7	33
Florunner	2	31
	30	28
	8	24
	24	19
	29	12
	6	11
TamrunOL02	4	4
Average		**45**
LSD 0.05*		**21**
CV, %**		**28**

*Least significant difference. Averages for two entries are significantly different at *P*=0.05 if their difference is at least the LSD.05 value.

**Low C.V. (Coefficient of Variation) indicates more consistent data.

---F. C.E. Simpson Root Knot Nematode Resistant Lines at Phillips-----------------

		Disease, % row ft[z]		
EnNo	**Entry**	**SW 8Sep**	**SB 8Sep**	**SW 6Oct**
1		17	0	58
Check	Tamrun88	100	0	100
2		42	0	83
3		8	50	67
4	Tamrun96	42	0	58
5		0	8	67
6		0	8	33
Check	Tamrun88	83	0	100
7		25	0	58
8		17	0	58
9		17	0	50
10	GeoGreen	42	0	75
11		33	0	42
12		8	8	50
13		42	0	58
14	Tamrun88	83	0	100
15		58	0	100
16	TP465-4-3	17	0	50
Check	Tamrun88	92	0	100
17	TP465-4-4	0	0	58
18	TP465-4-6	8	0	50

[z]SW = Spotted wilt; SB = Southern blight

-------G. Uniform Peanut Performance Test at Bennett-------------------------------

Entry	Spotted wilt, % row ft 8Sep	4Oct
Flavorunner458	13.5	28.1
NC7	6.3	21.9
Florunner	2.1	18.8
TamrunOL01	0.0	13.5
VT003069	0.0	11.6
Tx033607	2.1	11.5
TamrunOL02	0.0	10.4
UF03325	0.0	6.5
Tx034145	1.0	6.5
N01013T	0.0	5.3
N03090T	2.2	4.4
N02006	0.0	4.2
GA011514	1.0	4.2
UF03326	0.0	3.2
Tx033630	1.0	3.1
UF04327	1.0	3.1
CRSP08	0.0	2.8
CRSP14	2.5	2.5
GA012534	0.0	2.1
GA011568	0.0	2.1
Average	**1.6**	8.3
LSD 0.05	**5.6**	11.0
CV, %	**242**	93.0

-------H. Baring Germplasm Line Increase at Bennett---

Entry	EnNo	Spotted wilt, % row ft 8Sep	4Oct
Tx964117-1	9	19.4	62.5
Tx901338-2	4	10.2	20.2
Tx964120-14	11	10.2	19.3
Tx964120-19	5	0.0	14.4
Tx964120-3	10	1.4	10.3
White US224	1	1.8	10.0
Tx964120-22	6	0.0	8.3
Tx964120-24	7	1.4	8.3
Red US224	2	0.0	6.7
Tx964120-25	8	1.4	5.8
Tx901639-3	3	1.4	5.6
Average		**4.3**	15.6
LSD 0.05		**5.5**	12.3
CV, %		**75**	47

*Least significant difference. Averages for two entries are significantly different at *P*=0.05 if their difference is at least the LSD.05 value.

**Low C.V. (Coefficient of Variation) indicates more consistent data.

Table 2. 2005 Texas Peanut Variety Survey.[x]

----------A. Variety[y] within market type----------					
		Pounds	**Percent lbs.**	**Acres**	**Percent acres**[z]
Runner variety	*FlavorRun458*	9743100	48.79	71640	45.58
	TamrunOL01	4593950	23.01	36752	23.38
	TamrunOL02	1901750	9.52	15214	9.68
	Tamrun96	1846050	9.25	17093	10.87
	GeorgiaGreen	454200	2.27	4206	2.68
	GP-1	399450	2.00	3699	2.35
	ViruGard	460650	2.31	3685	2.34
	AT-108	301700	1.51	2414	1.54
	Okrun	165000	0.83	1528	0.97
	AT1-1	81900	0.41	758	0.48
	GA-04S	20000	0.10	200	0.13
	Andru II	300	0.00	3	0.00
All runner		19968050	100.00	157191	100.00
Spanish variety	Tamspan90	2744540	59.00	28006	59.00
	AT9899-14	1159200	24.92	11829	24.92
	Spanco	725850	15.60	7407	15.60
	OLin	22100	0.48	226	0.48
All spanish		4651690	100.00	47466	100.00
Virginia variety	NC7	1795900	39.48	14141	39.48
	Jupiter	951700	20.92	7494	20.92
	ATVC2	675300	14.84	5317	14.84
	Gregory	571350	12.56	4499	12.56
	NC12C	444550	9.77	3500	9.77
	Perry	84550	1.86	666	1.86
	Brantley	15900	0.35	125	0.35
	Wilson	10000	0.22	79	0.22
All Virginia		4549250	100.00	35821	100.00
Valencia variety	ValenciaC	834550	52.99	9818	52.99
	ValenciaA	586350	37.23	6898	37.23
	Valencia101	77000	4.89	906	4.89
	Valencia102	77000	4.89	906	4.89
All valencia		1574900	100.00	18528	100.00

----------B. Overall by variety----------					
Market type, Variety		**Pounds**	**Percent lbs.**	**Acres**	**Percent acres**
Runner	*FlavorRunner458*	9743100	31.69	71640	27.66
	TamrunOL01	4593950	14.94	36752	14.19
	TamrunOL02	1901750	6.19	15214	5.87
	Tamrun96	1846050	6.00	17093	6.60
	GeorgiaGreen	454200	1.48	4206	1.62
	GP-1	399450	1.30	3699	1.43
	ViruGard	460650	1.50	3685	1.42
	AT-108	301700	0.98	2414	0.93
	Okrun	165000	0.54	1528	0.59

	AT1-1	81900	0.27	758	0.29
	GA-04S	20000	0.07	200	0.08
	Andru II	300	0.00	3	0.00
Spanish	Tamspan90	2744540	8.93	28006	10.81
	AT9899-14	1159200	3.77	11829	4.57
	Spanco	725850	2.36	7407	2.86
	OLin	22100	0.07	226	0.09
Virginia	NC7	1795900	5.84	14141	5.46
	Jupiter	951700	3.10	7494	2.89
	ATVC2	675300	2.20	5317	2.05
	Gregory	571350	1.86	4499	1.74
	NC12C	444550	1.45	3500	1.35
	Perry	84550	0.28	666	0.26
	Brantley	15900	0.05	125	0.05
	Wilson	10000	0.03	79	0.03
Valencia	ValenciaC	834550	2.71	9818	3.79
	ValenciaA	586350	1.91	6898	2.66
	Valencia101	77000	0.25	906	0.35
	Valencia102	77000	0.25	906	0.35
All Varieties		30743890	100.00	259006	100.00

----------C. Overall by market type--

Market type	Pounds	Percent lbs.	Acres	Percent acres
Runner	19968050	64.95	157191	60.69
Spanish	4651690	15.13	47466	18.33
Virginia	4549250	14.80	35821	13.83
Valencia	1574900	5.12	18528	7.15
All market types	30743890	100.00	259006	100.00

[x]Cooperators in this survey were: USDA FSA, College Station, TX, Birdsong Peanut Co., Brownfield, TX; Golden Peanut Co., DeLeon, TX; Wilco Peanut Co., Pleasanton, TX; Clint Williams Peanut Co., Madill, OK; Lee County Peanut Co., Giddings, TX; Sunland Industries, Portales, NM; Portales Select/Bordens, Portales, NM, Glen's Peanuts, Portales, NM, Texas Foundation Seed, Vernon, TX, and Norman Wilson, plant breeder, Lubbock, TX.

[y]Variety name in *italics* indicates high OL seed oil.

[z]Assumptions: Average seeding rates used in 2005 were estimated by variety or entire market type for both irrigated and dryland acres as follows. Runner: 136 lb/ac (FlavorRunner458), 108 lb/ac (Tamrun96, GeorgiaGreen, AT1-1, Okrun, GP-1, Andru II), 125 lb/ac (TamrunOL01, TamrunOL02, ViruGard, AT-108), 100 lb/ac (GA-04S); spanish: 98 lb/ac; virginia: 127 lb/ac; valencia: 85 lb/ac.

<u>Subject Area:</u> Disease management
<u>Project Title:</u> Techniques for screening Spanish and Runner peanuts against Cylindrocladium black rot.
<u>Personnel and Agency:</u> Terry Wheeler; Plant Pathologist, Texas Agricultural Experiment Station, Rt. 3 Box 219, Lubbock, TX 79403; Telephone 806-746-4014; Fax 806-746-6528; email: ta-wheeler@tamu.edu
Charles E. Simpson, Peanut Breeder, TAES, Stephenville; Scott Russell, TCE, Extension Agent-Integrated Pest Management, Brownfield.

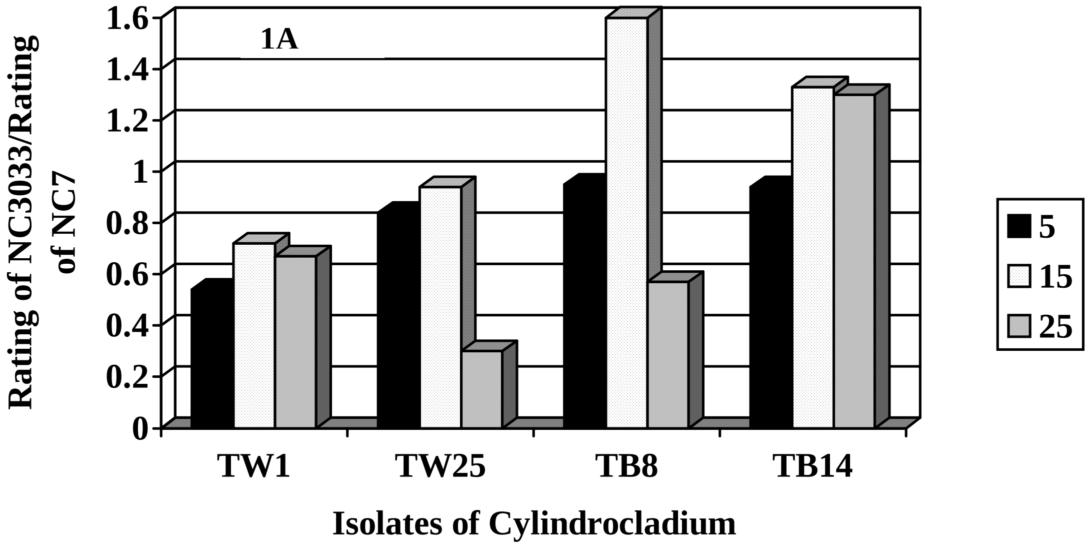
Objective 1) Survey Terry co. fields in August and September around the area of the first infested field for CBR (survey to be done by Scott Russell and isolations by Terry Wheeler).

Objective 2) Test various greenhouse procedures to distinguish between susceptible and at least moderately resistant cultivars (T. Wheeler).

Objective 3) Using the best greenhouse protocol, test Spanish and Runner types developed and/or grown in west Texas against CBR.

The fields immediately adjacent and near the *Cylindrocladium* infested field were monitored in 2005 for appearance of disease symptoms. No plants were found with the disease.

The variables that are being tested in the greenhouse to develop a screening procedure include: isolate of *Cylindrocladium*, density of *Cylindrocladium*, affect of temperature on symptom expression, and affect of pot size on symptom expression. A susceptible (NC7), intermediate (TamRun 98 or Perry), and resistant (NC 3033) genotype was used in each test. The goal was to determine the conditions that lead to the largest difference between ratings of a susceptible and resistant genotype. We are not looking for the most disease, but the biggest differences between what is known to be highly susceptible (NC7) and good resistance (NC3033). This work is being conducted by a Master's student at Texas Tech and is still ongoing. We have determined that Isolate TW1 gave the most consistent results at 73 F in a growth chamber (Fig. 1A) and in a cooled temperature environment (Fig. 1B). Current experiments are being conducted in the greenhouse at moderate temperatures (71 – 85 F) to determine the best pot size. All three densities and both moderate and cool temperatures were acceptable with isolate TW1 for distinguishing between the susceptible and resistant check. The intermediate line TamRun 98 proved to be susceptible, but the seed was old and it is likely that poor vigor affected the results (results not shown). The intermediate Perry did give intermediate levels of disease (results not shown). Currently a test is being conducted on the affect of pot size. When this test has been repeated, then the third objective (screening Spanish and Runner types from Charles Simpson) will be conducted.



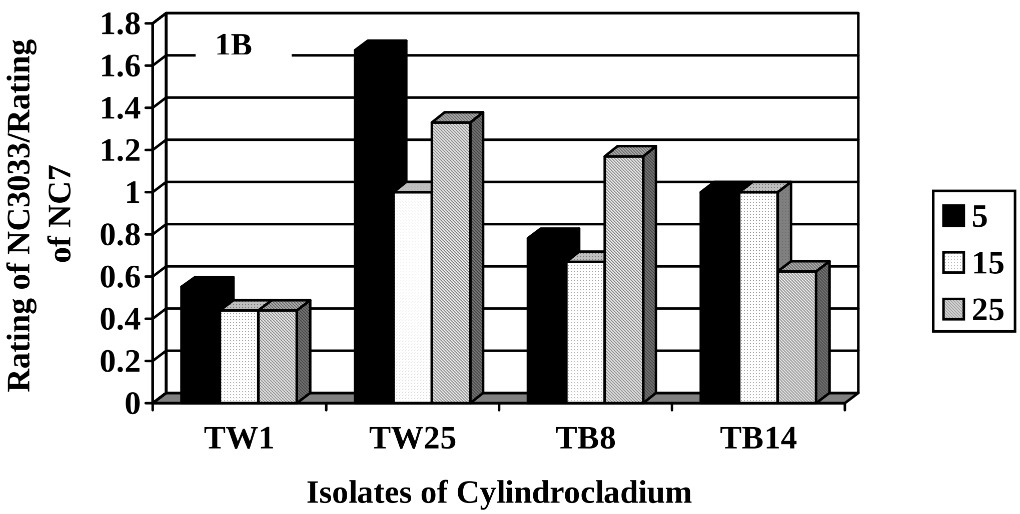


Figure 1. The ratio of the *Cylindrocladium* resistant genotype (NC3033) to the *Cylindrocladium* susceptible (NC7) genotype when grown in soil infested with the *Cylindrocladium* black rot fungus at densities of 5, 15, and 25 microsclerotia/cc soil. The lower the ratio, the better the difference between the resistant and susceptible variety. This test was conducted at 73 F (Fig. 1A) in a growth chamber or in a cool temperature tank (Fig. 1B) where temperatures fluctuated between 55 and 73 F. The most consistent differences between the resistant and susceptible genotypes was found with TW1, where there was approximately twice as much disease on the susceptible as the resistant genotype at all three inoculum densities tested.

Use of Fungicides, Varieties and Spray Program in South Texas Peanut Production

A. J. Jaks , W. J. Grichar and M. R. Baring

Project Summary

Seven peanut varieties were selected for use in the test in which plots of these varieties were unsprayed, sprayed four times routinely, and sprayed by the AU-Pnut fungicide advisory. These varieties were FlavorRunner 458, Tamrun-96, Tamrun OLO1, Tamrun OLO2, Nematam and two advanced breeding lines from the Texas Agricultural Experiment Station breeding program. Due to moderate leaf spot infection, only two sprays were advised by the AU-Pnut advisory. Only four of five planned fungicide sprays were applied routinely due to the moderate infection levels. There was no difference in yield or dollar value per acre between varieties which received no fungicide sprays and varieties which received four routine or two advised sprays. All varieties which received four fungicide sprays had significantly less foliar disease than advisory plots which received two sprays. Nematodes in the test field limited yield and vigor for all varieties including Nematam and FlavorRunner 458 which inadvertently came from and aged seed source of poor quality.

INTRODUCTION

Grower use of peanut varieties, fungicides and spray programs must result in effectiveness, efficiency and profit in today's peanut market. Selections for peanut variety, fungicide and application times are decisions growers must make and be on target with. Peanut varieties, both registered and experimental, fungicides, and spray programs need to continuously be evaluated by research personnel in order to provide a data base for growers, consultants and farm managers.

MATERIALS AND METHODS

The seven peanut varieties selected for the 2005 peanut year test were FlavorRunner 458, Tamrun-96, Tamrun OLO1, Tamrun OLO2, NemaTam and two advanced breeding lines from the Texas A&M University peanut breeding program. The seven varieties were planted in a split plot design with four replications for statistical analysis. Plots for each variety were two rows spaced 38-inches apart, each 20 feet long. Varieties were planted (101 lb/A) using a Monosem precision vacuum planter. Blocks of each of the seven varieties in each replicate were unsprayed, sprayed four times routinely, and sprayed according to the AU-Pnut advisory. The routine four spray blocks were fungicide sprayed every 21-days starting at 33 days after planting. Bravo 720 (1.5 pt. /A) was applied at the 33 day spray with Folicur 3.6F (7.2 fl. oz. /A) applied at the 54, 76 and 97 day sprays. Blocks of varieties sprayed by the AU-Pnut advisory resulted in two sprays applied at 49 and 76 days after planting. Bravo 720 (1.5 pt. /A) was used at the 49 day spray with Folicur 3.6F (7.2 fl. oz. /A) used at the 76 day spray. The AU-Pnut advisory uses "rain events" (0.1 inch or greater) from rainfall or irrigation to count up these respective events which lead to advised fungicide sprays. Fungicides were applied with a CO_2 pressurized (56psi) belt-pack sprayer equipped with a two row hand-held boom with three nozzles (D2 tips, #23 cores and slotted strainers) per row. Spray rate was 15 gallons per acre at 3.0 mph walking speed. The grower followed standard practices for land preparation, fertility and weed control. Circle pivot irrigation provided supplemental water during the growing season. Assessment of leaf spot was made by visual rating using the Florida leaf spot scale where 1= no disease, and 10= plants dead, completely defoliated from leaf spot. Peanut rust or soilborne disease from southern blight (*S. rolfsii)* or Rhizoctonia (*R. solani)* did not occur in this year's test for evaluation. Test plots were dug, inverted and air dried in the field and combined with a two row combine. Plot samples were then force air dried to 10% moisture, cleaned of debris and weighed to determine yield per acre. Samples were then removed from plot harvest for the grading procedure to determine grade and economic value. Disease ratings, yield, grade and dollar value per acre were analyzed statistically.

RESULTS AND DISCUSSION

Inadvertently, seed of NemaTam and FlavorRunner 458 was used which was old and of poor quality resulting in poor stand and vigor. Nematodes in the test field did not benefit these varieties as well as the other varieties. Nematode infestation no doubt affected grade of the varieties tested. Leaf spot pressure during this particular test year was minimal from dry weather conditions. This was evidenced by yield which was similar between unsprayed and fungicide sprayed plots. All factors considered, the AU-Pnut advisory program did work in that it only advised two fungicide sprays during the dry growing season. However, dollar values per acre while not statistically different were greater for varieties which received four routine fungicide sprays. Even with moderate disease pressure fungicide use is important to provide protection, as in the case of systemic fungicides, maintain plant health, and benefit the crop in yield, grade and dollar values. Rating yield, grade and economic value data is presented in Table 1.

ACKNOWLEDGEMENTS

The researchers extend special thanks to the Texas Peanut Producers Board for interest in and financial support of this research study and program. Special appreciation is extended to Mr. Jimmy Seay, TPPB member and producer from Atascosa County who has interest in and allowed us to conduct this research. Appreciation is extended to Bill Klesel, Kevin Brewer and Dwayne Drozd for technical assistance with this research.

Table 1. Variety Fungicide Data from Atascosa County, 2005.

Variety/Schedule	Leaf spot[2] 10-05-05	Leaf spot[2] 11-08-05	Yield lb/A	Grade	$/Acre
FlavorRunner 458 (Unsprayed)	2.6 a-c[1]	5.9 ab	1606 c	66 ab	254.62 b
FlavorRunner 458 (4 Spray)	1.0 f	2.6 e	2568 a-c	68 ab	422.17 ab
FlavorRunner 458 (AU-Pnut)	2.0 c-e	3.5 cd	2416 bc	68 ab	383.57 ab
Tamrun-96 (Unsprayed)	3.0 a	6.0 a	3016 ab	68 ab	474.60 a
Tamrun-96 (4 Spray)	1.4 ef	3.0 de	3025 ab	68 ab	489.72 a
Tamrun-96 (AU-Pnut)	2.0 c-e	3.6 c	2841 ab	69 a	465.68 a
TX033630 (Unsprayed)	3.1 a	5.6 ab	2933 ab	66 ab	440.45 ab
TX033630 (4 Spray)	1.1 f	2.8 e	3379 ab	69 a	532.07 a
TX033630 (AU-Pnut)	2.1 b-d	3.5 cd	2567 a-c	66 ab	376.88 ab
Tamrun OLO1 (Unsprayed)	2.8 ab	5.8 ab	2772 ab	65 ab	400.29 ab
Tamrun OLO1 (4 Spray)	1.0 f	2.9 e	3388 ab	69 a	557.18 a
Tamrun OLO1 (AU-Pnut)	1.9 de	3.5 cd	3669 a	64 b	483.11 a
Tamrun OLO2 (Unsprayed)	3.1 a	5.9 ab	2580 a-c	67 ab	382.40 ab
Tamrun OLO2 (4 Spray)	1.1 f	2.9 e	2893 ab	68 ab	469.73 a
Tamrun OLO2 (AU-Pnut)	2.0 c-e	3.6 c	2491 a-c	66 ab	354.32 ab
Nematam (Unsprayed)	2.6 a-c	5.4 b	2378 bc	68 ab	396.40 ab
Nematam (4 Spray)	1.0 f	2.6 e	2970 ab	68 ab	480.88 a
Nematam (AU-Pnut)	2.0 c-e	3.5 cd	2881 ab	67 ab	471.35 a
TX033607 (Unsprayed)	2.9 a	5.9 ab	2776 ab	67 ab	410.96 ab
TX033607 (4 Spray)	1.0 f	2.8 e	3051 ab	67 ab	488.34 a
Tx033607 (AU-Pnut)	1.5 d-f	3.5 cd	3083 ab	68 ab	477.19 a

[1] Means in a column followed by the same letter indicate Duncan's New Multiple Range groupings of treatments which do not differ significantly (P=0.05).

[2] Leaf spot disease rating based on the Florida leaf spot assessment scale where 1=no disease, 10=plants dead, completely defoliated from leaf spot.

Devising and Demonstrating Control Schemes for Peanut Disease

Chip Lee, Extension Plant Pathologist Texas Cooperative Extension – Stephenville

Summary

A seedling disease study was conducted in Gaines County to evaluate the following products: Dynasty, Vitavax, and Abound. A field study was conducted in Gaines County to evaluate the effectiveness of various fungicides programs on rhizoctonia. Products evaluated included: Folicur, Mana TBZ, Equs 720, JAU 6476, Sparta, V-10116, Headline, Abound, Bravo Weatherstick, and Echo 720. Field studies were conducted in Collingsworth, Comanche, and Erath Counties to evaluate the effectiveness of various fungicide programs on leafspot. Products evaluated included: Folicur, Mana TBZ, Equs 720, JAU 6476, Sparta, V-10116, Bravo Weatherstick, Echo 720, SA-120301, and USF 2010. Results from these trials can be found in the tables below.

Seedling Disease Trial
Gaines County
21 day Stand Count

May 18, 2005

Treatment	Rep 1		Rep 2		Rep 3		Average
UTC	9	X	11	3	5	9	7.4
Dynasty 4 oz	11	21	16	4	21	17	15
Vitavax 4 oz	12	14	3	6	6	12	8.83
Vitavax 4 oz Abound 6 oz	14	10	8	9	12	6	9.83
Vitavax 4 oz Abound 3oz	13	12	22	17	12	7	13.83
Vitavax 4 oz Abound 6 oz	12	X	8	9	17	9	11

35 Day Stand Count

June 1, 2005

Treatment	Rep 1		Rep 2		Rep 3		Average
UTC	37	X	30	37	25	27	31.2
Dynasty 4 oz	58	55	52	30	46	43	47.3
Vitavax 4 oz	50	49	40	41	53	50	47.1
Vitavax 4 oz Abound 6 oz	53	36	50	41	30	34	40.6
Vitavax 4 oz Abound 3oz	43	36	47	36	40	31	38.8
Vitavax 4 oz Abound 6 oz	55	X	40	35	48	37	43

The X's were human error during planting and did not figure into the average.

Gaines County Peanut Seedling Disease
2005

Treatment	Rep	Yield	% SMK + SS	% Damaged	% Inmature	Value/Ton	Value/Acre
1	1	3660	78%	1%	1%		
	2	3144	74%	0%	2%		
	3	3763	74%	0%	2%		
	Avg	3522	75%	0%	2%	$ 365	$ 643
2	1	4381	77%	2%	1%		
	2	3505	76%	0%	2%		
	3	3969	77%	1%	2%		
	Avg	3952	77%	1%	2%	$ 375	$ 740
3	1	4433	75%	1%	2%		
	2	3247	72%	1%	3%		
	3	4897	77%	0%	2%		
	Avg	4192	75%	1%	2%	$ 365	$ 765
4	1	3814	74%	1%	3%		
	2	4175	75%	1%	3%		
	3	3093	72%	2%	3%		
	Avg	3694	74%	1%	3%	$ 362	$ 668
5	1	3866	71%	1%	2%		
	2	3969	77%	0%	2%		
	3	3093	75%	0%	2%		
	Avg	3643	74%	0%	2%	$ 360	$ 656
6	1	4381	77%	0%	1%		
	2	4021	74%	2%	1%		
	3	4845	75%	1%	3%		
	Avg	4416	75%	1%	2%	$ 365	$ 806

Runner type peanut
Values based on loan price
Planted April 26, 2005
Harvested October 5, 2005
Plot size: 2 rows X 100 X 3 ft.

Gaines Rhizoctonia Legend

Treatment	Product	Timing	Amt/Acre
1	Folicur 3.6	as needed	0.2 #ai
2	Mana TBZ 3.6	as needed	0.2
3	Mana TBZ 20EW	as needed	0.2
4	Equs 720 6F Folicur 3.6	2, 7 3, 4, 5, 6	.75#ai 0.2
5	Equs 720 Mana TBZ 3.6	2, 7 3, 4, 5, 6	0.75 0.2
6	Equs 720 Mana TBZ 20EW	2, 7 3, 4, 5, 6	0.75 0.2
7	Bravo Weather Stick Folicur 3.6 fl	2, 7 3, 4, 5, 6	0.75 0.2
8	UTC		
9	Echo 720 JAU 6476 Folicur 3.6	2, 3, 8 4, 5, 6, 7 4, 5, 6, 7	1.5 pt 2.38 oz 5.3 oz
10	Echo 720 JAU 6476 Folicur 3.6	2, 3, 8 4, 5, 6, 7 4, 5, 6, 7	1.5 pt 2.38 oz 5.3 oz
11	Echo 720 Folicur 3.6 USF 2010 Folicur 3.6	2, 7 3, 5 3, 5 4, 6	1.5 pt 5.2 oz 3.5 oz 7.2 oz
12	Echo 720 Folicur 3.6 USF 2010 Folicur Echo 720	2, 7 3, 5 3, 5 4, 6 4, 6	1.5 pt 5.2 oz 3.5 oz 7.2 oz 1 pt
13	Sparta Echo 720	2, 4, 6 as needed	7.2 oz 1.5 pt
14	V-10116 50 WD +NIS	2, 4, 6 2, 4, 6	.107 lb ai 0.125 vv
15	V-10116 50 WD +NIS	2, 4, 6 2, 4, 6	0.156 lb ai 0.125 vv
16	Headline Folicur Headline Folicur	2 3 4 5	12 oz 7.2 oz 12 oz 7.2 oz
17	Headline Endura	3 5	12 oz 9 oz
18	Headline Folicur Headline Folicur	2 3 4 5	15 oz 7.2 oz 15 oz 7.2 oz
19	Abound Folicur Abound Folicur	2 3 4 5	18.4 oz 7.2 oz 18.4 oz 7.2 oz

Gaines County Rhizoctonia
2005

Treatment	Rep	Yield	% SMK + SS	% Damaged	% Inmature	Value/Ton	Value/Acre
1	1	0					
	2	6207	79%	0%	1%		
	3	6077	78%	0%	1%		
	Avg	6142	79%	0%	1%	$ 382.00	$1,174.00
2	1	6338	80%	0%	1%		
	2	7057	78%	0%	1%		
	3	5423	81%	0%	1%		
	Avg	6273	80%	0%	1%	$ 388.00	$1,216.00
3	1	6665	80%	0%	0%		
	2	6207	79%	0%	1%		
	3	6142	80%	0%	0%		
	Avg	6338	80%	0%	0%	$ 386.00	$1,224.00
4	1	6469	80%	0%	1%		
	2	8560	80%	0%	1%		
	3	6403	80%	1%	1%		
	Avg	7144	80%	0%	1%	$ 388.00	$1,385.00
5	1	6795	79%	1%	1%		
	2	5619	80%	0%	0%		
	3	7971	79%	1%	0%		
	Avg	6795	79%	1%	0%	$ 382.00	$1,296.00
6	1	6534	78%	0%	1%		
	2	6077	78%	0%	1%		
	3	7841	82%	0%	0%		
	Avg	6817	79%	0%	1%	$ 382.00	$1,303.00
7	1	6991	78%	0%	1%		
	2	6011	79%	1%	1%		
	3	0			0%		
	Avg	6501	79%	1%	1%	$ 382.00	$1,243.00
8	1	4901	80%	1%	1%		
	2	5489	79%	0%	1%		
	3	0					
	Avg	5195	80%	1%	1%	$ 388.00	$1,007.00
9	1	5293	80%	0%	0%		
	2	6142	77%	1%	1%		
	3	6599	78%	0%	0%		
	Avg	6011	78%	0%	0%	$ 377.00	$1,132.00
10	1	5358	80%	0%	1%		
	2	6273	79%	0%	1%		
	3	7775	80%	1%	0%		
	Avg	6469	80%	0%	1%	$ 388.00	$1,254.00

11	1	6142	79%	0%	1%		
	2	6534	77%	1%	1%		
	3	7449	79%	0%	1%		
	Avg	6708	78%	0%	1%	$ 378.00	$1,268.00
12	1	6011	80%	0%	0%		
	2	0					
	3	8037	80%	0%	1%		
	Avg	7024	80%	0%	1%	$ 388.00	$1,362.00
13	1	5685	79%	0%	1%		
	2	0					
	3	4247	80%	0%	0%		
	Avg	4966	80%	0%	1%	$ 388.00	$ 963.00
14	1	6338	79%	0%	0%		
	2	7057	81%	1%	0%		
	3	6207	80%	0%	0%		
	Avg	6534	80%	0%	0%	$ 386.00	$1,262.00
15	1	6338	79%	1%	0%		
	2	6730	80%	0%	1%		
	3	6469	79%	1%	0%		
	Avg	6512	79%	1%	0%	$ 382.00	$1,242.00
16	1	6861	80%	0%	0%		
	2	6926	78%	0%	1%		
	3	7645	77%	1%	1%		
	Avg	7144	78%	0%	1%	$ 378.00	$1,350.00
17	1	0					
	2	6599	79%	0%	0%		
	3	7253	80%	0%	0%		
	Avg	6926	80%	0%	0%	$ 386.00	$1,338.00
18	1	0					
	2	5815	79%	0%	0%		
	3	5815	79%	1%	1%		
	Avg	5815	79%	0%	1%	$ 382.00	$1,112.00
19	1	7579	79%	0%	0%		
	2	6665	80%	0%	1%		
	3	7122	80%	0%	1%		
	Avg	7122	80%	0%	1%	$ 388.00	$1,381.00

Blanks are human error during season
Runner Type Peanut
Planted 5-5-05
Harvested 10-26-05
Values based on loan price
Plot size: 2 rows X 100 X 3 ft.

Collingsworth & Comanche County Leafspot Legend

Treatment	Product	Timing	Amt/Acre
1	Folicur 3.6 fl	1,3,5,7	.2 #ai
2	Mana TBZ 3.6F	1,3,5,7	0.2
3	Mana TBZ 20EW	1,3,5,7	0.2
4	Equs 720 T6FL Folicur 3.6FL	1, 2, 7 3, 4, 5, 6	.75 #ai 0.2
5	Equs 720 T6 FL Mana-TBZ 3.6 FL	1, 2, 7 3, 4, 5, 6	0.75 0.2
6	Equs 720 SST 6FL Mana-TBZ 20EW	1, 2, 7 3, 4, 5, 6	0.75 0.2
7	Bravo Weasther Stick 6FL Folicur 3.6 FL	1, 2, 7 3, 4, 5, 6	0.75 0.2
8	Echo 720	1-7	1-5 pints
9	Echo 720 Echo 720 + SA-120301	1 2-End 2-End	1.5 pint 1 pint 7 fl oz
10	UTC		
11	Echo 720 JAU 6476 Folicur 3.6 F	1,2, 3, 8 4, 5, 6, 7 4, 5, 6, 7	1.5 pint 2.38 oz 5.3 oz
12	JAU 6476 Echo 720 JAU 6746 Folicur 3.6 F	1 2, 3, 8 4, 5, 6, 7 4, 5, 6, 7	5.7 oz 1.5 pt 2.38 oz 5.3 oz
13	USF 2010 Induce Echo	1, 3, 5 1, 3, 5 2, 4	3.5 oz 0.125 1.5 pt
14	Echo 720 Folicur USF 2010 Folicur	1, 2, 7 3, 5 3, 5 4, 6	1.5 pt 5.2 oz 3.5 oz 7.2 oz
15	Echo 720 Folicur USF 2010 Folicur Echo 720	1, 2, 7 3, 5 3, 5 4, 6 4, 6	1.5 pt 5.2 oz 3.5 oz 7.2 oz 1 pt
16	SPARTA Echo 720	1,2, 4, 6 as needed	7.2 oz 1.5 pt

17	V-10 11650 WD + NIS	1,2, 4, 6 all	0.107 lb ai 0.125
18	V-1011650 WD +NIS	1,2, 4, 6 all	0.054 lb ai 0.125

Collingsworth Leafspot
2005

Treatment	Rep	Yield	% SMK + SS	% Damaged	% Inmature	Value/Ton	Value/Acre
1	1	5748	76%	0%	2%		
	2	5814	78%	1%	2%		
	3	6276	75%	1%	2%		
	Avg	5946	76%	1%	2%	$ 370	$ 1,099
2	1	5219	78%	0%	1%		
	2	6342	75%	0%	2%		
	3	6144	74%	0%	3%		
	Avg	5902	76%	0%	2%	$ 370	$ 1,091
3	1	5748	77%	0%	2%		
	2	6474	79%	0%	1%		
	3	6012	75%	1%	1%		
	Avg	6078	77%	0%	1%	$ 373	$ 1,134
4	1	5880	75%	0%	2%		
	2	6607	73%	1%	2%		
	3	6012	74%	1%	3%		
	Avg	6166	74%	1%	2%	$ 360	$ 1,110
5	1	6276	76%	0%	2%		
	2	6342	77%	0%	1%		
	3	5550	73%	1%	2%		
	Avg	6056	75%	0%	2%	$ 365	$ 1,105
6	1	5616	72%	0%	3%		
	2	5682	72%	1%	3%		
	3	5153	74%	1%	2%		
	Avg	5483	74%	1%	3%	$ 362	$ 991
7	1	6012	76%	0%	2%		
	2	5946	75%	0%	3%		
	3	6541	75%	0%	3%		
	Avg	6166	75%	0%	3%	$ 366	$ 1,130
8	1	5946	79%	0%	1%		
	2	5550	77%	1%	1%		
	3	6276	77%	0%	1%		
	Avg	5924	78%	0%	1%	$ 378	$ 1,120
9	1	6078	79%	0%	0%		
	2	5748	75%	0%	1%		
	3	6673	73%	1%	2%		
	Avg	6166	76%	0%	1%	$ 368	$ 1,136
10	1	5483	76%	0%	2%		
	2	5417	74%	0%	2%		
	3	6408	77%	0%	2%		
	Avg	5770	76%	0%	2%	$ 370	$ 1,067

11	1	5483	75%	0%	2%		
	2	5153	74%	1%	2%		
	3	6541	74%	0%	3%		
	Avg	5726	74%	0%	2%	$ 360	$ 1,031
12	1	5550	73%	0%	2%		
	2	5219	73%	1%	2%		
	3	4294	74%	0%	3%		
	Avg	5021	73%	0%	2%	$ 355	$ 892
13	1	5682	75%	0%	2%		
	2	7267	75%	1%	2%		
	3	7465	76%	1%	3%		
	Avg	6805	75%	1%	2%	$ 365	$ 1,242
14	1	5748	76%	0%	2%		
	2	7664	73%	0%	3%		
	3	6673	75%	1%	3%		
	Avg	6695	75%	0%	3%	$ 362	$ 1,210
15	1	5682	75%	0%	2%		
	2	6541	76%	0%	2%		
	3	6673	75%	0%	2%		
	Avg	6298	75%	0%	2%	$ 365	$ 1,149
16	1	5616	75%	0%	2%		
	2	6408	76%	0%	2%		
	3	6144	78%	0%	1%		
	Avg	6056	76%	0%	2%	$ 370	$ 1,120
17	1	5219	74%	1%	2%		
	2	6474	74%	1%	3%		
	3	6276	71%	0%	3%		
	Avg	5990	73%	1%	3%	$ 357	$ 1,068
18	1	5351	68%	2%	3%		
	2	5946	73%	1%	3%		
	3	5814	75%	0%	3%		
	Avg	5704	72%	1%	3%	$ 352	$ 1,004

Values based on loan price
Runner Type Peanut
Planted 5-10-05
Harvested 10-18-05
Plot size: 2 rows X 100 X 3 ft.

2005 Leaf SpotTrial
Comanche County
Disease Rating

October 4, 2005

Treatment	Product	Rep 1	Rep 2	Rep 3	Average
1	Folicur 3.6 fl	2	1	2	**1.6**
2	Mana TBZ 3.6F	1	1	2	**1.3**
3	Mana TBZ 20EW	2	2	2	**2**
4	Equs 720 T6FL Folicur 3.6 FL	3	1	2	**2**
5	Equs 720 T6FL Mana-TBZ 3.6 FL	2	1	2	**1.6**
6	Equs 720 SST 6FL Mana-TBZ 20EW	4	1	1	**2**
7	Bravo Weasther Stick 6FL Folicur 3.6 FL	4	2	1	**2.3**
8	Echo 720	4	1	2	**2.3**
9	Echo 720 Echo 720 + SA-120301	2	2	1	**1.6**
10	UTC	4	3	2	**3**
11	Echo 720 JAU 6746 Folicur 3.6 F	2	2	3	**2.3**
12	JAU 6476 Echo 720 JAU 6746 Folicur 3.6 F	3	1	2	**2**
13	USF 2010 Induce Echo	2	1	2	**1.6**
14	Echo 720 Folicur USF 2010 Folicur	1	1	1	**1**
15	Echo 720 Folicur USF 2010 Folicur Echo 720	1	1	1	**1**
16	SPARTA Echo 720	2	2	1	**1.6**
17	V-10 11650 WD + NIS	2	1	2	**1.6**
18	V-1011650 WD + NIS	1	1	3	**1.6**

Note: Rating 1 looks very good and 10 is covered with leaf spot.

2005 Leaf SpotTrial
Comanche County

Rhizoctonia Rating

October 13, 2005

Treatment	Product	Rep 1	Rep 2	Rep 3	Average
1	Folicur 3.6 fl	1	1	2	1.3
2	Mana TBZ 3.6F	2	1	4	2.3
3	Mana TBZ 20EW	2	1	3	2.0
4	Equs 720 T6FL Folicur 3.6 FL	2	2	2	2.0
5	Equs 720 T6FL Mana-TBZ 3.6 FL	3	3	2	2.6
6	Equs 720 SST 6FL Mana-TBZ 20EW	3	3	3	3.0
7	Bravo Weasther Stick 6FL Folicur 3.6 FL	3	6	1	3.3
8	Echo 720	2	5	1	2.6
9	Echo 720 Echo 720 + SA-120301	2	2	3	2.3
10	UTC	1	1	1	1.0
11	Echo 720 JAU 6746 Folicur 3.6 F	2	2	2	2.0
12	JAU 6476 Echo 720 JAU 6746 Folicur 3.6 F	2	2	2	2.0
13	USF 2010 Induce Echo	2	1	3	2.0
14	Echo 720 Folicur USF 2010 Folicur	6	1	5	4.0
15	Echo 720 Folicur USF 2010 Folicur Echo 720	4	1	2	2.3
16	SPARTA Echo 720	3	1	2	2.0
17	V-10 11650 WD + NIS	2	1	3	2.0
18	V-1011650 WD + NIS	2	1	2	1.6

Note: Rating 1 looks very good and 10 is covered with Rhizoctonia.

Comanche Leafspot
2005

Treatment	Rep	Yield	% SMK + SS	% Damaged	% Inmature	Value/Ton	Value/Acre	
1	1	5477	70%	3%	3%			
	2	6011	78%	1%	2%			
	3	5878	73%	2%	3%			
	Avg	5789	74%	2%	3%	$ 358.00	$ 1,037.00	
2	1	6412	64%	3%	6%			
	2	5611	74%	1%	2%			
	3	6078	67%	4%	5%			
	Avg	6034	68%	3%	4%	$ 124.00	$ 384.00	Seg II - Excess Damage
3	1	6278	70%	3%	4%			
	2	5544	74%	1%	3%			
	3	5878	68%	3%	4%			
	Avg	5900	71%	2%	4%	$ 345.00	$ 1,018.00	
4	1	5611	70%	1%	3%			
	2	5611	70%	3%	4%			
	3	5744	79%	1%	3%			
	Avg	5655	72%	2%	3%	$ 348.00	$ 985.00	
5	1	5878	74%	1%	2%			
	2	5611	66%	2%	6%			
	3	5744	63%	3%	5%			
	Avg	5744	68%	2%	4%	$ 331.00	$ 949.00	
6	1	5677	69%	3%	3%			
	2	5410	71%	3%	3%			
	3	5878	74%	3%	6%			
	Avg	5655	71%	3%	4%	$ 124.00	$ 352.00	Seg II - Excess Damage
7	1	5076	66%	5%	5%			
	2	5410	68%	4%	5%			
	3	5677	76%	2%	2%			
	Avg	5388	70%	4%	4%	$ 124.00	$ 335.00	Seg II - Excess Damage
8	1	5343	73%	2%	2%			
	2	5477	66%	4%	5%			
	3	5744	76%	0%	3%			
	Avg	5521	72%	2%	3%	$ 348.00	$ 1,001.00	
9	1	5677	68%	5%	5%			
	2	5611	66%	3%	6%			
	3	6011	79%	1%	2%			
	Avg	5766	71%	3%	4%	$ 124.00	$ 359.00	Seg II - Excess Damage
10	1	4609	63%	3%	7%			
	2	4475	72%	3%	2%			
	3	4809	76%	0%	2%			
	Avg	4631	70%	2%	4%	$ 340.00	$ 788.00	
11	1	5343	61%	3%	9%			
	2	5009	72%	2%	4%			
	3	5611	75%	2%	2%			
	Avg	5321	69%	2%	5%	$ 337.00	$ 896.00	

12	1	0						
	2	5944	70%	3%	4%			
	3	6278	79%	1%	1%			
	Avg	6111	75%	2%	3%	$ 343.00	$ 1,049.00	
13	1	5744	68%	3%	4%			
	2	6078	73%	2%	3%			
	3	5544	78%	2%	1%			
	Avg	5789	72%	2%	3%	$ 349.00	$ 1,009.00	
14	1	6078	68%	4%	4%			
	2	6345	68%	2%	5%			
	3	5878	72%	3%	3%			
	Avg	6100	69%	3%	4%	$ 124.00	$ 379.00	Seg II - Excess Damage
15	1	5410	68%	4%	5%			
	2	6212	75%	1%	4%			
	3	6078	75%	4%	2%			
	Avg	5900	73%	3%	4%	$ 124.00	$ 367.00	Seg II - Excess Damage
16	1	5343	68%	2%	4%			
	2	5677	77%	1%	3%			
	3	5277	74%	3%	3%			
	Avg	5432	73%	2%	3%	$ 355.00	$ 965.00	
17	1	5878	64%	4%	7%			
	2	6145	75%	2%	2%			
	3	5611	73%	2%	4%			
	Avg	5878	71%	3%	4%	$ 124.00	$ 366.00	Seg II - Excess Damage
18	1	5677	77%	3%	1%			
	2	6078	78%	1%	2%			
	3	5611	76%	1%	3%			
	Avg	5789	77%	2%	2%	$ 371.00	$ 1,075.00	

Planting Date 5-17-05
Variety - Georgia Greene
Harvest Date: 10-15-05
Values based on loan price
Plot size: 2 rows X 100 X 3 ft.
This plot was designed to rate against leafspot.
In the end, significant Rhizoctonia and Pythium Pod rots
created a lot of problems and Leafspots were very minor.

Erath County Leafspot Legend

Treatment	Product	Timing	Amt/Acre
1	Folicur 3.6 fl	1, 3, 5, 7	.2 #ai
2	Mana TBZ3.6F	1, 3, 5, 7	0.2
3	Mana TBZ 20EW	1, 3, 5, 7	0.2
4	Equs 720 T6FL Folicur 3.6 FL	1, 2, 7 3, 4, 5, 6	.75 #ai 0.2
5	Equs 720 T6FL Mana-TBZ3.6 FL	1, 2, 7 3, 4, 5, 6	0.75 0.2
6	Equs 720 SST 6FL Mana-TBZ 20EW	1, 2, 7 3, 4, 5, 6	0.75 0.2
7	Bravo Weasther Stick 6FL Folicur 3.6 FL	1, 2, 7 3, 4, 5, 6	0.75 0.2
8	UTC		
9	Echo 720 JAU 6476 Folicur 3.6 F	1, 2, 3, 8 4, 5, 6, 7 4, 5, 6, 7	1.5 pint 2.38 oz 5.3 oz
10	JAU 6476 Echo 720 JAU 6746 Folicur 3.6 F	1 2, 3, 8 4, 5, 6, 7 4, 5, 6, 7	5.7 oz 1.5 pt 2.38 oz 5.3 oz
11	USF 2010 Induce Echo	1, 3, 5 1, 3, 5 2, 4	3.5 oz 0.125 1.5 pt
12	Echo 720 Folicur USF 2010 Folicur	1, 2, 7 3, 5 3, 5 4, 6	1.5 pt 5.2 oz 3.5 oz 7.2 oz
13	Echo 720 Folicur USF 2010 Folicur Echo 720	1, 2, 7 3, 5 3, 5 4, 6 4, 6	1.5 pt 5.2 oz 3.5 oz 7.2 oz 1 pt
14	SPARTA Echo 720	1, 2, 4,6 as needed	7.2 oz 1.5 pt

2005 Leaf SpotTrial
Erath County

Disease Rating

September 28, 2005

Treatment	Product	Rep 1	Rep 2	Rep 3	Average
1	Folicur 3.6 fl	5	7	6	**6**
2	Mana TBZ3.6F	6	10	7	**7.6**
3	Mana TBZ 20EW	3	5	2	**3.3**
4	Equs 720 T6FL Folicur 3.6 FL	3	5	5	**4.3**
5	Equs 720 T6FL Mana-TBZ3.6 FL	3	3	5	**3.6**
6	Equs 720 SST 6FL Mana-TBZ 20EW	2	2	1	**1.6**
7	Bravo Weasther Stick 6FL Folicur 3.6 FL	3	2	4	**3**
8	UTC	9	8	10	**9**
9	Echo 720 JAU 6476 Folicur 3.6 F	2	1	4	**2.3**
10	JAU 6476 Echo 720 JAU 6746 Folicur 3.6 F	1	1	3	**1.6**
11	USF 2010 Induce Echo	2	2	3	**2.3**
12	Echo 720 Folicur USF 2010 Folicur	2	2	3	**2.3**
13	Echo 720 Folicur USF 2010 Folicur Echo 720	2	1	2	**1.6**
14	SPARTA Echo 720	1	4	1	**2**

Note: Rating 1 looks very god and 10 is covered with leafspot.

Erath Leafspot
2005

Treatment	Rep	Yield	% SMK + SS	% Damaged	% Inmature	Value/Ton	Value/Acre
1	1	1895	80%	0%	2%		
	2	1830	78%	0%	1%		
	3	1830	75%	0%	2%		
	Avg	1851	78%	0%	2%	$ 379.00	$ 351.00
2	1	2091	78%	0%	2%		
	2	1437	75%	1%	3%		
	3	1960	77%	1%	2%		
	Avg	1830	77%	1%	2%	$ 375.00	$ 343.00
3	1	1960	76%	0%	1%		
	2	2287	76%	1%	2%		
	3	2548	75%	2%	1%		
	Avg	2265	76%	1%	1%	$ 368.00	$ 417.00
4	1	2026	75%	1%	3%		
	2	2614	75%	1%	2%		
	3	2091	77%	0%	1%		
	Avg	2243	76%	1%	2%	$ 370.00	$ 415.00
5	1	2483	78%	1%	1%		
	2	1960	78%	0%	2%		
	3	2548	75%	1%	2%		
	Avg	2330	77%	1%	2%	$ 375.00	$ 436.00
6	1	2744	77%	0%	2%		
	2	1634	72%	0%	5%		
	3	2744	74%	2%	2%		
	Avg	2374	74%	1%	3%	$ 362.00	$ 429.00
7	1	1634	77%	1%	1%		
	2	2026	79%	1%	3%		
	3	2418	76%	1%	2%		
	Avg	2026	77%	1%	2%	$ 375.00	$ 380.00
8	1	1437	77%	1%	2%		
	2	1437	79%	0%	3%		
	3	653	74%	1%	3%		
	Avg	1176	77%	1%	3%	$ 376.00	$ 221.00
9	1	2548	75%	1%	2%		
	2	3071	77%	1%	2%		
	3	2483	75%	1%	1%		
	Avg	2701	76%	1%	2%	$ 370.00	$ 499.00
10	1	2418	77%	1%	2%		
	2	2744	73%	0%	4%		
	3	2352	75%	0%	3%		
	Avg	2505	75%	0%	3%	$ 366.00	$ 459.00

11	1	1960	76%	1%	2%		
	2	1634	75%	0%	2%		
	3	2026	76%	0%	2%		
	Avg	1873	76%	0%	2%	$ 370.00	$ 346.00
12	1	1568	75%	0%	3%		
	2	2222	76%	0%	2%		
	3	2483	76%	1%	2%		
	Avg	2091	76%	0%	2%	$ 370.00	$ 387.00
13	1	2222	74%	0%	4%		
	2	2679	76%	0%	3%		
	3	2614	76%	0%	2%		
	Avg	2505	75%	0%	3%	$ 366.00	$ 459.00
14	1	2287	77%	1%	3%		
	2	2614	73%	2%	3%		
	3	2679	76%	0%	2%		
	Avg	2526	75%	1%	3%	$ 366.00	$ 463.00

Values based on loan price
Variety TAM Run-96
Planted 5-6-05
Harvest 10-17-05
Plot size: 2 rows X 100 X 3 ft.

WEED CONTROL IN TEXAS PEANUT PRODUCTION

W. James Grichar[1], Peter A. Dotray[2], and Todd A. Baughman[3]

OVERALL SUMMARY OF WEED CONTROL PROGRAMS IN 2005

Weed science related studies were conducted in the various peanut growing regions of the state. These studies addressed two main areas: peanut tolerance and peanut weed management systems. Many of the most troublesome weeds in peanut were studied to determine which herbicide systems were most efficacious. Most of these studies were conducted because of the support of the Texas Peanut Producers Board with only minimal support from private industry. Many of these studies are reported in the following pages of this report. This report is divided into two parts with a discussion on weed research in south Texas and another on those studies in the Texas High and Rolling Plains.

INTRODUCTION

Weeds continue to be a major concern for most peanut producers in the state. These concerns will likely increase because of the need to reduce input costs due to the high fuel prices expected in 2006. Weeds compete with the peanut plant for moisture, nutrients, and sunlight throughout the growing season. Because of the low growing nature of peanuts, weeds that germinate early and are not controlled will cause problems later in the growing season. Covering peanuts and weeds with soil during cultivation is not practical and can lead to more problems. Weed removal is extremely difficult once they have become established in the peanut row. After peanut and weeds achieve some growth, mechanical removal with tractor-mounted cultivators is impossible. Hand-weeding is difficult, costly, and unrealistic under modern day conditions. Consequently, peanut growers have readily accepted chemical weed control practices. During digging and combining operations, under weedy conditions, the peanut pods can become detached from the peanut vines and are left on the soil surface. These detached peanut pods cannot be recovered with current mechanized harvesting equipment. Peanut growers applied preplant incorporated and preemergence herbicides to control annual grasses and broadleaf weeds. Postemergence herbicides are applied to control hard-to-kill or escaped weeds. Due to major differences in environmental and soil characteristics, problem weeds vary from region to region.

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MATERIAL AND METHODS

Field experiments were conducted using traditional small plot techniques. Plot sizes ranged from 2 rows by 25 to 50 ft to 4 rows by 30 feet. Herbicides were applied with a CO_2 backpack sprayer or tractor-mounted compressed air sprayer. Carrier water volumes ranged from 10 to 20 gallons per acre. Visual weed control and peanut injury ratings were made at various intervals during the growing season on a scale of 0 = no weed control or peanut injury to 100 = complete control or peanut death. In some experiments, peanuts were dug, combined, cleaned, and weighed for yield and grade comparisons.

RESULTS AND DISCUSSION

Part One: South Texas

Weed Control Using Cadre and Pursuit in combination with 2,4-DB, Storm, and Ultra Blazer. Studies were undertaken to evaluate the effects on weed control when Cadre and Pursuit was applied at one-half and full rates in combination with three commonly used broadleaf herbicides 2,4-D, Storm, and Ultra Blazer (Table 1).

Eclipta (*Eclipta prostrate*) control was best when Storm was applied alone or in combination with Cadre. Ultra Blazer, 2,4-D, or Pursuit alone failed to control eclipta while Cadre alone controlled greater than 75%. Cadre at a full rate plus 2,4-D controlled 86% eclipta.

Palmer amaranth control was actually better with Pursuit alone (85-95%) than Cadre (60-70%). The addition of the three broadleaf herbicides to Cadre improved control to at least 83% (except when Storm was added to the ½ rate of Cadre); however, no increase in control was noted when these herbicides were added to Pursuit. Storm and 2,4-DB alone controlled greater than 90% Palmer amaranth while Ultra Blazer alone controlled 57%.

Smellmelon (*Cucumis melo* L.) control was greater than 90% when Cadre was used at the ½ X rate (.72 oz/A) or the full rate (1.44 oz/A) alone or in combination with 2,4-DB, Storm, or Ultra Blazer (Table 1). Only Pursuit at the full rate plus Ultra Blazer controlled smellmelon as well as Cadre. Pursuit alone at the ½ X or full rate controlled only 20 and 65% smellmelon, respectively (Table 1). The addition of Ultra Blazer to the ½ X rate of Pursuit improved smellmelon control to 83% while 2,4-DB or Storm combinations with the ½ X rate of Pursuit controlled no greater than 75%. When the full rate of Pursuit was used, the addition of 2,4-DB improved control to 82% while Pursuit alone or in combination with Storm controlled no greater than 68%. Storm and 2,4-DB alone controlled less than 50% smellmelon while Ultra Blazer alone controlled 89%.

Only Cadre treatments which included 2,4-DB, Storm, or Ultra Blazer or the full rate (1.44 oz/A) of Cadre alone controlled at least 86% horse purslane (*Trianthema portulacastrum* L.) (Table 1). Cadre at the ½ X rate or Pursuit at the ½ X or full rate failed to provide acceptable horse purslane control (≤70%). Storm and Ultra Blazer alone controlled horse purslane at least 93% while 2,4-DB alone controlled only 65%.

Smellmelon, Horse Purslane, and Palmer Amaranth Control with Soil-applied Herbicides. These weeds are difficult to control with POST herbicides alone; therefore, studies to determine effective control measures with soil-applied herbicides alone or followed by POST herbicide applications were initiated.

Smellmelon control was at least 88% with Prowl applied preplant incorporated (PPI) followed by 2,4-DB, Cadre, or Ultra Blazer applied postemergence (POST) (Table 2). Prowl, Valor, Pursuit, Dual Magnum, or Outlook applied PPI or PRE alone controlled less than 60% smellmelon while combinations of Prowl plus Valor, Pursuit, Dual Magnum, or Strongarm provided at least 70% control. When Prowl applied PPI was followed by POST applications of the full-rate of Cadre or Pursuit, smellmelon control was at least 73%. A split-rate of Cadre applied 3 weeks apart following Prowl applied PPI provided 96% control.

Prowl alone controlled 73% horse purslane while combinations of Prowl plus Pursuit, Strongarm, and Dual Magnum provided at least 83% control (Table 2). Dual Magnum and Outlook alone controlled no greater than 70% smellmelon while Valor alone controlled 57 to 92% depending on the rate. Prowl followed by Valor applied preemergence (PRE) controlled 50% horse purslane. Prowl followed by a POST application of 2,4-DB, Pursuit, Cadre, Ultra Blazer or Cobra controlled at least 85%.

Prowl alone controlled less than 65% Palmer amaranth while all other herbicide treatments except Prowl followed by Outlook applied PRE or Prowl followed by Basagran or Strongarm applied POST controlled 90% (Table 2).

Smellmelon, Horse purslane, and Palmer Amaranth Control with POST Herbicides. These three broadleaf weeds continue to be a problem in many peanut fields in the south Texas growing region. Studies were initiated to study the effects of commonly used postemergence (POST) broadleaf herbicides when applied to weeds less than 6 inch tall (early postemergence [EPOST]) or weeds 10 to 12 inch tall (late postemergence [LPOST]).

Strongarm, 2,4-DB, and Ultra Blazer controlled smellmelon better when applied EPOST than LPOST (Table 3). Pursuit and Basagran failed to control smellmelon (< 65% control) with either application timing. Cadre and Cobra controlled smellmelon at least 86% when applied either EPOST or LPOST.

Only Cobra applied EPOST or LPOST provided effective (99%) control of horse purslane (Table 3). Ultra Blazer applied EPOST controlled 88% while none of the other herbicides provided better than 33% control when applied EPOST or LPOST.

All POST herbicides except Strongarm or Basagran controlled Palmer amaranth equally well (at least 96%) when applied EPOST or LPOST (Table 3). Strongarm controlled Palmer amaranth better when applied LPOST while Basagran controlled Palmer amaranth better with an EPOST application (Table 3).

Weed Control, Peanut Injury, and Yield When Using Aim and ET Herbicides. Aim and ET are contact herbicides similar to Paraquat that are being evaluated for use in peanuts. FMC has applied for a label for Aim in peanut and we have not had the opportunity to do much research with either herbicide. These herbicides are in the PPO family of herbicides and studies were undertaken to determine weed efficacy and peanut tolerance. Aim and ET, at four rates, were applied at three different times during the growing season in a weedy area and in another area kept weed-free with Prowl applied PPI, to evaluate weed control and peanut response independent of weed pressure.

Both Aim and ET effectively controlled tall waterhemp (at least 98%) when applied at peanut cracking but did not effectively control tall waterhemp with 28 and 56 day after cracking applications (Table 4). Southern crabgrass was not controlled when rated 4 weeks after any herbicide application. Since neither of these herbicides have any residual activity, late-season ratings would not have shown any effective control. Under weed-free conditions, both herbicides caused peanut injury in the form of chlorosis and necrosis when rated 7 days after herbicide application. Peanut injury was worse with the cracking and 28 days after cracking applications of Aim or ET compared with the 56 days after cracking application (Table 4). Peanut yields were highest with Aim at 0.5 oz/A applied at cracking and 28 days after cracking or ET at 1.0 oz/A applied at cracking.

Weed Control and Peanut Tolerance to Gramoxone. Gramoxone has been used extensively over the years for weed control in the southeast but has never been used in the southwest peanut production area. Studies were conducted during the 2005 growing season to study weed control and peanut tolerance to Gramoxone Inteon which is a new Gramoxone formulation.

Peanut leaf burn and stunting was similar with Gramoxone Max and Gramoxone Inteon (Table 5). Horse purslane control was less than 70% with either formulation alone but increased to at least 86% when Basagran and Dual Magnum were added to Gramoxone Max or Inteon. Under heavy yellow nutsedge pressure (Pearsall location), control was no better than 60% with any herbicide treatment. Under moderate nutsedge pressure (Yoakum location), the addition of Basagran and Dual Magnum improved control to greater than 90% when rated late season. This may be an option for yellow nutsedge control since Dual will provide residual control while Gramoxone will provide early season knock-down control. Peanut yields were reduced with Gramoxone Max at 0.66 pt/A. This herbicide treatment also resulted in 24 % peanut burn and 32% peanut stunting (Table 5).

Peanut Response to Classic. Classic is used in the southeast for weed control but is not used in the southwest because of concerns of yield reductions due to injury. Under weed-free conditions, no visible stunt was seen on peanuts with any Classic application. Although peanut yields and grades were not always statistically reduced from the untreated check, numerically, peanut yields and grades from Classic treatments were less than the weed-free check (Table 6).

Peanut Tolerance to Prowl H_2O. Many peanut growers have become familiar with the new formulation of Prowl that was released on a limited basis during the 2005 growing season. This formulation should be safe on peanuts and studies were initiated to study peanut tolerance to Prowl H_2O when applied up to 7 days after cracking. Only the 2.0 pt/A rate applied at peanut cracking resulted in an yield reduction from the weed-free check (Table 7). No differences in peanut grade were noted. This yield reduction was unexpected and studies will continue in 2006 to try to determine if this was just a chance occurrence or if there is some validity to the reduction.

Peanut Tolerance to Cobra. Studies from the Virginia-Carolina peanut production area have voiced concerns about the possibility of Cobra causing a reduction in peanut yield when applied at certain times during the growing season. When Cobra was applied 3 week after planting and sequentially at 15, 30, 45 or 60 days later no difference in peanut yield and grade were noted between any Cobra treatments and the untreated check (Table 8).

Variety response to Aim, Cobra, and ET Applied Postemergence. Three peanut cultivars were evaluated for yield and grade response to Cobra, Aim, or ET under weed-free conditions (Table 9). No yield reductions were noted with the three peanut varieties when using any of the above mentioned herbicides. Yield response was related to variety as both OL-01 and OL-02 outyielded T-96 (Table 9). Also, in many instances T-96 resulted in lower grades than the two other varieties.

Controlling Volunteer Peanuts with Cotton Herbicides. With the increase in the past few years of a crop rotation in south Texas of cotton following peanuts, we have had more questions about controlling volunteer peanuts in cotton. Studies were initiated to determine response of six peanut cultivars to commonly used POST cotton herbicides. Cultivars used included: Carver, OL02, Hull, Tamrun 96, Georgia 02C, and Georgia 01R. Plots were rated 1, 2, and 4 weeks after herbicide application for peanut injury and death. The response of peanuts to the herbicides gradually increased over time and culminated in maximum injury approximately 4 weeks after herbicides were applied.

No differences in peanut cultivar response were noted; therefore, data were combined over varieties and presented by herbicide treatment (Table 10). Ignite provided the quickest kill (97%) while Roundup at 12 fl oz/A controlled peanut 68% when rated 1 week after treatment. Herbicides which provided at least 95% peanut death when rated 4 weeks after treatment included Roundup at 24 and 36 fl oz/A, Roundup at 24 fl oz/A applied 3 plus 5 weeks after peanuts were planted, Ignite at 32 and 40 fl oz/A, Envoke at 0.1 and 0.15 oz/A, and the mixture of Direx plus MSMA. Cotoran, and Buctril alone controlled less than 50% peanut while the tank mixture of Cotoran plus MSMA controlled 84 %.

Part Two: High and Rolling Plains

Peanut Tolerance to Aim and ET. In 2004, Spartan 4F (chemical name sulfentrazone) was registered for use in the southeast (Alabama, Georgia, North Carolina, South Carolina, Virginia, and Mississippi). Research from south and west Texas indicated that this herbicide injured peanut 50 to 80%. FMC received a federal label for this product, but the label excludes states like Texas where significant injury has been observed. Aim (chemical name carfentrazone) is labeled for use in peanut when applied under a hood. Both sulfentrazone and carfentrazone belong in the PPO family of herbicides. Until 2004, little university data had been collected on the use of Aim postemergence-topical in peanut. Field experiments were conducted in 2005 to evaluate Aim and ET (chemical name pyraflufen-ethyl). ET is another PPO inhibitor manufactured by Nichino America that may be available in the future for use in peanut. At AG-CARES in 2005, Aim and ET were applied at 1.5 and 2.0 ounces per acre. Applications were made 51 and 119 days after planting (DAP). Paraquat and 2,4-DB were used for comparison purposes. Peanut injury was evaluated after each application and yield and quality determined at the end of the growing season. In order to ensure that any plant injury, yield, and quality loss was the result of a herbicide treatment, plots were maintained weed-free.

Visual injury was observed following Aim and ET applied early postemergence (EP) regardless of rate (Table 11). Injury 14 days after EP treatments ranged from 17 to 30% following Aim applications and 27 to 38% following ET applications. All peanut injury decreased over time, but was still visible at harvest (2 to 6%). Visual injury following Aim and ET applied 119 DAP ranged from 9 to 13% and 12 to 16%, respectively. Peanut yield and grade was not affected by either herbicide or timing of application. These results suggest that visual injury following Aim and ET applied early season is much greater than applications made late season. Although significant visual did occur, no yield loss occurred.

Weed Control and Peanut Tolerance to Full and Reduced Rate Sequential Applications of Cadre, Pursuit, and Strongarm. Cadre and Pursuit are registered for use postemergence in west Texas peanut production. They have good activity on a broad-spectrum of weeds including annual grass and broadleaf weeds and nutsedge. In recent years, growers have expressed concern that these herbicides no longer provide season-long weed control. In light of this concern, growers are delaying applications or using reduced rate sequential applications. The objective of this research was to examine peanut tolerance and season-long weed control following full and reduced rate sequential applications of Cadre, Pursuit, and Strongarm.

Cadre at 1.44 oz/A applied early-postemergence (EP) injured peanut 12% early-season, but this injury decreased to 3% late-season (September 15) (Table 12). Pursuit at 1.44 oz/A and Strongarm at 0.3 oz/A applied EP caused as much as 9 and 13% injury, respectively. Similar injury was observed following each herbicide applied MP. Reduced rate sequential applications of Pursuit caused similar injury when compared to full rates applied EP or MP, but a reduced rate sequential application of Cadre and Strongarm caused as much as or greater injury when compared to full rates applied EP or MP. Late-season peanut injury following reduced rate sequential applications of Cadre exceeded 10%. Late-season yellow nutsedge control following Pursuit applications ranged from 70 to 89% (Table 13). Reduced rate sequential applications of Pursuit controlled yellow nutsedge 89%, which was greater than the full rate applied EP or MP.

Late-season yellow nutsedge control following Cadre applications ranged from 94 to 99% and were similar regardless of application timing. Strongarm applied EP and reduced rates applied in sequential applications controlled yellow nutsedge 86 to 89%, which was greater than the control achieved following Strongarm applied MP (62%). Peanut yield following herbicide treatments ranged from 5429 to 6015 lb/A and were not different than the non-treated control (5497 lb/A) (Table 12). These results suggest that reduced rate sequential applications of Pursuit and Strongarm may provide late-season yellow nutsedge control compared to full rates applied MP; however, late-season yellow nutsedge control was similar for Cadre regardless of application timing.

Peanut Tolerance to Cobra under Weed-Free Conditions. Cobra (lactofen) is a new postemergence peanut herbicide that was available for use in the 2005 growing season. It may be applied at 12.8 ounces per application and up to two applications may be made per year. Cobra application cannot be made until the peanuts have reached the 6-leaf stage. It has activity on several annual broadleaf weeds including Palmer amaranth (carelessweed) and annual morningglory. Cobra is classified as a contact herbicide, which means that weed size at application is important for effective weed control. Peanut tolerance to Cobra is based on the plants ability to metabolize the herbicide, which often times results in leaf necrosis after application. This type of injury is similar to that observed when Ultra Blazer is used. The objective of this study was to examine peanut tolerance to Cobra under weed-free conditions.

Peanut injury following Cobra at 12.5 ounces applied at 6-leaf peanut was as great as 28% on July 15, and decreased to 6% near harvest (Table 14). Other single applications made throughout the season injured peanut as much as 22%. A sequential application of Cobra at 6-leaf followed by applications made 15, 30, 45, and 60 days later caused up to 33% injury mid-season. Near harvest (Sept 20), no peanut injury exceeded 8%. Peanut yield ranged from 3761 to 4661 pounds per acre (lb/A) and were not different from the untreated control (4243 lbs/A). These results suggest that Cobra will burn peanut leaves after single and sequential treatments, but no yield loss should result from these applications.

Yellow Nutsedge Control and Peanut Tolerance to Dual. Dual Magnum is registered for use in peanut and cotton (except Gaines County). It has activity on annual grasses, small-seeded broadleaf weeds, and yellow nutsedge. When applied preemergence (PRE), Dual has been reported to stunt peanut growth. Previous research by Grichar et al. suggested that peanut is more tolerant to Dual when applied postemergence (POST) and control of yellow nutsedge may still be achieved. The objective of this research was to examine peanut response and yellow nutsedge control following Dual applied PRE, early-POST (EP), and mid-POST (MP) at the full rate (21 oz/A) and following reduced rates (10.6 oz/A) applied in sequential applications.

Dual PRE at 21 oz/A injured peanut 37% early-postemergence (Table 15). This injury was still apparent on September 15 (12%). Dual applied at 21 oz/A EP and MP injured peanut up to 18 and 2%, respectively. Reduced rate applications of Dual PRE followed by (fb) EP or MP injured peanut up to 25 and 30%, respectively. Dual PRE controlled yellow nutsedge 97% early-season (Table 16). This control decreased to 82% late-season (September 15). Dual EP controlled yellow nutsedge 81%, but Dual MP did not effectively control yellow nutsedge by late-season (18%). Dual PRE fb Dual MP controlled yellow nutsedge 83%, but Dual PRE fb Dual EP did not effectively control yellow nutsedge late-season (68%). Peanut yield in the Dual Magnum-treated plots did not differ from the yield collected in the non-treated plots (5667 lb/A) (Table 15). This research indicated that Dual PRE may stunt peanut significantly regardless of rate. Dual applied EP controlled yellow nutsedge as effective as Dual applied PRE.

Peanut Tolerance to Prowl and Sonalan. Prowl 3.3 EC (pendimethalin) and Sonalan 3 EC (ethalfluralin) are two dinitroaniline herbicides registered for use in peanut. Recent interest in reduced till and no-till systems has raised questions about rates and methods of incorporation when using the dinitroaniline herbicides. In cotton, Prowl and Treflan (trifluralin) may be surface applied followed by water incorporation or they may be used in chemigation applications. In peanut, there is interest to use Prowl and Sonalan in a similar manner. Peanut tolerance to dinitroaniline herbicides that were mechanically incorporated has been studied in the past; however, little information exists regarding peanut tolerance to these herbicides when applied preemergence and incorporated by irrigation. The objective of this research was to examine peanut tolerance to Prowl and Sonalan at 2, 3, and 4 pints and incorporated immediately with irrigation water. All plots were kept weed-free to insure that any visual injury or yield reduction could be attributed to the herbicide treatment and not weed competition. This was the third and final year of this study.

In 2005, Sonalan at 4 pints caused up to 5% peanut injury (Table 17). This injury was greater than or equal to all other treatments. Canopy height and width was not affected by any herbicide treatment. Peanut yield ranged from 4825 to 5667 pounds per acre and was not affected by any herbicide treatment (Table 17). In 2004, Prowl at 4 pints caused up to 8% visual peanut injury on Jun 10, but this injury decreased to 3% near the end of the growing season. Sonalan at 3 and 4 pints injured peanut early and mid-season (4 to 8%), but no injury was observed at harvest. Sonalan at 4 pints reduced canopy width mid-season, but no canopy reduction was observed at harvest.

Plots treated with Prowl or Sonalan produced 5376 to 6369 pounds per acre and were not different compared to the untreated check, which yielded 5992 pounds per acre (Table 17). In 2003, no visual peanut injury or canopy width reductions were observed throughout the growing season following Prowl or Sonalan applied at any rate when compared to the untreated check. Plots treated with Prowl or Sonalan produced 4041 to 4809 pounds per acre and were not reduced when compared to the untreated check, which yielded 4011 pounds per acre. According to the current Sonalan label, this herbicide can not be chemigated in peanut, but mechanical incorporation is allowed. Prowl EC is labeled for mechanical incorporation, chemigation (0.5 to 0.75 inches of water during the first sprinkler set), and surface applications followed by 0.5 to 0.75-inches of water. Prowl H_2O, which was not used in this test, may be applied preplant incorporated, through chemigation, and applied preemergence in peanuts grown under overhead irrigation. These results (2003-2005) indicate Prowl and Sonalan may be safely applied and incorporated by irrigation water without yield loss. Currently, only Prowl may be applied in this manner.

Peanut Tolerance to Prowl H_2O. Prowl H_2O is a new formulation of pendimethalin that is registered for use preplant incorporated, preplant surface, preemergence (PRE), early postemergence, at lay-by, and in chemigation systems. In peanut, Prowl H_2O may be applied PPI and PRE (if under an overhead irrigation system). Compared to Prowl EC formulation, Prowl H_20 is more water soluble and should be easier to incorporate into the soil using water following application. The objective of this study was to examine peanut tolerance to Prowl H_20 applied PRE, at-crack (AC), 4 days after crack (DAC), and 7 DAC under weed free conditions. Prowl EC was applied PRE for comparison.

Peanut injury following Prowl H_20 at 2 pints did not exceed 4% regardless of time of application (Table 18). Prowl H_20 at 3 pints injured peanut 4 to 9% when applied 4 and 7 DAC, but no other injury was observed. No injury was observed following Prowl EC applied PRE. At harvest, no peanut injury was observed following any treatment. Peanut yield ranged from 4110 to 5157 pounds per acre (lb/A) and was different from the Prowl EC (4757 lb/A) and the untreated control (4666 lb/A) treatments. This was the first year of a two year study, but initial results suggest that Prowl H_2O may be safely used in peanut.

Controlling Volunteer Peanuts in Cotton with Cotton Herbicides. Spanish peanut is a short season peanut relative to the other market types. It is a viable option in environments with reduced heat units and is a good option in replant and recrop situations. The objective of this research was to examine peanut tolerance to herbicides applied preemergence (PRE) in cotton prior to cotton failure. Peanut was planted into the existing beds (no tillage between cotton and peanut planting) or planted into rebedded cotton ground. Cotton was planted on May 10 and the following herbicides were applied at planting: Prowl, Staple, Dual Magnum, Caparol, or Caparol plus Staple. The cotton was terminated using paraquat on June 1. The Spanish variety Tamspan 90 was planted on June 7. Regardless of tillage after the initial crop destruct, peanut injury following Prowl and Caparol did not exceed 10%. Peanut injury following Staple in untilled plots ranged from 52 to 72% early to mid-season, and decreased to 18% on September 20.

In plots where beds were reworked, Staple injured peanut 47 to 63% early and mid-season, and 15% on September 20 (Table 19). The reduced rate of Staple plus Caparol injured peanut similar to or less than the full rate of Staple regardless of tillage between plantings (15 to 48% in the stale seedbed plots and 6 to 37% in the rebedded plots). Peanut yield in the stale seedbed plots was reduced 14% in plots treated with Staple, compared to non-treated plot which produced 3425 lb peanut per acre. No differences in yield were noted in plots that received tillage between plantings relative to the non-treated control. Peanut yield ranged from 2507 to 3111 lb/A. Results of this test indicate that Spanish peanut can be safely replanted into ground treated with Prowl, Dual Magnum, or Caparol, but not when Staple had been applied. Peanut injury was not affected by tillage.

Peanut Tolerance and Weed Control with Gramoxone Inteon. Gramoxone Inteon is the new paraquat dichloride formulation for grass and broadleaf weed control and for use as a harvest aid. It still carries the "Danger" signal word and the skull and cross bones symbol on the label, but it is less toxic to humans compared to the older formulations. In peanut, Gramoxone Inteon is labeled for use from ground crack to 28 days after ground crack. The use rate ranges from 8 to 16 oz/A, but no more than 2 applications per season and not more than 16 oz/acre/season may be applied. Studies were conducted in

2005 to examine peanut tolerance to Gramoxone Inteon applied 3 days after crack (DAC), 7 DAC, and 10 DAC.

At AG-CARES, Gramoxone Inteon was applied 7 DAC under weed-free conditions. Peanut injury ranged from 2 to 6% when evaluated 7 days after treatment (DAT). Injury ranged from 0 to 6% when evaluated 14 and 21 DAT. Injury was most severe following Gramoxone Inteon at 0.25 and 0.1875 lb ai/A (16 and 12 ounces of product). At 27 DAT, Gramoxone Inteon injured peanut 11%, but no visible injury was observed late season. Peanut yield ranged from 5463 to 5749 lb/A and no differences were observed between the non-treated and treated plots (Table 20).

When Gramoxone Inteon was applied at 10 DAC at a second location southwest of Lamesa, peanut injury ranged from 0 to 22% when evaluated 7 DAT. Injury at 14 and 21 DAT ranged from 0 to 27% and 0 to 18%, respectively. Injury was most severe following Gramoxone Inteon at 16 oz/A followed by Gramoxone Inteon at 12 oz/A. Initial ivyleaf morningglory control ranged from 82 to 97%, but control declined over time since Gramoxone Inteon does not have soil activity and annual morningglory will emerge throughout the growing season. Ivyleaf morningglory control 21 DAT ranged from 60 to 78% (Table 21).

At a third location, Gramoxone Inteon was applied 3 DAC. Peanut injury was most severe following a tank mix of Gramoxone Inteon and Dual Magnum, but this injury did not exceed 8% (Table 22).

Peanut Response to Classic. Classic herbicide is recommended in Alabama, Florida, Georgia, North and South Carolina, and Virginia for the control of Florida beggarweed and for suppression of bristly starbur. There is no label for use of Classic in Texas peanut. The objective of this study was to examine peanut tolerance to Classic applied according to the current label (rates, timings, tank mixes). All Classic treatments caused peanut injury (Table 23). Peanut was injured as much as 30% following Classic alone or in tank mix with 2,4-DB applied at 60 days after crack (DAC). This injury consisted of chlorotic and stunted plants. Late-season peanut injury was as great as 20% from Classic applications made 60 DAC. Less visual injury was noted following Classic applied at 74 and 88 DAC. Peanut yield was reduced following Classic plus 2,4-DB at 60 DAC and following Classic at 88 DAC.

Variety response to Aim, Cobra, and ET Applied Postemergence. Differences in varietal tolerance to herbicides has been studied since 2000 when we first observed that Flavor Runner 458 might be more susceptible to Strongarm applied preemergence (PRE) compared to other runner type varieties. In 2004, Valor at 6 ounces (twice the recommended label rate) injured Flavor Runner 458 as much or more than other varieties tested. In 2005, we examined varietal tolerance of GP-1, Tamrun OL02, and Flavor Runner 458 to three herbicides applied postemergence (Cobra, Aim, and ET). Cobra at 12.5 ounces, Aim at 1.0 and 2.0 ounces, and ET at 1.0 and 2.0 ounces were applied 51 days after planting. Two weeks after application, Aim at 2.0 ounces and both rates of ET injured peanut 20 to 52% (Table 24). This injury occurred in all varieties and was greater than injury observed from Cobra (12.5 ounces) and Aim at 1.0 ounce. Injury decreased over time and no injury exceeded 6% late-season. In GP-1, Aim at 2.0 ounces and both rates of ET reduced peanut yield relative to the non-treated control. In OL02, Aim and ET at 1.0 ounces reduced peanut yield. No herbicide reduced yield in Flavor Runner 458 relative to the non-treated control. This data suggests that Flavor Runner 458 is not more susceptible to Cobra, Aim, and ET applied POST, although previous research has shown that it was more susceptible to Strongarm and Valor applied PRE.

Texas panicum control with POST herbicides. Two weeks after the first postemergence (POST) application, Poast Plus at 36 oz and Select at 8 oz controlled Texas panicum at least 87% (Table 25). Less control was observed following Poast Plus at 24 oz (70%) and Cadre (72%). Two weeks after the second POST application, Poast Plus followed by (fb) Poast Plus and Select fb Select controlled Texas panicum 99%. Select (8 oz) and Poast Plus (36 oz) applied once controlled Texas panicum at least 92%. On August 16, the sequential applications of Select or Poast Plus controlled this weed 94 and 89%, respectively. Poast Plus (36 oz) or Select (6 or 8 oz) alone controlled Texas panicum at least 78%. No other herbicide treatment was effective at controlling this weed.

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Table 1. Weed control using Cadre and Pursuit in combination with 2,4-DB, Storm, and Ultra Blazer.

		Weed control (%)			
Herbicide treatment [1]	Rate Product/A	Eclipta	Palmer amaranth	Smellmelon	Horse purslane
Cadre	0.72 oz	85	60	92	53
Cadre + 2,4-DB	0.72 oz + 1.2 pt	63	87	96	88
Cadre + Storm	0.72 oz + 1.5 pt	88	68	93	94
Cadre + Ultra Blazer	0.72 oz + 1.5 pt	27	83	99	86
Cadre	1.44 oz	77	70	100	95
Cadre + 2,4-DB	1.44 oz + 1.2 pt	86	95	99	88
Cadre + Storm	1.44 oz + 1.5 pt	76	83	99	96
Cadre + Ultra Blazer	1.44 oz + 1.5 pt	47	98	97	97
Pursuit	0.72 oz	27	95	20	70
Pursuit + 2,4-DB	0.72 oz + 1.2 pt	33	97	62	88
Pursuit + Storm	0.72 oz + 1.5 pt	40	72	75	90
Pursuit + Ultra Blazer	0.72 oz + 1.5 pt	30	77	83	60
Pursuit	1.44 oz	47	85	65	65
Pursuit + 2,4-DB	1.44 oz + 1.2 pt	50	93	82	90
Pursuit + Storm	1.44 oz + 1.5 pt	60	42	68	57
Pursuit + Ultra Blazer	1.44 oz + 1.5 pt	47	75	95	87
2,4-DB	1.2 pt	52	96	28	65
Storm	1.5 pt	83	94	48	98
Ultra Blazer	1.5 pt	50	57	89	93
LSD (0.05)		44	27	17	39

[1] Agridex at 1.0 qt/A added to all herbicide treatments.

Table 2. Late-season smellmelon, horse purslane and Palmer amaranth control in peanut with soil-applied herbicides.

Herbicide[1]	Rate Product/ A	Application timing[2]	Control (%)[3] Smellmelon	Horse purslane	Palmer amaranth
Check	-	-	0	0	0
Prowl	2.4 pt	PPI	23	73	63
Valor	2.0 oz	PRE	33	92	100
Valor	3.0 oz	PRE	33	57	90
Prowl	2.4 pt	PPI	72	50	100
+ Valor	3.0 oz	PRE			
Pursuit	1.44 oz	PRE	40	64	100
Prowl	2.4 pt	PPI	78	99	100
+ Pursuit	1.44 oz	PRE			
Prowl	2.4 pt	PPI	73	92	100
+ Strongarm	0.45 oz				
Dual Magnum	1.3 pt	PRE	53	70	100
Outlook	1.4 pt	PRE	57	26	95
Prowl	2.4 pt	PPI	70	83	100
+ Dual Magnum	1.3 pt	PRE			
Prowl	2.4 pt	PPI	67	76	85
+ Outlook	1.4 pt	PRE			
Prowl	2.4 pt	PPI	94	100	97
+ 2,4-DB	1.2 pt	POST			
Prowl	2.4 pt	PPI	76	95	100
+ Pursuit	1.44 oz	POST			
Prowl	2.4 pt	PPI	73	100	100
+ Cadre					
Prowl	2.4 pt	PPI	96	97	100
+ Cadre	0.72 oz	POST			
+ Cadre	0.72 oz	+ 3 WK			
Prowl	2.4 pt	PPI	88	97	100
+ Ultra Blazer	1.5 pt	POST			
Prowl	2.4 pt	PPI	68	85	87
+ Basagran	2.0 pt	POST			
Prowl	2.4 pt	PPI	37	98	100
+ Cobra	0.8 pt	POST			
Prowl	2.4 pt	PPI	60	78	88
+ Strongarm	0.3 oz	POST			
LSD (0.05)			23	28	19

[1]POST applications of 2,4-DB, Ultra Blazer, Basagran, and Cobra included Agridex at 1.0 qt/A; Cadre and Pursuit included X-77 and Strongarm included Kinetic at 0.25% v/v.
[2]Abbreviations: PPI, preplant incorporated; PRE, preemergence; POST, postemergence.
[3]Smellmelon and Palmer amaranth ratings taken on 12 Sept while horse purslane ratings taken on 8 Aug.

Table 3. Late-season smellmelon, horse purslane, and Palmer amaranth control in peanut with POST herbicides.

Herbicide[1]	Rate Product/A	Application timing[2]	Control (%)[3] Smellmelon	Horse purslane	Palmer amaranth
Strongarm	0.45 oz	EP	70	20	77
		LP	40	10	98
2,4-DB	1.2 pt	EP	75	20	96
		LP	58	0	100
Pursuit	1.44 oz	EP	63	27	100
		LP	58	3	99
Cadre	1.44 oz	EP	86	33	100
		LP	93	20	100
Ultra Blazer	2.0 pt	EP	90	88	99
		LP	78	47	100
Cobra	0.8 pt	EP	87	99	99
		LP	89	99	100
Basagran	2.0 pt	EP	40	9	99
		LP	28	0	69
LSD (0.05)			27	33	21

[1]Strongarm, 2,4-DB, Ultra Blazer, Cobra, and Basagran included Agridex at 1 qt/A. Cadre and Pursuit included X-77 at 0.25% v/v.
[2]EP, early postemergence, weeds no greater than 6 inch tall; LP, late postemergence, weeds 18 to 24 inch tall.
[3]Smellmelon and Palmer Amaranth ratings taken 3 weeks after LP application while horse purslane taken 1 week after LP application.

Table 4. Weed control, peanut injury and yield when using Aim and ET herbicides.

Herbicide[2]	Rate Product/A	Application timing[3]	Control (%)[1] Palmer amaranth	Southern crabgrass	Peanut injury(%)[4]	Yield Lbs/A
Check	-	-	0	0	0	2296
Aim	0.5 oz	Crack	100	0	22	3817
Aim	1.0 oz	Crack	100	0	27	2526
Aim	1.5 oz	Crack	93	0	33	2710
Aim	2.0 oz	Crack	100	0	40	2968
ET	0.5 oz	Crack	95	3	12	3116
ET	1.0oz	Crack	95	0	17	4056
ET	1.5 oz	Crack	98	0	23	3337
ET	2.0 oz	Crack	97	20	25	3061
Gramoxone	1.0 pt	Crack	65	67	42	2895
Aim	0.5 oz	28 DAC	43	0	32	1991
Aim	1.0 oz	28 DAC	53	0	28	3375
Aim	1.5 oz	28 DAC	40	0	28	3135
Aim	2.0 oz	28 DAC	23	0	25	3227
ET	0.5 oz	28 DAC	33	0	23	3651
ET	1.0 oz	28 DAC	30	3	27	2914
ET	1.5 oz	28 DAC	37	0	30	3392
ET	2.0 oz	28 DAC	13	7	25	3337
Gramoxone	1.0 pt	28 DAC	42	27	40	2582
Aim	0.5 oz	56 DAC	0	0	7	3393
Aim	1.0 oz	56 DAC	33	0	8	2508
Aim	1.5 oz	56 DAC	57	0	13	2674
Aim	2.0 oz	56 DAC	63	0	17	1752
ET	0.5 oz	56 DAC	27	0	9	2766
ET	1.0 oz	56 DAC	58	0	13	2250
ET	1.5 oz	56 DAC	40	0	20	3005
ET	2.0 oz	56 DAC	7	0	22	2766
2,4-DB	1.6 pt	56 DAC	37	0	0	2241
LSD (0.05)			5	3	3	1225

[1] Weed ratings taken approximately 4 wk after last herbicide application.
[2] Aim, ET, and 2,4-DB applications included Agridex at 1.0 qt/A. Gramoxone treatments included Basagran at 0.5 pt/A plus Kinetic at 0.25% v/v.
[3] Abbreviations: CRACK, at peanut cracking approximately 7 to 10 days after planting; DAC, days after peanut cracking.
[4] Peanut injury ratings taken approximately 1-5 days after herbicide application.

Table 5. Weed control and peanut tolerance to Gramoxone[1].

Treatments	Rate Pt/A	Peanut Burn (%) Pearsall	Peanut Burn (%) Yoakum	Peanut Stunt (%) Yoakum	Control (%)[2] Horse purslane	Control (%)[2] Yellow nutsedge[3] P	Control (%)[2] Yellow nutsedge[3] Y	Control (%)[2] Southern crabgrass	Yield Lbs/A
Gramoxone Max[4]	0.33	4	6	19	68	20	75	78	3282
Gramoxone Max	0.50	3	9	17	65	27	72	58	3134
Gramoxone Max	0.66	4	24	32	40	30	60	60	2249
Gramoxone Max	0.33	3	5	7	60	35	50	50	3319
Basagran	1.0								
Gramoxone Max	0.33	2	13	17	86	57	93	100	3927
Basagran	1.0								
Dual Magnum	1.3								
Gramoxone Inteon	0.5	4	11	8	42	23	62	68	3098
Gramoxone Inteon	0.66	3	16	20	33	43	63	63	2471
Gramoxone Inteon	1.0	4	10	15	57	33	57	57	3208
Gramoxone Inteon	0.5	6	9	12	60	42	60	60	3614
Basagran	1.0								
Gramoxone Inteon	0.5	2	10	12	100	60	100	100	4278
Basagran	1.0								
Dual Magnum	1.3								
Check -	0	0	0	0	0	0	0	0	3817
LSD (0.05)		4	8	10	36	26	26	28	1049

[1]Prowl applied preplant incorporated at 1.0 qt/A.
[2]Rating index for all factors: 0=no control or injury, 100=complete control or plant death.
[3]Two locations for yellow nutsedge control data: P=Pearsall, Y=Yoakum.
[4]X-77 added to all treatments at the rate of 0.25% v/v.

Table 6. Peanut response to Classic in south Texas.

Treatment[1]	Rate/A	Application timing[2]	Yield Lbs/A	Grade SMK+SS(%)
Check	-	-	3757	71.8
Pursuit	1.44 oz	3 WAP	2685	66.5
Classic	0.031 lb	67 DAP		
Classic	0.031 lb	67 DAP	2985	70.0
Classic	0.031 lb	67 DAP	3469	71.0
Bravo Weather-Stik	1.5 pt			
Classic	0.031 lb	67 DAP	2916	67.3
2,4-DB	1.0 pt			
Pursuit	1.44 oz	3 WAP	3515	68.7
Classic	0.031 lb	81 DAP		
Classic	0.031 lb	81 DAP	2985	70.8
Classic	0.031 lb	81 DAP	2765	68.7
Bravo Weather-Stik	1.5 pt			
Classic	0.031 lb	81 DAP	3180	67.8
2,4-DB	1.0 pt			
Pursuit	1.44 oz	3 WAP	2581	65.0
Classic	0.031 lb	95 DAP		
Classic	0.031 lb	95 DAP	2547	67.5
Classic	0.031 lb	95 DAP	3227	65.8
Bravo Weather-Stik	1.5 pt			
Classic	0.031 lb	95 DAP	2777	65.7
2,4-DB	1.0 pt			
LSD (0.05)			994	5.6

[1] Agridex added to Pursuit at the rate of 1.0 qt/A. Non-ionic surfactant added at the rate of 0.25% v/v.
[2] Abbreviations: WAP=weeks after planting, DAP=days after planting.

Table 7. Peanut tolerance to Prowl H_2O applied at various timings.

Treatment	Rate/A	Application timing[1]	Yield Lbs/A	Grade SMK+SS (%)
Check	-	-	2563	70.0
Prowl 3.3 EC	2.4 pt	PRE	2190	72.2
Prowl H_2O	2.0 pt	PRE	2452	71.8
Prowl H_2O	3.0 pt	PRE	2414	72.3
Prowl H_2O	2.0 pt	CRACK	1932	67.3
Prowl H_2O	3.0 pt	CRACK	2388	68.0
Prowl H_2O	2.0 pt	4 DAC	2388	70.8
Prowl H_2O	3.0 pt	4 DAC	2259	70.2
Prowl H_2O	2.0 pt	7 DAC	2337	68.5
Prowl H_2O	3.0 pt	7 DAC	2620	71.2
LSD (0.05)			425	NS

[1]Abbreviations: PRE = preemergence; CRACK= peanut ground cracking; DAC = days after cracking.

Table 8. Peanut tolerance to Cobra applied at various timings.

Treatment	Rate/A	Application timing[1]	Yield Lbs/A	Grade SMK+SS (%)
Check	-	-	2271	74.8
Cobra	12.5 fl oz	3 WAP	2225	71.3
Cobra Cobra	12.5 fl oz 12.5 fl oz	3 WAP + 15 D	2202	72.7
Cobra	12.5 fl oz	15 D	2225	71.8
Cobra Cobra	12.5 fl oz 12.5 fl oz	3 WAP + 30 D	2878	73.3
Cobra	12.5 fl oz	30 D	2661	76.5
Cobra Cobra	12.5 fl oz 12.5 fl oz	3 WAP + 45 D	2007	73.0
Cobra	12.5 fl oz	45 D	2684	74.7
Cobra Cobra	12.5 fl oz 12.5 fl oz	3 WAP + 60 D	2236	71.2

Cobra	12.5 fl oz	60 D	2615	74.8
LSD (0.05)			944	5.0

[1]Abbreviations: WAP = weeks after planting; D = days after 3 WAP application.

Table 9. Variety response to Aim, Cobra, and ET applied postemergence.

		Peanut variety					
		Yield (Lbs/A)			Grade (%SMK+SS)		
Treatment	Rate Product/A	T-96	OL-01	OL-02	T-96	OL-01	OL-02
Check	-	2650	3666	4719	68	69	69
Cobra	12.5 fl oz	2977	3884	4380	63	69	70
Aim	1.0 fl oz	2837	3570	4078	70	70	70
Aim	2.0 fl oz	2456	2710	4078	65	67	68
ET	1.0 fl oz	2372	4102	4104	69	71	71
ET	2.0 fl oz	2751	4477	4296	70	72	70
LSD (0.05)			704			5	

Table 10. Controlling volunteer peanuts in cotton with herbicides.

			Peanut control (%)		
Herbicide treatment[1]	Rate (Product/A)	Application[2]	1 WAT[2]	2 WAT	8 WAT
Check	-	-	0	0	0
MSMA	24 fl oz	3 WAP	6	38	64
Roundup Ultra	12 fl oz	3 WAP	68	74	79
Roundup Ultra	24 fl oz	3 WAP	96	97	96
Roundup Ultra	36 fl oz	3 WAP	98	98	100
Roundup Ultra	24 fl oz	3+5WAP	97	97	100
Roundup + Valor	24 fl oz +1.0 oz	3 WAP	90	82	92
Ignite	32 fl oz	3 WAP	97	98	100
Ignite	40 fl oz	3 WAP	98	99	99
Caparol	32 fl oz	3 WAP	80	76	29
Cotoran	32 fl oz	3 WAP	68	68	23
Direx	32 fl oz	3 WAP	93	92	85

Linex	32 fl oz	3 WAP	93	88	83
Envoke	0.1 oz	3 WAP	74	83	97
Envoke	0.15 oz	3 WAP	67	85	98
Supprend	1.25 lb	3 WAP	87	87	62
Supprend	1.50 lb	3 WAP	90	89	74
Buctril	16 fl oz	3 WAP	58	52	43
Buctril	24 fl oz	3 WAP	60	55	30
Cotoran + MSMA	32 + 24 fl oz	3 WAP	65	70	84
Direx + MSMA	32 + 24 fl oz	3 WAP	97	97	98
LSD (0.05)			2	3	8

[1] POST applications of MSMA, Caparol, Cotoran, Direx, Linex, Supprend, and Buctril included Agridex at 1.0 qt/A while Envoke included Induce at 0.25% v/v.
[2] Abbreviations: WAT,weeks after initial herbicide application; WAP, weeks after planting.

Table 11. Peanut injury and yield as affected by AIM and ET applied early- (EP) and late-postemergence (LP).

Treatment	Timing	Rate (lb ai/A)	Rate (oz/A)	Peanut Injury (%) Jun 29	Jul 15	Aug 10	Sep 6	Sep 20	Yield (lb/A)	Grade (%)
Non-treated	—	---	---	0	0	0	0	0	4255	69
AIM + COC	EP	0.024 + 1%	1.5	17	20	7	6	4	4780	70
AIM + COC	EP	0.032 + 1%	2.0	30	31	12	7	5	4736	70
ET + COC	EP	0.00234 + 0.5%	1.5	27	31	10	6	2	4119	69
ET + COC	EP	0.00313 + 0.5%	2.0	38	38	13	10	6	4434	68
Gramoxone Max + Basagran + NIS	EP	0.1875 + 0.25 + 0.25%	8 + 8	10	23	6	5	0	4660	70
AIM + COC	LP	0.024 + 1%	1.5	--	--	--	9	0	4599	69
AIM + COC	LP	0.032 + 1%	2.0	--	--	--	13	3	3999	68
ET + COC	LP	0.00234 + 0.5%	1.5	--	--	--	12	0	4344	69
ET + COC	LP	0.00313 + 0.5%	2.0	--	--	--	16	5	4104	69
2,4-DB +	LP	0.40 +	25.6	--	--	--	7	0	3864	68

COC		1%								
CV				28	9	29	19	56	11	2
LSD (0.10)				4	2	2	2	2	NS	NS

Table 12. Peanut injury as affected by early- (EP) and mid-postemergence (MP) applications of Pursuit, Cadre, and Strongarm herbicides.								
Treatment	Timing	Rate	Rate	Peanut Injury (%)				Yield
		(lb ai/A)	(prod./A)	Jun 22	Jul 7	Aug 17	Sep 15	(lb/A)
Non-treated	---	---	---	0	0	0	0	5497
Pursuit + Fertilizer + COC	EP	0.063 + 1.25% + 1%	1.44	9	7	5	6	6015
Pursuit + Fertilizer + COC	MP	0.063 + 1.25% + 1%	1.44	0	9	2	2	5742
Pursuit + Fertilizer + COC fb Pursuit + Fertilizer + COC	EP fb MP	0.032 +1.25% + 1% fb 0.032 + 1.25% + 1%	0.72 fb 0.72	6	11	2	3	5660
Cadre + COC	EP	0.063 + 1%	1.44	12	12	3	3	5947
Cadre + COC	MP	0.063 + 1%	1.44	0	12	6	7	5657
Cadre + COC fb Cadre + COC	EP fb MP	0.032 + 1% fb 0.032 + 1%	0.72 fb 0.72	8	18	10	12	5429
Strongarm + COC	EP	0.016 + 1%	0.3	2	13	0	5	5470
Strongarm + COC	MP	0.016 + 1%	0.3	0	13	0	0	5728
Strongarm + COC fb Strongarm + COC	EP fb MP	0.008 + 1% fb 0.008 + 1%	0.15 fb 0.15	3	17	5	6	5810
CV								11
LSD (0.10)				3	5	2	4	894

Abbreviations: EP, early-postemergence; COC, crop oil concentrate; fb, followed by; mid-postemergence (MP).

Table 13. Yellow nutsedge control as affected by early- (EP) and mid-postemergence (MP) applications of Pursuit, Cadre, and Strongarm herbicides.							
Treatment	Timing	Rate	Rate	Yellow nutsedge control (%)			
		(lb ai/A)	(prod./A)	Jun 22	Jul 7	Aug 17	Sep 15
Non-treated	---	---	---	0	0	0	0
Pursuit + Fertilizer + COC	EP	0.063 + 1.25% + 1%	1.44	80	88	68	70
Pursuit + Fertilizer + COC	MP	0.063 + 1.25% + 1%	1.44	0	62	70	70
Pursuit + Fertilizer + COC fb Pursuit + Fertilizer + COC	EP fb MP	0.032 + 1.25% + 1% fb 0.032 + 1.25% + 1%	0.72 fb 0.72	75	95	91	89
Cadre + COC	EP	0.063 + 1%	1.44	98	98	99	99
Cadre + COC	MP	0.063 + 1%	1.44	0	63	99	94
Cadre + COC fb Cadre + COC	EP fb MP	0.032 + 1% fb 0.032 + 1%	0.72 fb 0.72	96	97	99	98
Strongarm + COC	EP	0.016 + 1%	0.3	80	93	88	86
Strongarm + COC	MP	0.016 + 1%	0.3	0	78	72	62
Strongarm + COC fb Strongarm + COC	EP fb MP	0.008 + 1% fb 0.008 + 1%	0.15 fb 0.15	82	93	95	89
CV				6	8	4	6
LSD (0.10)				5	9	5	7

Abbreviations: EP, early-postemergence; COC, crop oil concentrate; fb, followed by; mid-postemergence

Table 14. Peanut injury and yield as affected by Cobra herbicide at AG-CARES, Lamesa TX in 2005 [a].											
Treatment	Timing	Rate	Peanut Injury (%)								Yield
		(lb ai/A)	Jun 9	Jun 17	Jun 29	Jul 15	Aug 2	Aug 16	Aug 30	Sep 20	(lb/A)
Non-treated	---	---	0	0	0	0	0	0	0	0	4243
Cobra [b] + COC	6 LF	0.2 + 1%	8	17	20	28	13	10	8	6	4753
Cobra + COC fb Cobra + COC	6 LF fb 15 DAT	0.2 + 1% fb 0.2 + 1%	7	17	22	30	14	9	9	6	4438
Cobra + COC	15 DAT	0.2 + 1%	0	0	13	22	14	5	6	4	4661
Cobra + COC fb Cobra + COC	6 LF fb 30 DAT	0.2 + 1% fb 0.2 + 1%	7	17	15	33	13	10	11	7	4453
Cobra + COC	30 DAT	0.2 + 1%	0	0	0	18	13	5	9	4	4872
Cobra + COC fb Cobra + COC	6 LF fb 45 DAT	0.2 + 1% fb 0.2 + 1%	8	15	18	28	14	10	11	8	3973
Cobra + COC	45 DAT	0.2 + 1%	0	0	0	0	15	7	9	6	3761
Cobra + COC fb Cobra + COC	6 LF fb 60 DAT	0.2 + 1% fb 0.2 + 1%	7	18	20	25	15	9	11	7	4332
Cobra + COC	60 DAT	0.2 + 1%	0	0	0	0	16	9	11	6	3929
CV			8	23	22	11	37	14	26	29	13
LSD $_{(0.10)}$			0.5	3	3	3	7	2	3	2	NS

[a]Abbreviations: 6 LF = 6 leaf
fb = followed by
COC = crop oil concentrate
[b]Cobra at 0.2 lb ai/A = 12.8 fluid ounces/acre

Table 15. Peanut injury as affected by Dual Magnum applied preemergence, early- and mid-postemergence.

Treatment	Timing	Rate	Rate	Peanut Injury (%)					Yield
		(lb ai/A)	(prod./A)	Jun 2	Jun 22	Jul 7	Aug 17	Sep 15	(lb/A)
Non-treated	---	---	---	0	0	0	0	0	5667
Dual Magnum 7.62	PRE	1.27	21.3	37	32	25	15	12	5721
Dual Magnum 7.62 fb Dual Magnum 7.62	PRE fb EP	0.635 fb 0.635	10.6 fb 10.6	25	23	22	7	8	5213
Dual Magnum 7.62	EP	1.27	21.3	0	18	15	2	4	5398
Dual Magnum 7.62 fb Dual Magnum 7.62	PRE fb MP	0.635 fb 0.635	10.6 fb 10.6	27	30	20	7	5	5699
Dual Magnum 7.62	MP	1.27	21.3	0	0	2	0	0	6466
CV									13
LSD $_{(0.10)}$				5	5	7	4	6	1103

Abbreviations: EP, early-postemergence; fb, followed by; mid-postemergence (MP).

Table 16. Yellow nutsedge control as affected by Dual Magnum applied preemergence, early- and mid- postemergence.

Treatment	Timing	Rate	Rate	Yellow nutsedge control (%)				
		(lb ai/A)	(prod./A)	Jun2	Jun 22	Jul 7	Aug 17	Sep 15
Non-treated	---	---	---	0	0	0	0	0
Dual Magnum 7.62	PRE	1.27	21.3	97	86	93	89	82
Dual Magnum 7.62 fb Dual Magnum 7.62	PRE fb EP	0.635 fb 0.635	10.6 fb 10.6	86	92	95	80	68
Dual Magnum 7.62	EP	1.27	21.3	0	78	87	82	81
Dual Magnum 7.62 fb Dual Magnum 7.62	PRE fb MP	0.635 fb 0.635	10.6 fb 10.6	88	84	83	87	83
Dual Magnum 7.62	MP	1.27	21.3	0	0	15	23	18
CV				7	7	8	8	20
LSD (0.10)				4	6	7	7	17

Abbreviations: EP, early-postemergence; fb, followed by; mid-postemergence (MP).

Table 17. Peanut injury and yield as affected by Prowl and Sonalan applied preemergence and activated by 0.50-inch of irrigation immediately after application in 2005.

Treatment	Rate	Rate	Peanut Injury (%)				Canopy Height (in.)	Canopy Width(in.)	Yield
	(lb ai/A)	(prod./A)	Jun 2	Jun 17	Jul 15	Sep 20	Jun 2	Jun 2	(lb/A)
Non-treated	---	---	0	0	0	0	3.7	4.2	4825
Prowl 3.3 EC	0.825	2 pints	0	0	0	0	3.3	4.1	5231
Prowl 3.3 EC	1.24	3 pints	0	0	0	0	3.4	3.9	5472
Prowl 3.3 EC	1.65	4 pints	2	3	0	0	3.4	3.8	5667
Sonalan 3 EC	0.75	2 pints	0	0	0	0	3.4	3.8	5020
Sonalan 3	1.125	3 pints	0	4	0	0	3.5	4.1	5096

EC									
Sonalan 3 EC	1.5	4 pints	5	4	0	3	3.4	3.9	5050
CV									7
LSD (0.10)			2	NS	NS	2	NS	NS	NS

Table 18. Peanut injury and yield as affected by Prowl H_2O applied postemergence in peanut.

Treatment	Timing	Rate (prod./A)	Peanut Injury (%)					Canopy Width (in.) Jun 2	Yield (lb/A)
			May 26	Jun 2	Jun 17	Jul 15	Sep 20		
Non-treated	---	---	0	0	0	0	0	4	4666
Prowl 3.3 EC	PRE	2.4 pints	0	0	0	0	0	4	4757
Prowl H_2O 3.8	PRE	2 pints	0	0	0	0	0	4	4802
Prowl H_2O 3.8	PRE	3 pints	0	0	0	0	0	4	4080
Prowl H_2O 3.8	AC	2 pints	0	0	0	0	0	4	5374
Prowl H_2O 3.8	AC	3 pints	0	0	0	0	0	4	5043
Prowl H_2O 3.8	4 DAC	2 pints	0	0	0	0	0	4	5178
Prowl H_2O 3.8	4 DAC	3 pints	0	0	4	0	0	4	4953
Prowl H_2O 3.8	7 DAC	2 pints	0	0	3	4	0	4	4546
Prowl H_2O 3.8	7 DAC	3 pints	0	0	9	6	0	3	4110
CV								10	14
LSD (0.10)			---	---	3	1	---	NS	NS

Table 19. Peanut recrop tolerance and yield following cotton herbicides applied preemergence before crop failure at AG-CARES, Lamesa TX in 2005.

Treatment	Tillage after crop destruct	Rate lb/A	Rate (Prod/A)	Peanut Injury (%)				Yield (lb/A)
				Jun 20	Jul 5	Aug 2	Sep 20	
Untreated	none	—	---	0	0	0	0	3425
Prowl 3.3 EC	none	0.5	1.2 pt	0	0	3	0	3649
Staple 85 WP	none	0.063	1.2 oz	52	72	53	18	2944
Dual Magnum 7.62 EC	none	1.0	1 pt	3	7	10	0	3895

Caparol 4 L	none	0.8	1.6 pt	0	0	10	0	3940
Caparol + Staple	none	0.8 + 0.032	1.6 pt + 0.6 oz	28	48	37	15	3492
CV				35	45	66	65	8
LSD (0.10)				7	14	18	5	397
Untreated	yes	---	---	0	0	0	0	3111
Prowl 3.3 EC	yes	0.5	1.2 pt	0	0	7	0	2820
Staple 85 WP	yes	0.063	1.2 oz	47	63	47	15	2507
Dual Magnum 7.62 EC	yes	1.0	1 pt	7	2	3	5	2451
Caparol 4 L	yes	0.8	1.6 pt	0	0	8	0	3111
Caparol + Staple	yes	0.8 + 0.032	1.6 pt + 0.6 oz	23	37	17	6	2518
CV				28	38	59	58	21
LSD (0.10)				5	10	12	4	NS

Table 20. Peanut injury as affected by Gramoxone Inteon applied 7 DAC at Lamesa, TX. in 2005.

Treatment	Rate	Rate	Peanut injury %					Yield lbs/A
	(lb ai/A)	(oz./A)	May 26	Jun 2	Jun 9	Jun 17	Sep 20	
Non-treated	---	---	0	0	0	0	0	5463
Gramoxone Inteon + NIS	0.125 + 0.25%	8	5	2	0	0	0	5749
Gramoxone Inteon + NIS	0.1875 + 0.25%	12	6	4	0	0	0	5614
Gramoxone Inteon + NIS	0.25 + 0.25%	16	6	6	6	11	0	5629
Gramoxone Inteon + Basagran + NIS	0.125 + 0.5 + 0.25%	8 + 16	2	0	0	0	0	5554
Gramoxone Inteon + Basagran + Dual Magnum	0.125 + 0.5 + 1.27	8 + 16 + 21.3	2	1	0	0	0	5524
CV								7
LSD (0.10)			1	1	1	2	NS	NS

Table 21. Peanut injury and ivyleaf morningglory control as affected by Gramoxone Inteon applied 10 DAC at Lamesa, TX. in 2005.

Treatment	Rate (lb ai/A)	Rate (oz./A)	Peanut Injury %	Morning-glory control %	Peanut Injury %	Morning-glory control %	Peanut Injury %	Morning-glory control %
			Jun 9	Jun 9	Jun 17	Jun 17	Jun 23	Jun 23
Non-treated	---	---	0	0	0	0	0	0
Gramoxone Inteon + NIS	0.125 + 0.25%	8	4	82	8	67	9	62
Gramoxone Inteon + NIS	0.1875 + 0.25%	12	13	88	18	75	14	66
Gramoxone Inteon + NIS	0.25 + 0.25%	16	22	97	27	90	18	78
Gramoxone Inteon + Basagran + NIS	0.125 + 0.5 + 0.25%	8 + 16	0	68	0	55	0	60
Gramoxone Inteon + Basagran + Dual Magnum	0.125 + 0.5 + 1.27	8 + 16 + 21.3	5	96	0	82	0	78
LSD $_{(0.10)}$			2	10	3	7	2	10

Table 22. Peanut injury as affected by Gramoxone Inteon applied 3 DAC at Tokio, TX. in 2005.

Treatment	Rate (lb ai/A)	Rate (oz./A)	Peanut injury %	
			Jun 22	Jul 7
Non-treated	---	---	0	0
Gramoxone Inteon + NIS	0.125 + 0.25%	8	0	0
Gramoxone Inteon + NIS	0.1875 + 0.25%	12	2	0
Gramoxone Inteon + NIS	0.25 + 0.25%	16	3	2
Gramoxone Inteon + Basagran + NIS	0.125 + 0.5 + 0.25%	8 + 16	2	0
Gramoxone Inteon + Basagran + Dual Magnum	0.125 + 0.5 + 1.27	8 + 16 + 21.3	2	8
LSD $_{(0.10)}$			NS	2

Table 23. Peanut injury and yield as affected by Classic herbicide at AG-CARES, Lamesa TX in 2005.								
Treatment		Rate (lb ai/A)	Rate oz. (prod./A)	Peanut Injury (%)				Yield (lb/A)
				Jul 26	Aug 9	Aug 23	Sep 20	
Non-treated	---	---	---	0	0	0	0	5042
Pursuit fb Classic + NIS	6 LF fb 60 DAC	0.063 fb 0.0078 + 0.125%	1.44 fb 0.5	30	28	22	17	4697
Pursuit fb Classic + NIS	6 LF fb 74 DAC	0.063 fb 0.0078 + 0.125%	1.44 fb 0.5	5	22	17	8	4996
Pursuit fb Classic + NIS	6 LF fb 88 DAC	0.063 fb 0.0078 + 0.125%	1.44 fb 0.5	5	6	6	3	4756
Classic + NIS	60 DAC	0.0078 + 0.125%	0.5	30	28	23	14	4260
Classic + Bravo Weatherstik + NIS	60 DAC	0.0078 + 1.125 + 0.125%	0.5 + 24	23	23	14	7	4485
Classic + 2,4-DB + NIS	60 DAC	0.0078 + 0.2 + 0.125%	0.5 +12.8	30	27	25	20	3974
Classic + NIS	74 DAC	0.0078 + 0.125%	0.5	0	14	10	6	4710
Classic + Bravo Weatherstik + NIS	74 DAC	0.0078 + 1.125 + 0.125%	0.5 + 24	0	10	12	5	5146
Classic + 2,4-DB + NIS	74 DAC	0.0078 + 0.2 +0.125%	0.5+ 12.8	0	15	12	6	4577
Classic + NIS	88 DAC	0.0078 + 0.125%	0.5	0	0	2	3	3965
Classic + Bravo Weatherstik + NIS	88 DAC	0.0078 + 1.125 + 0.125%	0.5 + 24	0	0	2	0	4755
Classic + 2,4-DB + NIS	88 DAC	0.0078 + 0.2 + 0.125%	0.5 + 12.8	0	0	5	3	4186
CV				17	15	26	40	16

LSD (0.10)				2	3	4	4	999

Table 24. Peanut varietal tolerance to post herbicides at AG-CARES, Lamesa TX in 2005.								
Variety	Herbicide	Rate	Rate oz.	Peanut Injury (%)				Yield
		(lb/A)	(prod./A)	Jun 29	Jul 15	Aug 10	Sep 20	(lb/A)
Flavor Runner 458	none	---	---	0	0	0	0	4515
Flavor Runner 458	Cobra + COC	0.2 + 1%	12.8	6	15	0	0	4482
Flavor Runner 458	Aim + COC	0.016 + 1%	1.0	7	30	4	3	4422
Flavor Runner 458	Aim + COC	0.032 + 1%	2.0	32	36	11	4	4540
Flavor Runner 458	ET + COC	0.00156 + 0.5%	1.0	27	42	6	3	4529
Flavor Runner 458	ET + COC	0.00313 + 0.5%	2.0	52	50	13	6	4229
CV				14	10	26	35	7
LSD (0.10)				4	4	2	1	414
GP-1	none	---	---	0	0	0	0	4541
GP-1	Cobra + COC	0.2 + 1%	12.8	4	15	4	0	4734
GP-1	Aim + COC	0.016 + 1%	1.0	18	22	5	2	4331
GP-1	Aim + COC	0.032 + 1%	2.0	28	34	13	3	4198
GP-1	ET + COC	0.00156 + 0.5%	1.0	20	36	11	4	4229
GP-1	ET + COC	0.00313 + 0.5%	2.0	30	40	11	4	4167
CV				6	9	13	54	4
LSD (0.10)				2	3	1	2	220
Tamrun OL 02	none	---	---	0	0	0	0	4467
Tamrun OL 02	Cobra + COC	0.2 + 1%	12.8	6	15	0	0	4525

Tamrun OL 02	Aim + COC	0.016 + 1%	1.0	17	25	5	2	4093
Tamrun OL 02	Aim + COC	0.032 + 1%	2.0	28	25	9	3	4185
Tamrun OL 02	ET + COC	0.00156 + 0.5%	1.0	28	30	7	1	3930
Tamrun OL 02	ET + COC	0.00313 + 0.5%	2.0	47	44	14	6	4286
CV				9	8	17	56	5
LSD (0.10)				3	3	1	1	294

Table 25. Texas panicum control in peanut as affected by postemergence applications at Lamesa, TX in 2005.

Treatment	Timing	Rate	Rate	Texas panicum control %			
		(lb ai/A)	(oz./A)	Jul 5	Jul 19	Aug 2	Aug 16
Non-treated	---	---	---	0	0	0	0
Poast Plus + COC	Post 1	0.1875 + 1%	24	70	73	67	42
Poast Plus + COC	Post 1	0.2813 +1%	36	90	93	83	80
Poast Plus + COC fb	Post 1 fb	0.2813 + 1% fb	36 fb 24	90	99	92	89
Poast Plus + COC	Post 2	0.1875 + 1%					
Select + COC	Post 1	0.0938 + 1%	6	82	90	82	78
Select + COC	Post 1	0.125 + 1%	8	88	92	83	80
Select + COC fb	Post 1 fb	0.125 + 1% fb	8 fb 6	87	99	98	94
Select + COC	Post 2	0.0938 + 1%					
Cadre + COC	Post 1	0.063 + 1%	1.44	72	58	15	18
CV				6	8	9	14
LSD (0.10)				6	9	8	12

Report: TPPB
Funding Project: 2005 Broadcast versus Banded Fungicide Applications
Date: June 3, 2006
Cooperator: CropDocs Inc., Justin Tuggle, Ph.D.

Project Purpose:
The purpose of this paper was to confirm the successful use of both the commercial “targeted” fungicides on the disease activity zone (pod zone) in field situations and to support the 2004 work conducted for the Texas Peanut Producers Board on small plots using the same methodology. The further purpose of this project is to save producers money and reduced non-target effects of fungicides to beneficial populations of other fungi by targeting the application of all fungicides.

Abstract:
Commercial fungicides are used to control both soil borne and foliar diseases in peanut. The use of fungicides is recommended as broadcast in field situations by the companies producing the products. The work conducted in this project and the 2004 project was to confirm a theory and practice conducted by CropDocs consulting staff and the former DeLeon Peanut Company Technical Consulting staff of “targeting” fungicides to the zone of activity. Specifically, foliar fungicides were banded on the foliage only and fungicides that were used for soil borne disease were targeted to the pod zone only. Full recommended rates of each fungicide were used in the “targeted zone” for the surface area present. Results from 2005 confirmed that control, as observed by disease activity in the field, damage present in the kernels at grading, and yield, was successful in the practice of “targeting” fungicides to the area of activity at full recommended rates in those surface areas.

Methods:
In 2005, in excess of 100 fields were observed and data was recorded on disease incidence (presence in the field or increase after treatment), damage on graded kernels, and yield in fields where fungicides were targeted to the effected area from soil borne diseases versus broadcast applications. Seventy-nine fields were observed to have disease of the 100 plus and were treated with either targeted or broadcast treatments. Targeted fungicide applications were applied using 40 to 50 pounds per square inch of air pressure in application equipment, 15 gallons of water per acre in the targeted zone, no surfactant to prevent “sticking of product to foliage”, and slow rates of speed to maximize penetration. Fields with canopies larger than one foot in height were not tested due to the inability of fungicide to effectively penetrate the canopy. Fields examined had *Rhizoctonia solani* and *Pythium species* present and causing damage in the fields. Fields were examined weekly during the months of July, August, September, and until digging of the crop. Data was recorded on the parameters described and analyzed using Statistix ™ 8.1.

Results:
No fields of the targeted treatment method had damage above 1.0% while one field of broadcast method had damage above 2.5% causing Segregation II peanuts and reduced price. Further, yield averages of targeted versus broadcast were not statistically, significantly different, nor was grade. See table below.

TABLE 1

Treatment	df	Yield	Grade	Kernel Damage
Targeted	37	4,966.2	76.5	a
Broadcast	40	4,367.0	74.2	a
Total	79	NS	NS	NS

* damaged kernels scored by grading with presence of > 2.49% or < 2.49%

Conclusions:
Control of peanut disease caused by *Rhizoctonia sol*ani and *Pythium species* were effective using targeted fungicide applications. The only area where applications were should be avoided is late season (late August, September) in vigorous canopies produced by Virginia and Valencia peanuts due to canopy height or canopy density which prevented applied product from penetrating the canopy. Finally, the fungicide costs reduced were proportional to the soil surface area percentage that was not treated with fungicide.

Peanut Management Systems

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Summary

Twenty three variety trials (12 – runner, 6 – Virginia, 3 – Spanish, 2 – Valencia) were conducted this past year to assess new and existing commercial cultivars. This included evaluation of runner (17), Virginia (13), Spanish (6), and Valencia (7) market-types. When averaged across at least 6 to 12 locations all runner varieties yielded greater than 4000 lb/A. Flavorrunner 458, ANorden, Tamrun OL02, Georgia 02C all yielded greater than 4300 lb/A. Within the West Texas trials Flavorrunner 458, ANorden, and Tamrun OL02 all yielded over 4700 lb/A. In Central Texas only Georgia 02C yielded over 3500 lb/A, while in South Texas Carver, AP-3, and GP-1 all yielded over 4500 lb/A. NC12C and VC2 averaged over 6 locations were the only Virginia varieties to yield over 5000 lb/A. However while NC12C averaged over 45% extra large kernels, VC2 averaged less than 30%. An experimental (NC9 HiO/L) yielded over 5500 lb/A at the one location where it was tested. Georgia 04S and Tamspan 90 averaged over 4500 lb/A (3 locations). Georgia 04S and AT9899-14 are small seeded runner peanut being marketed as Spanish peanut. There were no differences in peanut yield between any of the Valencia varieties (2 locations). In an evaluation of market-types (2 locations) Flavorrunner 458 out yielded all other varieties except Tamrun OL02 at both locations and NC12C at one location. Irrigation termination timing did not affect yield with Spanish peanut (Tamspan 90). Yields with runner peanut (Tamrun OL02) was reduced when the irrigation was terminated on September 1. In addition yields were lower with all runner termination timings when compared to termination timing 1 and Spanish peanut. Simulated hail damage only reduced peanut yield when peanut was 99% defoliated at the full bloom growth stage.

Peanut Management Systems

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Introduction

Growers are faced with numerous production issues each year. New varieties, herbicides, and other products must be continually evaluated to determine their contribution to overall profitability. The Extension Agronomy Peanut Team continues to try to address many of these issues and provide answers to grower's questions. In addition, educational efforts were conducted throughout the state at several events. Several new varieties were tested again this past year to determine their overall feasibility and adaptability in Texas. The results of many of the agronomic studies will be discussed in this report while the weed management projects are presented in a separate weed control report.

Discussion

Variety trials were conducted in Atascosa, Cochrane, Collingsworth, Comanche, Frio, Haskell, Hockley, Dawson (Ag-Cares Farm), Frio, Gaines, Hockley, Lamb, Terry, Wilbarger, and Yoakum Counties. Variety trials investigated (# of trials/# of varieties): runner (12/17), Virginia (6/13), Spanish (3/6), and Valencia (2/7) market-types. When averaged across at least 6 to 12 locations all runner varieties yielded greater than 4000 lb/A. Flavorrunner 458, ANorden, Tamrun OL02, Georgia 02C all yielded greater than 4300 lb/A. Within the West Texas trials Flavorrunner 458, ANorden, and Tamrun OL02 all yielded over 4700 lb/A. In Central Texas only Georgia 02C yielded over 3500 lb/A, while in South Texas Carver, AP-3, and GP-1 all yielded over 4500 lb/A. Averaged across locations WT03 0048 (2 locations), WT03 0051 (2), Flavorrunner 458 (9), Georgia 02C (11), AT9899-14 (1), Georgia 04S (5), Tamrun OL02 (12), and ANorden (12) all had grades greater than 75. NC12C and VC2 both yielded over 5000 lb/A (average 6 locations). Champs, VA98R, and Phillips all had grades of 74. Brantley, Gregory, Phillips, and NC12C all had over 45% extra large kernels. An experimental (NC9 HiO/L) was tested at 1 location and yielded over 5700 lb/A, graded 75, with 38% extra large kernels. Another experimental (N00098ol) was tested at 3 locations with an average yield over 4500 lb/A, graded 73, and averaged over 50% extra large kernels. Georgia 04S and Tamspan 90 averaged over 4500 lb/A (3 locations). Georgia 04S and AT9899-14 are small seeded runner peanut being marketed as Spanish peanut. AT9899-14 averaged less than 3700 lb/A. All Spanish varieties graded at least 75 except a private experimental and Spanco. There were no differences in peanut yield between any of the Valencia varieties (2 locations). An experimental line (NM 02565) was the only variety to yield over 4500 lb/A at either location. Grades were less than 70 with all of the Valencia varieties in 2005.

Trials were conducted at 2 locations to evaluate the performance of the various market-types (2-runner, 2-Virginia, 2-Spanish, and 2-Valencia) under similar growing conditions. At the AG-CARES farm, Flavorrunner 458, Tamrun OL02, and NC12C all yielded over 4000 lb/A. Flavorrunner 458 and Tamrun OL02 were the only varieties to grade over 75 at this location. Flavorrunner 458, Tamrun OL02, and NC12C all yielded over 6000 lb/A in a second study located near Sudan. Olin, Flavorrunner 458, and Tamspan 90 were the only varieties to grade over 75 at this location.

A study was conducted to compare sandwich digging to conventional digging on peanut yield and quality. Due to rainfall during harvest the first 2 replications were harvested on October 4 while the second 2 replications were harvested on October 21. No differences in yield, grade, harvest loss, or peanut value were observed. Sound splits was higher with the conventional digger (this was especially noticeable during the second harvest timing) while moisture was higher with the sandwich digger. None of the peanut flavor attributes were affected by digger method with the exception that skin slippage was higher with the sandwich digger. This is the second year that digging method did not affect yield or quality. However, extremely hot temperatures have not occurred after digging in either of the two years of this study.

A study was conducted to evaluate the effects of simulated hail on peanut yield and grade. Hail damage was simulated by defoliating peanut plants at levels of 33, 66, and 99% (with the use of a gas-powered weed trimmer equipped with a metal blade) at beginning and full bloom. The only treatment that reduced yield when compared to when no hail damage occurred was when peanut were 99% defoliated at the full bloom growth stage. Peanut grade was not affected by any defoliation level at either growth stage.

The final trial was conducted at AG-CARES to evaluate the effects of irrigation termination on Spanish (Tamspan 90) and Runner (Tamrun OL02) on peanut yield and quality. Termination timings were September 1, 15, and 22. Irrigation termination timing did not affect yield with Spanish peanut (Tamspan 90). Yields with runner peanut (Tamrun OL02) was reduced when the irrigation was terminated on September 1. In addition yields were lower with all runner termination timings when compared to termination timing 1 and Spanish peanut. Grades were 1 point lower with the termination timing 1 and Spanish peanut compared to termination timing 2 and 3, while termination timing 3 was 1 point lower with runner peanut compared to termination timing 1 and 2.

Acknowledgements

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Texas A&M Research & Extension

Runner Peanut Variety Trials

Project Code……………………..……: PGN05-01
Cooperator………...……….....…...: Ronnie Wallace
Location………………...……….... : Seminole, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/2-30" rows x 70'
Planting Date……………………… : 4/27/2005
Digging Date……………………….: 10/9/2005
Harvest Date……………………….: 10/26/2005
Days from Planting to Digging….. : 165

Project Code……………………..……: PGN05-03
Cooperator………...……….....…...: Darren Spradlin
Location………………...……….... : Seminole, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/2-30" rows x 70'
Planting Date……………………… : 4/27/2005
Digging Date……………………….: 10/20/2005
Harvest Date……………………….: 10/26/2005
Days from Planting to Digging….. : 176

Project Code……………………..……: PTY05-01
Cooperator………...……….....…...: Michael Franke
Location………………...……….... : Wellman, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/2-40" rows x 70'
Planting Date……………………… : 4/27/2005
Digging Date……………………….: 10/24/2005
Harvest Date……………………….: 11/2/2005
Days from Planting to Digging….. : 180

Project Code……………………..……: PACF05-01
Cooperator………...……….....…...: Ag-Cares Farm
Location………………...……….... : Lamesa, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/2-40" rows x 70'
Planting Date……………………… : 4/26/2005
Digging Date……………………….: 10/29/2005
Harvest Date……………………….: 11/7/2005
Days from Planting to Digging….. : 186

Project Code…………………………: PHO05-01
Cooperator………….…………..……..: Driscal Bryant
Location…………………..………… : Whitharral, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/2-40" rows x 70'
Planting Date……………………… : 4/28/2005
Digging Date…………………………: 10/18/2005
Harvest Date…………………………: 10/25/2005
Days from Planting to Digging….. : 173
Comments: There were no difference in yield between varieties at this location. GP-1 and Tamrun OL02 had grades lower than 75.

Project Code…………………………: PCO05-01
Cooperator………….…………..……..: Larry Beseda
Location…………………..………… : Whiteface, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 5/2-40" rows x 45'
Planting Date……………………… : 4/26/2005
Digging Date…………………………: 10/18/2005
Harvest Date…………………………: 10/26/2005
Days from Planting to Digging….. : 175

Project Code…………………………: PCW05-01
Cooperator………….…………..……..: Dan & Rex Henard
Location…………………..………… : Quail, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/2-40" rows x 50'
Planting Date……………………… : 5/9/2005
Digging Date…………………………: 10/6/2005
Harvest Date…………………………: 10/18/2005
Days from Planting to Digging….. : 150

Project Code…………………………: PWB05-01
Cooperator………….…………..……..: Clint White
Location…………………..………… : White City, TX
Experimental Design………………: Randomized Complete Block
Number of Reps/Plot Size………... : 4/2-40" rows x 70'
Planting Date……………………… : 5/10/2005
Digging Date…………………………: 10/1/2005
Harvest Date…………………………: 10/5/2005
Days from Planting to Digging….. : 144

Project Code……………………….: PHK05-01
Cooperator……………………….: Jimmy Burson
Location……………………….: Rochester, TX
Experimental Design……………….: Randomized Complete Block
Number of Reps/Plot Size………..: 4/2-40" rows x 70'
Planting Date……………………….: 5/2/2005
Digging Date……………………….: 9/29/2005
Harvest Date……………………….: 10/14/2005
Days from Planting to Digging…..: 150

Project Code……………………….: PCM05-01
Cooperator……………………….: George Bingham
Location……………………….: De Leon, TX
Experimental Design……………….: RCB
Number of Reps/Plot Size………..: 4/2-36" rows x 70'
Planting Date……………………….: 5/16/2005
Digging Date……………………….: 10/3/2005
Harvest Date……………………….: 10/15/2005
Days from Planting to Digging…..: 140

Project Code……………………….: PAT05-01
Cooperator……………………….: Floyd Royal
Location……………………….: Pleasanton, TX
Experimental Design……………….: RCB
Number of Reps/Plot Size………..: 4/2-38" rows x 85'
Planting Date……………………….: 6/15/2005
Digging Date……………………….: 10/25/2005
Harvest Date……………………….: 11/1/2005
Days from Planting to Digging…..: 132

Project Code……………………….: PFR05-01
Cooperator……………………….: Bennett Bros. Farms/James Overstreet
Location……………………….: Pearsall, TX
Experimental Design……………….: RCB
Number of Reps/Plot Size………..: 3/2-38" rows x 70'
Planting Date……………………….: 5/24/2005
Digging Date……………………….: 10/11/2005
Harvest Date……………………….: 10/20/2005
Days from Planting to Digging…..: 140

Texas A&M Research & Extension

Runner Peanut Variety Trials - 2005

Location: Seminole, TX Cooperator: Ronnie Wallace

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------------------------	----------------------------	(%)	----------------------------	----------------------------
Georgia 02C	5132	78	62	16	2	0
Tamrun OL02	4992	79	63	16	1	1
ANorden	4560	78	64	14	2	1
Georgia 04S	4404	77	59	18	3	1
GP-1	4377	77	61	16	2	0
Flavorrunner 458	4183	79	62	17	1	0
WT03 0048	3805	78	64	14	3	0
WT03 0051	3287	79	61	18	2	0
LSD (P=.10)	NS	NS	NS	NS	NS	NS
Standard Deviation	976	2	5	4	1	1
CV	22	3	8	24	41	138
Test Mean	4343	78	62	16	2	0

Location: Seminole, TX Cooperator: Darren Spradlin

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------------------------	----------------------------	(%)	----------------------------	----------------------------
Tamrun OL02	5136	79	64	15	1	0
Georgia 04S	5116	75	52	23	3	1
ANorden	5077	80	59	22	1	0
WT03 0048	4968	81	63	17	1	0
Georgia 02C	4960	80	62	18	1	0
WT03 0051	4864	80	65	15	1	0
GP-1	4739	78	59	19	2	1
Flavorrunner 458	4716	80	64	16	1	1
LSD (P=.10)	NS	2	6	NS	1	NS
Standard Deviation	439	1	4	4	0	0
CV	9	1	6	19	26	100
Test Mean	4947	79	61	18	1	0

Location: Wellman, TX Cooperator: Michael Franke

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------	----------	(%)	----------	----------
ANorden	5694	78	61	17	2	1
Flavorrunner 458	5124	79	69	11	2	1
GP-1	4779	77	62	15	3	0
Georgia 02C	4764	79	68	11	2	1
Tamrun OL02	4358	77	65	12	2	1
Georgia 04S	4134	78	59	19	2	0
LSD (P=.10)	NS	1	3	3	NS	NS
Standard Deviation	1131	1	2	2	1	1
CV	24	1	4	15	36	77
Test Mean	4809	78	64	14	2	1

Location: Lamesa, TX Cooperator: Ag-Cares Farm

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------	----------	(%)	----------	----------
ANorden	4630	74	54	21	2	1
Tamrun OL02	4207	77	63	15	1	0
Flavorrunner 458	3871	79	61	19	1	1
Georgia 02C	3009	79	57	22	1	0
Georgia 04S	2854	75	49	26	2	1
GP-1	2180	77	57	20	1	0
LSD (P=.10)	948	3	7	6	0	1
Standard Deviation	765	2	5	4	0	1
CV	22	2	9	19	24	91
Test Mean	3459	77	57	20	1	1

Location: Whitharral, TX Cooperator: Driscal Bryant

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------	----------	(%)	----------	----------
Georgia 04S	3940	75	59	16	3	1
GP-1	3881	73	63	10	4	1
Georgia 02C	3855	77	69	8	2	1
Flavorrunner 458	3833	75	64	11	3	1
Tamrun OL02	3309	74	63	10	4	0
ANorden	3251	77	65	12	2	1
LSD (P=.10)	NS	2	4	4	1	NS
Standard Deviation	717	1	3	2	1	0
CV	19	2	4	21	17	67
Test Mean	3678	75	64	11	3	1

Location: Whiteface, TX Cooperator: Larry Beseda

Variety	Yield	Grade	SMK	SS
	lb/A	------------- (%) -------------		
Flavorrunner 458	5360	80	77	3
Anorden	5182	79	74	5
GP-1	5140	74	69	5
Tamrun OL02	4904	77	71	6
AT 9899-14	3787	76	68	8
Andru II	3606	77	70	7
LSD (P=.10)	508	2		
CV	16	3		
Test Mean	4875	77		

Location: Quail, TX Cooperator: Dan & Rex Henard

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	---------------------------- (%) ----------------------------				
Georgia 02C	6098	77	65	12	2	0
ANorden	5939	75	61	14	3	1
Tamrun OL02	5861	76	65	11	1	1
Flavorrunner 458	5578	77	64	13	2	1
GP-1	5432	75	62	13	2	2
Andru II	5354	74	59	15	3	1
LSD (P=.10)	NS	NS	NS	NS	1	NS
Standard Deviation	444	1	3	3	1	1
CV	8	2	6	23	42	91
Test Mean	5710	76	63	13	2	1

Location: White City, TX Cooperator: Clint White

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	---------------------------- (%) ----------------------------				
Flavorrunner 458	5390	74	67	8	5	0
Tamrun OL02	5201	73	65	8	3	1
ANorden	4727	72	63	10	5	1
Andru II	4694	74	64	10	3	0
GP-1	4564	74	66	8	4	1
Georgia 02C	4304	75	66	9	4	1
LSD (P=.10)	603	2	NS	NS	NS	1
Standard Deviation	487	1	2	2	1	0
CV	10	2	3	20	19	48
Test Mean	4813	74	65	9	4	1

Location: Rochestor, TX Cooperator: Jimmy Burson

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------------------------	----------------------------	(%)	----------------------------	----------------------------
Andru II	3651	74	52	23	2	1
Tamrun OL02	3628	74	58	16	2	1
Georgia 02C	3472	76	59	18	2	1
ANorden	3339	76	53	23	2	1
Flavorrunner 458	3332	75	57	18	2	1
GP-1	2649	74	53	21	2	1
LSD (P=.10)	NS	NS	3	4	NS	NS
Standard Deviation	501	2	2	3	1	1
CV	15	2	4	14	33	54
Test Mean	3345	75	55	20	2	1

Location: DeLeon, TX Cooperator: George Bingham

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------------------------	----------------------------	(%)	----------------------------	----------------------------
Georgia 02C	3841	79	60	20	3	1
Carver	3316	74	56	18	6	2
Tamrun 96	3263	77	54	24	4	1
ANorden	3122	78	55	24	4	1
AP-3	2813	75	62	14	3	1
GP-1	2741	74	53	21	5	2
Andru II	2663	76	52	24	3	1
Tamrun OL02	2628	77	55	22	4	1
LSD (P=.10)	634	2	4	4	1	NS
Standard Deviation	521	2	4	4	1	1
CV	17	2	6	17	26	96
Test Mean	3048	76	56	21	4	1

Location: Pleasanton, TX Cooperator: Floyd Royal

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------------------------		(%)	----------------------------	
GP-1	4059	73	62	11	5	1
Carver	4046	72	68	4	4	1
AP-3	3925	72	68	5	3	1
Andru II	3920	70	58	13	6	1
Hull	3880	72	67	5	3	2
Tamrun 96	3874	70	61	8	5	1
Georgia Green	3801	68	59	9	7	3
ANorden	3706	71	57	14	5	1
Georgia 02C	3633	71	65	6	5	1
Tamrun OL01	3619	71	67	4	4	1
Tamrun OL02	3605	69	65	5	5	1
DP-1	2733	64	62	2	8	1
LSD (P=.05)	244	3	3	1	1	1
Standard Deviation	203	2	3	1	1	1
CV	5	3	4	16	24	63
Test Mean	3733	70	63	7	5	1

Location: Pearsall, TX Cooperator: Bennett Bros./James Overstreet

Variety	Yield	Grade	SMK	SS	OK	DK
	lb/A	----------------------------		(%)	----------------------------	
Carver	5325	76	72	4	4	0
AP-3	5191	75	69	5	2	0
Tamrun OL01	5155	75	69	5	3	0
GP-1	5040	75	65	10	6	0
Hull	5040	73	66	7	4	0
Georgia 02C	5017	77	69	8	3	0
Tamrun 96	4997	73	65	8	5	0
Andru II	4784	73	58	15	5	0
Tamrun OL02	4751	75	68	7	5	0
Georgia Green	4666	75	67	8	5	0
ANorden	4643	71	59	12	7	1
DP-1	4188	73	70	3	4	0
LSD (P=.05)	394	3	3	3	2	NS
Standard Deviation	281	2	2	2	1	0
CV	6	2	4	28	29	303
Test Mean	4900	74	66	8	4	0

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, OK = other kernel, DK = damaged kernel,
Means within a column which differ by more than the LSD are statistically different (P=0.10).

Texas A&M Research & Extension

Virginia Peanut Variety Trials

Project Code…………………..……: PGN05-01
Cooperator………….....……….........: Ronnie Wallace
Location…………………..………….: Seminole, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………...: 4/2-30" rows x 70'
Planting Date……………………….: 4/27/2005
Digging Date…………………..……: 10/9/2005
Harvest Date…………………..……: 10/26/2005
Days from Planting to Digging…..: 165

Project Code…………………..……: PGN05-03
Cooperator………….....……….........: Darren Spradlin
Location…………………..………….: Seminole, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………...: 4/2-30" rows x 70'
Planting Date……………………….: 4/27/2005
Digging Date…………………..……: 10/20/2005
Harvest Date…………………..……: 10/26/2005
Days from Planting to Digging…..: 176

Project Code…………………..……: PTY05-02
Cooperator………….....……….........: Glen Martin
Location…………………..………….: Brownfield, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………...: 4/2-40" rows x 70'
Planting Date……………………….: 4/27/2005
Digging Date…………………..……: 10/18/2005
Harvest Date…………………..……: 10/25/2005
Days from Planting to Digging…..: 174

Cooperator………….....……….........: Ag-Cares Farm
Location…………………..………….: Lamesa, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………...: 4/2-40" rows x 70'
Planting Date……………………….: 4/26/2005
Digging Date…………………..……: 9/22/2005
Harvest Date…………………..……: 9/27/2005
Days from Planting to Digging…..: 149

Project Code…………………..……: PTY05-04

Cooperator……………..……….……..: Ty Wilmeth
Location…………………..…………. : Tokio, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 6/2-40" rows x 40'
Planting Date……………………… : 5/6/05
Digging Date…………………….…: 10/4/05
Harvest Date……………………….: 10/26/05
Days from Planting to Digging….. : 151

Project Code……………………….: PWB05-02
Cooperator……………..……….……..: Clint White
Location…………………..…………. : White City, TX
Experimental Design………………: Randomized Complete Block
Number of Reps/Plot Size………... : 4/2-40" rows x 70'
Planting Date……………………… : 5/10/2005
Digging Date…………………….…: 10/1/2005
Harvest Date……………………….: 10/5/2005
Days from Planting to Digging….. : 144

Texas A&M Research & Extension

Virginia Peanut Variety Trials - 2005

Location: Seminole, TX   Cooperator: Ronnie Wallace

Variety	Yield	Grade	SMK	SS	ELK	OK	DK
Champs	6177	74	67	7	49	1	0
NC12C	5894	74	67	7	54	1	0
NC9 HiO/L	5743	75	63	12	38	2	0
Phillips	5519	74	65	9	51	1	0
VC2	5485	72	65	8	27	3	0
VA98R	5430	74	66	8	50	1	0
Wilson	5284	70	64	7	37	3	0
Brantly	5229	74	66	7	52	1	0
NC7	5090	70	61	9	29	3	0
Gregory	5057	73	68	6	56	2	0
Jupiter	4840	72	65	8	42	2	0
N00098ol	4605	73	66	7	51	2	0
LSD (P=.10)	769	2	NS	3	6	1	NS
Standard Deviation	641	2	3	2	4	1	0
CV	12	2	4	23	9	34	600
Test Mean	5363	73	65	8	45	2	0

Location: Seminole, TX   Cooperator: Darren Spradlin

Variety	Yield	Grade	SMK	SS	ELK	OK	DK
VA98R	5567	75	64	12	49	1	0
Gregory	5479	75	69	7	62	1	0
NC7	5376	75	66	9	43	1	0
Wilson	5277	74	66	8	47	1	0
VC2	5143	75	67	8	37	2	0
NC12C	5088	74	65	10	55	1	0
Phillips	5083	77	70	7	60	1	0
Brantly	4936	75	67	8	62	1	0
Champs	4779	76	68	8	53	1	0
Jupiter	3848	75	68	7	50	1	0
LSD (P=.10)	740	NS	3	2	5	0	NS
Standard Deviation	614	1	2	2	3	0	0
CV	12	2	3	21	7	16	398
Test Mean	5058	75	67	8	52	1	0

Location: Brownfield, TX   Cooperator: Glen Martin

Variety	Yield	Grade	SMK	SS	ELK	OK	DK
	lb/A		----------------------------	(%)	----------------------------		
VC2	5692	74	69	5	18	1	0
VA98R	5660	75	67	8	36	1	0
Wilson	5640	72	65	7	31	2	0
Gregory	5595	75	69	6	55	1	0
NC12C	5539	76	69	7	50	1	0
Champs	5273	75	70	6	40	1	0
Georgia 03L	5266	73	63	10	32	1	0
Jupiter	5123	73	70	4	38	1	0
NC7	5100	72	66	6	20	2	0
Phillips	4821	74	67	8	55	1	0
N00098ol	4473	72	64	9	49	1	0
Brantly	4164	74	70	4	55	1	0
LSD (P=.10)	476	1	3	3	7	1	NS
Standard Deviation	397	1	2	2	5	1	0
CV	8	1	3	26	12	32	0
Test Mean	5196	74	67	7	40	1	0

Location: Lamesa, TX   Cooperator: Ag-Cares Farm

Variety	Yield	Grade	SMK	SS	ELK	OK	DK
	lb/A		----------------------------	(%)	----------------------------		
Wilson	4156	68	62	7	33	1	0
VC2	4040	69	65	4	20	2	0
Jupiter	4017	71	66	5	40	1	0
VA98R	3924	71	63	8	35	1	0
Gregory	3831	67	62	5	44	2	0
NC12C	3831	69	64	5	32	2	0
NC7	3599	68	62	7	25	2	0
Champs	3599	72	64	8	35	1	0
Brantly	3460	71	64	7	47	1	0
Phillips	3367	70	64	6	44	2	0
Georgia 03L	2949	69	62	7	23	2	0
LSD (P=.10)	NS	2	NS	2	15	NS	NS
Std Dev	688	1	2	2	11	1	0
CV	19	2	3	27	31	38	0
Test Mean	3707	70	63	6	34	2	0

Location: Tokio, TX Cooperator: Ty Wilmeth

Variety	Yield	Grade	ELK
	lb/A	-------- (%)	---------
VC2	5149	73	25
NC12C	5063	74	37
Gregory	4816	74	45
Brantley	4541	74	47
Champs	4500	73	39
Phillips	4462	74	44
NC7	4440	73	19
Georgia 03L	4356	73	25
Jupiter	4247	73	33
VA98R	3903	73	34
Wilson	3632	71	31
LSD (P=.10)	423	1	5
CV	2	28	14
Test Mean	4464	73	34

Location: White City, TX Cooperator: Clint White

Variety	Yield	Grade	SMK	SS	ELK	OK	DK
	lb/A		----------------------------	---------------------------- (%)	----------------------------		
Phillips	5006	73	68	6	55	2	0
NC12C	4974	74	68	6	52	2	0
VC2	4876	72	68	4	36	3	0
Gregory	4779	71	67	5	51	2	0
Brantly	4551	72	68	5	55	2	0
N00098ol	4519	73	68	6	56	2	0
VA98R	4454	75	67	8	52	1	0
Wilson	4389	71	66	5	42	2	0
Georgia 03L	4258	73	67	6	31	2	0
Jupiter	4193	74	70	4	53	1	0
Champs	3998	74	70	5	45	2	0
NC7	3940	71	68	3	44	2	0
LSD (P=.10)	635	2	NS	2	10	NS	NS
Standard Deviation	529	1	2	1	7	1	0
CV	12	2	3	28	16	34	0
Test Mean	4495	73	68	5	48	2	0

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, OK = other kernel, DK = damaged kernel,
Means within a column which differ by more than the LSD are statistically different (P=0.10).

Texas A&M Research & Extension

Spanish Peanut Variety Trials

Project Code…………………….……: PTY05-05
Cooperator………….…..……….…..….....: Buster Adair
Location……………………..………… : Wellman, TX
Experimental Design……………….: RCB
Number of Reps/Plot Size………... : 6/4-40" rows x 48'
Planting Date………………………. : 5/19/2005
Digging Date……………………….…: 10/27/2005
Harvest Date……………………….…: 11/4/2005
Days from Planting to Digging….. : 161

Project Code…………………….……: PHO05-02
Cooperator………….…..……….…..….....: Jason Bailey
Location……………………..………… : Whiteface, TX
Experimental Design……………….: RCB
Number of Reps/Plot Size………... : 6/4-40" rows x 48'
Planting Date………………………. : 5/13/2005
Digging Date……………………….…: 10/15/2005
Harvest Date……………………….…: 11/1/2005
Days from Planting to Digging….. : 155

Project Code…………………….……: PLB05-04
Cooperator………….…..……….…..….....: Brian Patterson
Location……………………..………… : Littlefield, TX
Experimental Design……………….: RCB
Number of Reps/Plot Size………... : 5/4-30" rows x 40'
Planting Date………………………. : 5/12/2005
Digging Date……………………….…: 10/16/2005
Harvest Date……………………….…: 11/2/2005
Days from Planting to Digging….. : 157

Texas A&M Research & Extension

Valencia Peanut Variety Trials

Project Code……………………..……: PYK05-01
Cooperator…………...………...…....: Jet Wilmeth
Location………………...…………. : Tokio, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 4/4-40" rows x 35'
Planting Date……………………… : 5/5/2005
Digging Date…………………..……: 9/15/2005
Harvest Date……………………..…: 9/20/2005
Days from Planting to Digging….. : 133

Project Code……………………..……: PLB05-05
Cooperator…………...………...…....: Brad Heffington
Location………………...…………. : Littlefield, TX
Experimental Design………………: RCB
Number of Reps/Plot Size………... : 5/4-30" rows x 40'
Planting Date……………………… : 5/12/2006
Digging Date…………………..……: 9/21/2006
Harvest Date……………………..…: 9/27/2006
Days from Planting to Digging….. : 132

Texas A&M Research & Extension

Spanish Peanut Variety Trials - 2005

Location: Wellman, TX Cooperator: Buster Adair

Variety	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
Georgia GA 04S	5182	77	72	4
Tamspan 90	4711	77	71	3
OLin	4356	77	74	6
Private Exptl.	4175	75	75	7
Spanco	4169	75	73	5
AT 9899-14	4029	76	74	6
LSD (P=.10)	348	1		
CV	12	2		
Test Mean	4437	76	73	5

Location: Whiteface, TX Cooperator: Jason Bailey

Variety	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
Georgia GA 04S	4722	77	72	5
Tamspan 90	4594	74	70	4
Private Exptl.	4401	73	70	4
OLin	4360	78	73	5
Spanco	3321	71	67	4
AT 9899-14	3259	76	70	6
LSD (P=.10)	347	1		
CV	17	3		
Test Mean	4110	75	70	5

Location: Littlefield, TX Cooperator: Brian Patterson

Variety	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
Private Exptl.	4719	74	67	7
Tamspan 90	4540	74	68	6
Spanco	4388	74	67	6
OLin	4037	76	68	8
Georgia GA 04S	4031	73	65	8
AT 9899-14	3809	75	67	7
LSD (P=.10)	442	NS		
CV	12	2		
Test Mean	4254	74	67	7

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Valencia Peanut Variety Trials - 2005

Location: Tokio, TX Cooperator: Jet Wilmeth

Variety	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
NM 02565	4803	68	58	11
Gentex 136	4692	64	61	3
NM 02322	4473	67	59	8
Gentex 101	4197	63	62	1
Valencia C	4184	60	59	1
Valencia A	4106	62	61	1
Gentex 102	4094	63	62	1
LSD (P=.10)	NS	2		
CV	13	5		
Test Mean	4128	62	61	1

Location: Littlefield, TX Cooperator: Brad Heffington

Variety	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
Valencia A	3367	66	58	7
Valencia C	3295	68	63	5
Gentex 136	3270	68	62	6
Gentex 101	3122	69	63	6
Gentex 102	3112	67	60	7
LSD (P=.10)	NS	1		
CV	18	2		
Test Mean	3112	67	60	7

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, OK = other kernel, DK = damaged kernel,
Means within a column which differ by more than the LSD are statistically different (P=0.10).

Texas A&M Research & Extension

Market Type Trials - 2005

Project Code……………………..……:	PACF05-03
Cooperator…………...……….......…..:	AG-CARES
Location………………...………….. :	Lamesa, TX
Experimental Design………………:	RCB
Number of Reps/Plot Size………... :	4/4-40" rows x 50'
Planting Date………………………. :	4/26/2005
Digging Date…………………..……:	Spanish - 9/13/05
	Virginia - 9/22/05
	Runner - 10/29/05
Harvest Date…………………..…… :	Spanish - 9/22/05
	Virginia - 9/27/05
	Runner - 11/7/05
Days from Planting to Digging….. :	Spanish - 140
	Virginia - 149
	Runner - 186

Project Code……………………..……:	PLB05-01
Cooperator…………...……….......…..:	Haldon Messamore
Location………………...………….. :	Sudan, TX
Experimental Design………………:	RCB
Number of Reps/Plot Size………... :	4/4-40" rows x 50'
Planting Date………………………. :	5/11/2005
Digging Date…………………..……:	10/13/2005
Harvest Date…………………..…… :	10/20/2005
Days from Planting to Digging….. :	155

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Market Type Trials - 2005

Location: Lamesa, TX Cooperator: AG-CARES

Market-Type	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
Flavorrunner 458	4397	79	59	20
Tamrun OL02	4066	77	58	19
NC 12C	4045	71	64	7
NC 7	3554	69	62	7
Tamspan 90	3193	73	61	12
Valencia C	3177	71	61	10
Genetex 136	3177	71	63	9
OLin	2571	73	60	14
LSD (P=.10)	551	1	2	3
Standard Deviation	453	1	2	2
CV	13	1	3	17
Test Mean	3523	73	61	12

Location: Sudan, TX Cooperator: Haldon Messamore

Market-Type	Yield	Grade	SMK	SS
	lb/A	----------------------------	(%)	----------------------------
Flavorrunner 458	6616	76	68	9
Tamrun OL02	6269	74	66	9
NC 12C	6020	72	68	4
OLin	5878	78	68	10
NC 7	5570	70	66	5
Tamspan 90	5531	76	67	10
Valencia C	4572	75	70	5
Genetex 136	4550	75	70	5
LSD (P=.10)	500	2	3	2
Standard Deviation	348	1	2	2
CV	6	2	3	24
Test Mean	5626	74	68	7

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, OK = other kernel, DK = damaged kernel,
Means within a column which differ by more than the LSD are statistically different (P=0.10).

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Evaluation of Digger Method on Peanut Yields

Project Code………… : PGN05-05
Cooperator…………... : Gary Jackson
Location………………. : Seminole, TX
Exp. Design/# Reps…. : RCB/4
Plot Size………………. : 6-36" rows x ≈2420'
Planting Date…………: NA (Variety = Tamrun OL02)
Digging Date…………. : 9/28/2005
Harvest Date…………: 10/04/05 & 10/21/05

Location: Lockett, TX Cooperator: Devin Kieschnick

Treatment	Yield	Grade	SMK	SS	LSK	OK	DK	For Mat	Moist
	lb/A	-----	-----	-----	(%)	-----	-----	-----	-----
Conventional Digger	6908	77	66	10	2	1	0	6.5	8
Sandwich Digger	6720	76	73	3	3	2	0	6.3	12
LSD (P=.10)	NS	NS	NS	8	NS	NS	NS	NS	2
Standard Deviation	500	1	5	5	2	0	0	1.1	1
CV	7	2	7	73	78	26	0	33	10

Treatment	Value			Harvest Loss In	Harvest Loss Out	Harvest Loss Total	Atox
	¢/lb	$/Ton	$/A	-----	(lb/A)	-----	ppb
Conventional Digger	0	359	1238	220	123	342	0.0
Sandwich Digger	0	353	1187	354	183	537	0.0
LSD (P=.10)	NS	NS	NS	NS	NS	NS	NS
Standard Deviation	0	7	106	115	81	135	0
CV	2	2	9	40	53	31	0

Treatment	RPF	OFI	SkS	UBW	UBS	RNW	RNS	BW	BS
			-----	-----	-----	(%)	-----	-----	-----
Conventional Digger	5.3	0.0	69.5	0.9	0.0	2.7	1.6	83.4	11.2
Sandwich Digger	5.3	1.0	46.0	1.4	0.0	2.8	0.1	89.4	6.5
LSD (P=.10)	NS	NS	9.2	NS	NS	NS	NS	NS	NS
Standard Deviation	0.1	0.5	2	0.6	0	0.8	1.1	2	2
CV	3	217	7	109	0	55	270	5	45

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, LSK = loose shelled kernel, OK = other kernel,
DK = damaged kernel, For Mat = foreign material, Moist = Moisture, Atox = aflatoxin
Harvest Loss: In = Inside Windrow, Out = Outside Windrow, Total = Inside + Outside
RPF = roasted peanut flavor, OFI = off-flavor intensity, SkS = Skin Slippage, UBW = unblanched wholes
UBS = unblanched splits, RNW = rednose wholes, RNW = rednose splits, BW = blanched wholes
BS = blanched splits
Means within a column which differ by more than the LSD are statistically different (P=0.10).

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Evaluation of Simulated Hail Damage on Peanut Yields

Project Code……………………..……. : PWB05-05
Cooperator…………..………..…… : Devin Kieschnick
Location………………..…………. : Lockett, TX
Experimental Design……………… : RCB
Number of Reps/Plot Size………. : 4/4-40" rows x 50'
Planting Date……………………..… : 4/30/2005
Hail Damage Date…………………. : Early Bloom - 6/21/05
Full Bloom - 7/21/05
Harvest Date……………………..… : 10/24/2005

Location: Lockett, TX   Cooperator: Devin Kieschnick

Treatment	Yield	Grade	SMK	SS
	lb/A	----------------------	(%)	----------------------
Beginning Bloom - 33%	4775	75	63	13
Beginning Bloom - 66%	4217	75	63	12
Beginning Bloom - 99%	4151	77	64	12
Full Bloom - 33%	4222	76	64	13
Full Bloom - 66%	4261	77	65	13
Full Bloom - 99%	2917	77	62	15
No Hail Damage	4948	75	66	10
LSD (P=.10)	930	NS	NS	NS
Standard Deviation	759	2	3	3
CV	18	2	5	21
Test Mean	4213	76	64	13

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, OK = other kernel, DK = damaged kernel,
Means within a column which differ by more than the LSD are statistically different (P=0.10).

Texas A&M Research & Extension

Irrigation Termination Trial - 2005

Project Code…………………..……. : PACF05-04
Cooperator…………..………..…... : AG-CARES
Location……………………..………. : Lamesa, TX
Experimental Design……………… : RCB
Number of Reps/Plot Size……….. : 4/4-40" rows x 300'
Planting Date……………………..… : 4/26/2005
Irrigation Termination Date……… : Termination 1 = 9/1/05
Termination 2 = 9/15/05
Termination 3 = 9/22/05
Digging Date…………………..…… : Spanish T1, T2, T3 - 9/13/05, 9/22/05, 9/27/05
Runner T1, T2, T3 - 10/29/05
Harvest Date…………………..…… : Spanish T1, T2, T3 - 9/22/05, 9/27/05, 10/5/05
Runner T1, T2, T3 - 11/7/05
Days from Planting to Digging…. : Spanish T1, T2, T3 - 140, 149, 154
Runner T1, T2, T3 - 186

Location: Lamesa, TX   Cooperator: AG-CARES

Treatment	Yield	Grade	SMK	SS
	lb/A	----------------------	(%)	----------------------
Runner - Termination Timing 1	2241	77	66	11
Spanish - Termination Timing 1	4103	73	61	12
Runner - Termination Timing 2	2939	77	65	13
Spanish - Termination Timing 2	3701	74	58	17
Runner - Termination Timing 3	3343	76	65	12
Spanish - Termination Timing 3	3911	74	65	9
LSD (P=.10)	717	1	3	3
Standard Deviation	452	0	2	2
CV	13	1	3	16
Test Mean	3373	75	63	12

LSD = least significant difference, CV = coefficient of variation, NS = not significant
SMK = sound mature kernel, SS = sound splits, OK = other kernel, DK = damaged kernel,
Means within a column which differ by more than the LSD are statistically different (P=0.10).

West Texas Peanut Nutrition with *Rhizobium* and Nitrogen
Submitted by Calvin Trostle, Texas A&M—Lubbock, 806.746.6101, ctrostle@ag.tamu.edu

The following trials sites and activities were undertaken as part of the 2005 TPPB funding agreement.

Commercial *Rhizobium* Inoculant Evaluations—South Plains

Gaines Co. Planted April 28. Twenty eight different *Rhizobium* inoculant treatments were established on runner peanut. In addition to testing of commercial inoculants the following tests are also being conducted within the trial: planting depth, inoculant rate, N rate, calcium application. Also, five experimental inoculants were tested for nodulation and yield. This site was highlighted during the Gaines Co. peanut tour on July 21.

Results (Table 1): No yield differences were observed in 2005 among any treatments or even the controls. This is attributed to high residual fertility in the field. Differences among nodule counts were minimal for most products. Without inoculant, however, less than one nodule per plant was measured in June vs. 3-9 nodules per plant for most inoculant products. A 1" planting depth reduced nodulation for liquid inoculants. No effect in nodulation was observed due to the use of Helena's 'First Up' or in-furrow humic acid.

Terry Co. Planted May 9. This trial site on Valencia peanuts is essentially identical for inoculant treatments to the Gaines Co. site above. Again, high residual fertility (but no in-season N was applied over the peanuts as was the case on the rest of the field), apparently affected results.

Results (Table 2): No yellow color was observed even among uninoculated controls. Similar to the Gaines trial few differences were observed among nodulation (slightly higher among Nitragin products vs. other products, however) and no differences among yields. Background *Rhizobium* nodulation was higher in this trial than in Gaines Co. with control nodulation (no inoculant) about the same as some inoculants.

Table 1. Gaines Co. *Rhizobium* Trial, 2005.

Planted 2” deep unless noted otherwise **Inoculant Treatment**	Inoc. Rate	Mid-Season N Rate (lbs. N/A)	8-Jun Nodules per plant	Yield (lbs./A)
Untreated check (UTC)	0X	0	0.4	3978
UTC--1" deep (shallow)	0X	0	0.1	3764
UTC + First-Up	0X	0	0.6	3824
Nitragin Soil Implant granular	1X	0	5.3	4135
Nitragin Soil Implant granular	2X	0	5.9	4478
INTX N-Row granular	1X	0	3.0	3800
BU RhizoFlo granular	1X	0	1.1	4337
UAP DynaStart granular	1X	0	1.2	4122
Nitragin Optimize Lift liquid	1X	0	7.3	3720
Nitragin Optimize Lift, double rate	2X	0	8.5	XXXX
Optimize Lift + FirstUp	1X	0	9.3	3718
Optimize Lift + Hydra-Hume	1X	0	3.7	3817
Optimize Lift + 80 lbs. mid-season N/A	1X	80	6.9	4001
Optimize Lift + 720 lbs./A gypsum	1X	0	3.4	3914
INTX N-Take liquid	1X	0	3.0	4034
INTX N-Take exptl. liquid (Azospirillum)	1X	0	4.8	3875
BU HiStick L + Subtilex	1X	0	7.7	3923
BU HiStick L + Subtilex, 1" deep	1X	0	1.7	3654
BU Vault	1X	0	5.7	3741
BU HiStick L + Subtilex + First-Up	1X	0	3.0	3991
UAP DynaStart liquid	1X	0	5.3	3913
Nitragin Optimize Lift (Elam's)	1X	0	2.5	XXXX
BU = Becker Underwood				
UAP = United Agri Products			Average	3932
First-Up, Hydra-Hume, Helena Chemical			P-Value *(Rhiz)*	0.6432
			P-Value (Block)	<0.0001
			PLSD (0.10), *Bradyrhizobium*	NS
			PLSD (0.10) Block	194
			CV (%)	11.7

Table 2. Terry Co. *Rhizobium* Trial, 2005.

Planted at 2” depth unless noted otherwise **Inoculant treatment**	Inoculant rate	14-Jun Nodules/ plant	Yield (lbs./A)
Untreated check (UTC)	0X	11.2	4,205
UTC--1" deep (shallow)	0X	6.9	4,223
UTC + First-Up	0X	7.2	4,337
INTX N-Dure seedbox powder (seed wetted)	3.3X	10.0	4,294
Nitragin Soil Implant granular	1X	15.1	4,199
Nitragin Soil Implant granular	2X	15.4	4,169
Nitragin Soil Implant gran., 1" deep	1X	11.3	4,562
INTX N-Row granular	1X	12.0	3,921
BU RhizoFlo granular	1X	10.5	4,344
UAP DynaStart granular	1X	11.2	4,530
Nitragin Optimize Lift liquid	1X	18.3	4,328
Optimize Lift, double rate	2X	15.1	4,166
Optimize Lift + 80 lbs. mid-season N/A	1X	18.1	4,098
Optimize Lift + FirstUp	1X	15.6	4,253
Optimize Lift, powder in-furrow humate (Agro)	1X	14.1	4,458
Optimize Lift + Hydra-Hume	1X	13.0	4,250
INTX N-Take liquid	1X	13.3	4,309
INTX N-Take exptl. liquid (Azospirillum)	1X	10.5	4,281
BU HiStick L + Subtilex	1X	14.2	4,387
BU HiStick L + Subtilex, 1" deep	1X	10.5	4,332
BU HSL + Subtilex + First-Up	1X	15.2	4,276
BU Vault	1X	13.4	4,203
UAP DynaStart liquid	1X	11.6	4,093

CV (%)	4,276
P-Value (Rhiz)	0.4925
P-Value (Block)	0.0031
PLSD (Rhiz)	NS
PLSD (Block)	132
CV (%)	7.3

Commercial *Rhizobium* Inoculant Demonstrations—Southeast Panhandle

Working with producers and county agents two field demonstrations of *Rhizobium* inoculant vs. no inoculant were established in Donley and Motley Counties. Final nodulation counts in Donley Co. determined 155 nodules per plant without Nitragin Optimize Lift, but 196 nodules per plant with inoculant.

In Motley Co. (Billy Neal Shannon), liquid Optimize Lift was applied to two rows using experimental apparatus on the producer's planter. September nodule count demonstrated that the use of inoculant had a positive effect on nodulation and that planting depth may have as well. No inoculant: 16 nodules per plant; Lift @ 1.5" depth, 36 nodules per plant; Lift at 2.5" depth, 48 nodules per plant. This ground had never received inoculant before. This degree of nodulation vs. the uninoculated control suggests that yield response is possible, even probable if minimal nitrogen fertilizer is applied.

Field *Rhizobium* Nodulation Surveys

Surveys of field nodulation in the Moore/Sherman Cos., southeast Panhandle, Haskell Co., and Comanche/Erath Cos. were conducted. Follow-up with producers is not yet complete (determine inoculant product, if any, was used; how many years since peanuts, etc.).

Moore/Sherman Co.—Four fields, all first time peanuts, all receiving liquid inoculant, averaged a modest 26 nodules per plant. Future peanut production needs to achieve better nodulation.

Southeast Panhandle—Nodulation ranged from 20 nodules per plant (dryland field) to 197. Only one of nine fields was confirmed to have used liquid inoculant, and nodulation was over 125 per plant, but most fields were less. Two fields with lower than average nodulation used seedbox powder, and inferior product for *Rhizobium* inoculation.

Haskell Co.—Two of five fields using liquid inoculant achieved nodulation of 135 (Bevil) and 208 (Short) nodules per plant. Other fields were 89 to 135 nodules per plant. Overall nodulation was much less than the ~400 nodules per plant found in 2004. Producers in the area are interested in tests to validate the potential of inoculating crops, especially as most nodules on the lateral roots of the plants in the fields treated with liquid inoculant were inactive, whereas the majority of nodules on the taproot were.

Comanche/Erath Co.—Like Haskell Co., nodulation was greatly reduced (average 130 nodules per plant) vs. 2004 (over 225). No fields reported inoculant use, but most fields had many nodules that were never active. The range of nodulation was from 44 to 256 per plant. Little producer interest in these counties to try inoculant.

Special Problems Observed in 2005 Inoculated Peanut Fields

Lack of soil coverage due to either planter speeds over 6 mph or failing to drag enough dirt to cover the seed is limiting nodulation, and some producers don't realize this. For example, at one of the Spanish variety trial sites, I noticed large sections row the producer planted having as little as 0.25" of soil over the peanut seed, whereas other sections were much better covered. Nodulation counts in July showed that nodulation in the poorly covered sections of row was little more than half of that where peanut seed was properly covered for this field using granular inoculant.

Peanut Breeding
March 15, 2006
NPB Final Report

Title: **Breeding for Early-Maturing Peanuts**
Personnel: Mark D. Burow[1], Charles E. Simpson[2], Michael R. Baring[3], Jamie Ayers[4], and Yolanda López[4]
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1. Field evaluation of breeding lines. Field evaluation was an important part of this effort in 2005. Crosses evaluated included advanced runner and bunch lines ($F_{2:7}$ generation), F_4 Spanish breeding lines, and an advanced cross between Spanish and Valencia lines. In all these experiments, we have identified breeding lines that are much improved and approaching what we need for release as varieties.

$F_{2:7}$ Runner and Bunch Evaluation. We have identified several breeding lines with good combinations of yield, maturity, shelling, and seed size. We still need to work on pod appearance and purifying this material for the high-oleic trait. Disease data are presented in the TPPB report.

This experiment was grown at 5 locations in Texas. These populations are segregating for high oleic/linoleic content. Among these were three locations in West Texas (data from two are available currently), one in Central Texas, and one in South Texas. The locations outside West Texas (Stephenville, Pearsall) are allowing us to test these lines for resistance to Sclerotinia and tomato spotted wilt. The best lines from the 2004 runner (30 entries) and the 2004 bunch (20 entries) tests were chosen and combined into one experiment of 30 entries (including checks). The exception was the Stephenville sclerotinia test, where separate runner and bunch experiments were grown in 2005, because there were not enough seeds to plant most lines there in 2004.

At Brownfield (the J. Leek farm, Terry County), five entries (16, 6, 13, 17, and 14) were statistically equal to or greater than the checks (Florunner, TamrunOL02) for value per acre, although entry 16 out-yielded the other entries by at least 800 lb/acre (Table 1). The five entries were more mature than the checks, with maturity measured as the percentage of black and brown hulls by the hull scrape test. With the exception of entry 6, these lines had 41 to 52% mature pods, which was much higher than the 10% and 16% of TamrunOL02 and Florunner. The test was planted on May 10, and harvested on October 27, for 170 days in the field after planting. The maturity on the test overall was less than we expected, but the relative ranking of entries is what is most important. Three of the five entries has seed size similar to Florunner, but numbers 13 and 17 had seeds that were larger. Entries 16, 13, and 14 had shelling percentages lower than Florunner, but only entry 14 differed from TamrunOL02.

There were two entries (7 and 8) that had 74% and 85% mature pods, but these either yielded about 1000 pounds per acre less than the other entries or had small seed size. By backcrossing these to higher-yielding varieties, we may be able to improve the yield of these two lines.

Table 1. F27 Runner/Bunch - J.Leek Research Farm - Brownfield, Terry Co. - 2005

Entry	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK		PctELK	
16	1266	a	7191	a	43.9	d-h	66.6	ij	73.0	b-g	27.5	d-f
NC7	1246	ab	6375	b	48.4	d-g	101.0	a	74.9	a-c	55.4	a
06	1175	a-c	6285	bc	30.9	g-l	68.6	h-j	76.1	ab	47.6	b
Spanco	1123	a-d	6145	b-d	74.3	ab	56.1	lm	75.3	a-c	12.6	kl
Florunner	1112	a-d	5879	b-f	16.0	k-m	70.6	g-i	77.9	a	31.3	d
13	1065	b-e	6311	b-h	41.3	d-i	76.5	ef	71.1	d-i	31.5	d
TROL02	1056	c-e	6113	b-e	10.5	m	70.9	g-i	73.6	b-f	24.1	e-g
17	1042	c-e	5783	b-g	52.0	c-f	82.5	b-d	74.5	a-d	38.7	c
14	1020	c-f	6292	bc	45.3	d-g	71.9	e-g	68.9	h-j	28.5	de
21	987	d-g	5823	b-g	33.3	g-k	74.3	e-g	70.4	e-j	21.9	gh
12	980	d-g	5426	e-i	20.7	j-m	83.2	bc	74.2	a-d	28.2	de
15	970	d-g	5456	d-i	47.3	d-g	48.1	n	72.2	c-i	2.1	n
08	954	d-h	5784	b-g	73.6	ab	48.5	n	68.7	i-k	1.6	n
11	949	d-h	5484	d-i	24.2	i-m	69.1	h-j	74.5	a-d	20.1	g-i
09	948	d-h	5595	c-h	14.1	lm	73.7	e-h	69.8	g-j	28.8	de
18	923	e-i	5255	f-j	24.7	i-m	66.8	ij	74.0	b-e	27.5	d-f
20	904	e-i	4991	h-m	74.7	ab	65.5	jk	74.4	a-d	15.9	i-k
29	838	f-j	4782	i-o	52.0	c-f	57.8	lm	71.6	c-i	6.1	mn
23	822	g-j	4629	j-o	36.0	f-j	77.7	de	74.1	b-e	27.7	de
28	778	h-k	4515	k-p	58.7	b-d	78.5	c-e	71.0	d-i	39.1	c
27	775	h-k	5064	h-l	27.6	h-m	84.3	b	72.1	c-i	37.8	c
26	763	i-k	4403	l-p	37.3	e-j	44.7	n	69.0	h-j	1.7	n
07	762	i-k	5128	g-k	85.8	a	61.0	kl	69.6	g-j	9.0	lm
30	751	i-k	4171	op	47.0	d-g	54.3	m	74.8	a-d	19.0	g-j
22	747	i-k	4968	h-m	53.3	c-f	64.2	jk	66.9	jk	17.5	h-k
25	719	jk	4203	n-p	12.7	m	55.4	m	73.9	b-e	1.9	n
24	687	jk	4299	m-p	55.6	cd	75.4	e-g	69.9	f-j	22.4	f-h
10	686	jk	4779	i-o	33.8	g-j	82.2	b-d	65.1	k	28.0	de
19	619	k	4899	h-m	54.0	c-e	70.7	g-i	66.9	jk	15.2	i-k
BSS56	610	k	3825	p	66.7	bc	58.9	lm	72.5	b-h	14.1	j-l
Mean	909		5328		43.2		68.6		72.0		22.8	
LSD	183		705		17.7		5.1		3.8		5.1	
CV%	12.2		8.0		24.5		4.5		3.2		13.7	

Key: ValAc - (value in $/acre), LbPodAc - yield in pounds of pods per acre, PctBlkBr - percent mature pods measured as pods with black or brown hulls by the hull scrape test, G100SMK - weight of 100 sound mature kernels in grams, PctTSMK - percentage of sound mature kernels after shelling, PctELK - percentage of extra large kernels.

The experiment was also grown in Lamb County near Littlefield, on Brad Heffington's farm (Table 2). This location has a shorter growing season, and we expected that runner and bunch lines would not mature well there, but the location could help us identify lines that have good maturity in a shorter season. Yields were lower at this farm than at J. Leek, and immaturity may have been a contributing factor.   Entries 16, 17, and 14 were in the top category for value and yield per acre, similar to the check varieties. Maturity on these entries ranged from 30% to 56%, higher than the 0% and 10% for TamrunOL02 and Florunner. Entries 7, 8, and 28 had the best maturities, from 65% to 71%; at J. Leek, their maturities were also good, ranging from 59% to 86%. However, with the exception of entry 28 at the Heffington farm, these three entries yielded significantly less than the check varieties.

Table 2. F2:7 Runner/Bunch - Brad Heffington Farm - Earth, Lamb Co. - 2005

Entry	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK		PctELK	
Florun.	547	a	3318	a-c	10.0	k-n	56.6	h-l	65.7	a-e	12.5	e-i
TROL02	546	a	3377	ab	0.0	n	64.8	c-g	65.1	a-f	15.8	c-f
NC7	543	a	3417	a	35.9	e-i	88.3	a	62.5	c-g	35.9	a
16	530	ab	3318	a-c	34.0	e-i	56.4	h-l	64.2	b-f	14.9	c-g
17	518	a-c	3203	a-d	30.3	f-j	66.7	b-e	66.6	a-c	24.6	b
Spanco	481	a-d	2863	a-i	82.0	a	49.2	m-p	68.0	ab	3.1	kl
15	469	a-e	3382	ab	40.0	d-g	43.1	p	53.0	jk	0.8	l
14	469	a-e	3153	a-f	56.0	b-d	62.6	d-h	61.7	d-g	19.5	b-d
9	467	a-e	3192	a-e	13.3	j-n	65.3	c-f	59.0	g-i	20.1	bc
28	458	a-f	2911	a-h	70.7	ab	72.0	b	65.9	a-d	25.1	b
11	442	a-g	2791	c-j	16.7	i-n	58.6	g-k	66.1	a-d	10.3	f-j
22	441	a-h	2775	c-j	38.0	d-h	59.5	f-j	63.7	b-f	8.1	h-k
23	432	b-i	2569	g-k	17.3	i-n	60.9	e-i	68.8	a	13.3	e-h
6	429	b-i	2625	f-k	6.0	l-n	55.6	i-l	65.5	a-e	17.7	c-e
19	428	b-i	2761	c-j	20.0	h-m	66.0	b-e	66.0	a-d	10.3	f-j
12	414	c-j	2718	d-j	1.3	mn	61.6	e-i	61.7	d-g	7.6	h-k
8	407	d-j	2603	f-k	66.0	a-c	45.2	op	61.9	d-g	0.4	l
21	404	d-j	2639	e-k	22.0	g-l	64.8	c-g	61.9	d-g	15.4	c-f
13	401	d-j	2948	a-g	30.7	f-j	63.8	d-g	58.7	g-i	17.3	c-e
18	379	d-k	2534	g-k	18.7	h-n	59.3	f-j	64.9	a-f	16.5	c-e
29	363	e-l	2359	h-l	40.1	d-g	52.9	k-m	62.6	c-g	2.3	kl
7	352	f-m	2542	g-k	64.7	a-c	53.5	j-m	61.3	e-g	6.9	i-k
27	344	g-m	2276	j-l	8.7	l-n	70.2	b-c	64.2	a-f	19.3	b-d
25	333	g-m	2126	kl	14.0	j-n	46.8	n-p	60.9	f-h	0.3	l
20	332	h-m	2143	kl	32.0	e-j	54.4	j-m	65.5	a-f	5.1	j-l
30	331	i-m	2321	i-l	32.0	e-j	51.7	l-n	56.5	h-j	9.3	g-j
BSS56	305	j-m	1900	l	51.3	b-e	50.7	l-o	66.1	a-d	5.2	j-l
26	270	k-m	2090	kl	43.6	d-f	43.0	p	47.2	l	0.8	l
24	268	lm	2266	j-l	48.0	c-f	62.5	d-h	55.2	ij	16.5	c-e
10	248	m	2822	b-j	29.3	f-k	68.3	b-d	50.4	kl	14.1	d-g
Mean	412		2731		32.4		59.1		62.0		12.3	
LSD	109		563		19.7		6.3		4.6		5.9	
CV%	16.1		12.6		37.2		6.5		4.5		2.9	

The experiment was also planted in Collingsworth County (Pat White's farm, Wellington), the TAES-Stephenville farm (Erath County), and in Frio County (Phillips farm, Pearsall). We are currently processing the data from Wellington, and it is not available yet. Data from the Stephenville and Pearsall tests are presented in the TPPB - Quality report.

F_4 Spanish Evaluation. We made crosses previously to combine the high-oleic trait with high yield and early maturity in Spanish germplasm. This was done to improve on OLin, which

typically yields about 7% less than Tamspan 90, and which is not as mature as Tamspan 90 at locations with cooler temperatures (for example, Lamb and Moore counties.) These lines are currently in the F_4 generation and were evaluated at the J. Leek farm and at the Brian Patterson farm near Springlake and Earth in Lamb County.

Table 3. F4 Spanish J.Leek Research Farm - Brownfield, Terry Co. - 2005

Entry	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK	
Spanco	1039	a	5788	a	83.33	a-c	53.20	a	73.46	b-f
Tamspan90	1037	ab	5658	ab	85.33	a-c	46.23	h-k	74.83	a-d
Starr	994	a-c	5516	a-c	84.00	a-c	47.17	f-k	74.60	a-d
14	994	a-c	5472	a-c	91.83	ab	48.27	d-i	74.59	a-d
2	982	a-d	5485	a-c	86.00	a-c	50.20	b-d	73.77	a-f
13	982	a-d	5330	a-d	78.00	c	49.20	b-f	75.92	a
3	976	a-d	5247	a-d	84.67	a-c	45.57	jk	76.02	a
OLin	971	a-d	5344	a-d	78.00	c	50.63	bc	74.56	a-d
22	931	a-d	5194	a-d	91.33	ab	46.13	i-k	73.30	c-f
20	920	a-d	5101	a-d	92.00	a	47.57	e-j	73.73	a-f
6	914	a-d	5024	a-d	84.50	a-c	49.50	b-e	74.71	a-d
15	911	a-d	4917	a-d	88.67	a-c	51.37	ab	75.88	a
17	903	a-d	5130	a-d	84.00	a-c	47.10	f-j	71.63	f
1	900	a-d	4904	a-d	83.33	a-c	46.03	i-k	75.75	ab
4	899	a-d	4962	a-d	84.67	a-c	46.63	g-j	74.17	a-e
8	898	a-d	4912	a-d	92.50	a	48.53	c-h	74.85	a-c
24	896	a-d	4936	a-d	80.00	c	47.90	d-i	73.99	a-e
18	894	a-d	5045	a-d	86.67	a-c	48.03	d-i	72.50	d-f
16	891	a-d	4899	a-d	87.33	a-c	46.13	i-k	74.73	a-d
19	877	a-d	4883	a-d	80.00	c	48.83	c-g	73.89	a-f
11	877	a-d	4973	a-d	85.33	a-c	42.50	l	72.17	ef
23	875	a-d	4914	a-d	80.67	bc	47.13	f-j	72.73	c-f
26	868	a-d	4829	b-d	82.67	a-c	46.20	i-k	73.83	a-f
12	867	a-d	4781	b-d	80.67	bc	44.07	kl	74.62	a-d
21	861	b-d	4845	b-d	87.33	a-c	47.77	e-j	72.92	c-f
10	854	cd	4891	a-d	88.00	a-c	49.80	b-e	72.00	ef
25	839	cd	4776	b-d	91.33	ab	47.13	f-j	72.10	ef
9	824	cd	4494	d	86.00	a-c	42.40	l	74.66	a-d
5	813	de	4627	cd	84.67	a-c	47.53	e-j	72.08	ef
7	640	e	3455	e	86.67	a-c	50.67	bc	74.76	a-d
Mean	904		5011		85.3		47.6		74.0	
LSD	178		929		11.24		2.31		2.34	
CV%	12.0%		11.3%		8.1%		3.0%		1.9%	

At the J. Leek farm, several of the F_4 entries yielded as well as the check varieties (Spanco, Tamspan90, Starr, and OLin) (Table 3). Although differences in maturity among the check varieties were not significant, five breeding lines (entries 8, 14, 20, 22, and 25) had more than 91% mature pods; OLin had 78% mature pods. Three of these five lines yielded equal to the checks. Seed size of these five entries was similar to Starr and Tamspan 90. All entries were mature enough to dig at his location, but this was not true at Springlake (see below). Shelling percentages of four of these five lines were similar to the checks.

The experiment was also grown at the Brian Patterson farm near Springlake, and this cooler location highlighted the differences in maturity. Starr and Tamspan 90 had 62% to 66% mature pods, but OLin had only 44% mature pods at digging. The experiment was planted on May, 12, and harvested 141 days after planting. There was greater variability for yield at this location so differences were not statistically significant, but several entries were statistically earlier than OLin, including entry 14, which did well at the J. Leek farm. Further testing is needed this year.

Table 4. F4 Spanish - Brian Patterson Farm - Springlake, Lamb Co. - 2005

Entry	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK		PctELK	
Spanco	780	ns	4450	ns	66.00	a-g	46.67	ab	71.76	a-e	3.71	c-j
Tamspan90	762		4219		62.00	a-h	41.87	e-i	74.04	a-c	3.72	c-j
17	750		4270		57.33	c-h	42.57	d-g	71.85	a-e	4.57	b-f
23	750		4102		57.33	c-h	42.37	d-h	74.04	a-c	4.44	b-g
Starr	747		4318		81.44	ab	41.55	e-i	70.38	ef	2.11	e-k
03	739		4049		69.33	a-f	40.23	f-j	73.58	a-d	1.08	i-k
07	712		3940		68.67	a-f	45.17	a-d	74.56	ab	5.63	b-d
24	709		3875		54.67	d-h	40.50	f-j	74.76	a	2.98	d-k
OLin	708		3967		44.33	gh	47.77	a	73.63	a-d	8.70	a
20	704		3869		60.00	a-h	42.60	c-g	74.62	a	3.91	b-i
05	696		3856		73.33	a-e	40.50	f-j	73.86	a-d	2.01	e-k
06	695		3957		64.00	a-h	45.27	a-d	72.05	a-e	6.02	a-c
16	694		3865		65.33	a-h	38.87	ij	73.17	a-e	1.59	g-k
14	686		3807		78.08	a-d	39.93	g-j	73.71	a-d	2.18	e-k
21	679		3873		72.67	a-e	43.30	c-f	71.74	a-e	5.15	b-d
12	675		3737		77.33	a-d	39.33	h-j	74.04	a-c	2.75	d-k
02	674		4078		80.84	a-c	43.97	b-e	71.44	b-f	6.71	ab
13	651		3771		58.00	b-h	44.07	b-e	73.23	a-e	4.86	b-e
15	646		3628		42.00	h	43.90	b-e	73.07	a-e	3.35	c-k
22	643		3626		58.00	b-h	41.50	e-i	73.28	a-e	3.72	c-j
11	639		3910		72.54	a-e	37.37	j	68.31	f	0.89	jk
04	627		3666		65.33	a-h	38.97	ij	71.67	a-e	1.27	h-k
09	626		3455		83.33	a	39.57	g-j	74.24	a-c	0.69	k
08	623		3555		57.33	c-h	42.50	d-h	71.77	a-e	1.83	f-k
25	611		3517		48.00	f-h	45.77	a-c	70.72	d-f	6.78	ab
18	609		3449		56.00	d-h	42.27	d-h	71.91	a-e	3.28	c-k
19	591		3263		59.33	b-h	43.17	c-f	73.72	a-d	4.66	b-f
01	583		3489		42.00	h	40.17	f-j	71.10	c-f	4.05	b-h
10	569		3643		47.67	f-h	46.73	ab	68.50	f	6.86	ab
26	505		2838		52.00	e-h	42.20	d-h	72.75	a-e	3.96	b-i
Mean	669		3801		62.5		42.4		72.6		3.78	
LSD	162		859		23.64		3.20		3.15		2.96	
CV%	14.6		13.6		23.1		4.6		2.6		47.4	

<u>Spanish x Valencia populations</u>. The goals are to develop a high-oleic Spanish variety that matures better than OLin, and a high-oleic Valencia variety. Selections from crosses made between OLin and Valencia lines were evaluated at three locations - near Springlake (Brian Patterson farm, Lamb County), near Dumas (Darren Stallwitz' farm, Moore County), and between Muleshoe and Clovis (Craig Brashear's farm, Curry Co.) The goal is to develop earlier-maturing high-oleic Spanish varieties and high-oleic Valencias. Data presented is for the

Springlake (Table 5) and the Clovis (Table 6) locations. Samples from the Dumas location are currently being processed.

Several promising Spanish and Valencia lines are present. Entry 14 is a spanish line that had yield, shelling, and maturity similar to Tamspan 90, and was numerically the #1 or #2 entry at both locations for value per acre. However, seed size was larger (about 50g per hundred) than Tamspan 90 (42-44g/100) or OLin (43-44g/100). Although OLin matured well at Springlake, it did not at Clovis, and entry 14 matured better than OLin and similar to Tamspan 90. Entry 7 was early-maturing, significantly earlier than Tamspan 90 at Clovis, and had a maturity similar to Valencia checks at that location. It was similar to the Spanish checks in seed weight and shelling, but yielded less and was lower in value to OLin at Springlake or Tamspan 90 at Clovis.

Table 5. Spanish x Valencia - Brian Patterson Farm - Springlake, Lamb Co. - 2005

Entry	Type	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK	
Tamspan90	Spa	883	a	4849	ab	78.67	ab	42.43	fg	74.54	a-c
14	Spa	874	ab	4964	a	85.33	ab	50.13	b-d	72.38	bc
06	Val	839	a-c	5017	a	76.67	a-c	48.17	b-f	71.33	b-d
05	Mxd	838	a-c	4413	a-c	87.33	ab	43.83	c-g	77.55	a
10	Spa	814	a-d	4729	ab	81.43	ab	48.20	b-f	70.32	c-f
03	Val	764	a-d	4260	a-c	83.33	ab	50.47	bc	73.39	a-c
OLin	Spa	759	a-d	4221	a-c	71.33	b-d	44.27	c-g	73.49	a-c
01	Spa	758	a-d	4654	ab	78.67	ab	44.33	c-g	65.31	fg
13	Mxd	745	a-e	4012	bc	90.67	a	42.77	e-g	75.92	ab
09	Mxd	738	a-e	4300	a-c	84.08	ab	43.17	d-g	71.28	b-d
12	Val	728	b-f	4620	a-c	80.00	ab	48.23	b-f	65.04	g
07	Spa	727	b-f	4117	a-c	82.03	ab	41.07	g	71.51	b-d
NMValC	Val	726	b-f	4247	a-c	74.00	b-d	49.50	b-e	70.20	c-f
11	Val	713	c-f	4157	a-c	83.41	ab	53.80	b	70.63	c-e
X-101	Val	712	c-f	4136	a-c	80.67	ab	49.13	b-f	70.49	c-e
08	Spa	712	c-f	4153	a-c	75.33	a-d	43.93	c-g	70.39	c-f
02	Spa	683	d-g	3948	bc	78.92	ab	46.80	b-g	72.17	bc
04	Spa	596	e-g	3720	c	76.97	a-c	44.47	c-g	66.94	d-g
15	Val	584	fg	4253	a-c	59.85	d	81.83	a	65.75	e-g
16	Val	532	g	4403	a-c	60.67	cd	49.47	b-e	57.41	h
Mean		736		4359		78.47		48.30		70.30	
LSD		153		907		16.61		7.01		5.08	
CV%		12.5		12.6		12.8		8.8		4.4	

Among Valencia entries, entry 6 was statistically similar in all characteristics to New Mexico Valencia and X-101 at Springlake. At Clovis, entry 14 out-yielded the Valencia checks by more than 1200 lb/acre and had better shelling, but was less mature, similar to Tamspan 90. Entry 12 was similar in yield and maturity to the other Valencias at Springlake, but did not shell as well. At Clovis, this entry out-yielded the Valencia checks by more than 1200 lb/acre, and shelled similarly to New Mexico Valencia C, although less than X-101.

Table 6. Spanish x Valencia Crosses - Craig Brashear's Farm - Clovis, Curry Co. - 2005

Entry	Type	ValAc		LbPodAc		PctBlkBr		G100SMK		PctTSMK	
OLin	Spa	921	a	5189	a	25.33	j	43.13	g-k	72.73	a
14	Spa	894	ab	5070	a	51.33	g-i	49.83	c	72.75	a
Tamspan90	Spa	856	a-c	4887	a-c	52.00	f-i	40.10	kl	71.12	a-c
06	Val	766	a-d	4976	ab	54.00	e-h	44.63	d-h	67.31	d-g
07	Spa	756	b-d	4249	b-f	77.33	ab	40.83	i-l	72.87	a
08	Spa	715	c-e	4725	a-d	64.00	c-g	42.13	h-k	67.65	c-f
13	Mxd	711	c-e	4466	a-e	72.67	a-c	42.07	h-k	68.50	b-e
12	Val	694	de	5104	a	72.67	a-c	47.60	c-e	62.71	hi
05	Mxd	677	d-f	4658	a-d	59.33	d-g	44.23	e-i	69.44	a-d
02	Spa	667	d-f	4131	c-f	65.32	b-e	44.97	d-h	69.63	a-d
04	Spa	634	d-f	3651	ef	64.85	b-f	37.50	l	71.91	ab
10	Spa	629	d-f	4860	a-c	62.67	c-g	46.23	d-g	64.53	f-h
03	Val	619	d-f	3763	ef	46.00	hi	45.13	d-h	68.07	c-f
01	Spa	615	d-f	3818	ef	60.67	c-g	40.60	j-l	65.52	e-h
16	Val	568	e-g	4394	a-e	57.33	d-h	63.13	b	63.10	h
X-101	Val	562	e-g	3573	f	70.00	a-d	48.00	cd	68.57	b-e
11	Val	524	f-h	3955	d-f	61.33	c-g	49.90	c	63.73	gh
NMValC	Val	453	gh	3804	ef	81.33	a	46.87	c-f	62.64	hi
15	Val	436	gh	5033	ab	39.33	i	77.43	a	55.36	j
09	Mxd	390	h	3939	d-f	82.00	a	43.83	f-j	59.18	i
Mean		654		4412		60.98		46.91		66.87	
LSD		157		818		13.08		3.42		3.72	
CV%		14.5		11.2		12.9		4.4		3.4	

The major difference between locations was that maturity averaged 78% at Springlake, but only 60% at Clovis. This was reflected in a lower shell-out rate, 67% at Clovis compared to 70% at Springlake. OLin matured well at Springlake (71%) but poorly at Clovis (25%).

In general, the most-promising entries are still segregating for oleic: linoleic fatty acid ratio and seed coat color, and need to be selected further to obtain tan-colored high-oleic Spanish seeds and red-colored high-oleic Valencia seeds.

(2) <u>Make additional crosses with selected early-maturing progeny</u>. We are beginning to make additional crosses between early-maturing runners and high-O/L breeding lines with greater resistance to Sclerotinia and TSWV than Tamrun OL01 and Tamrun OL02. We expect that greater resistance will be needed than is present in current varieties, and so are placing greater emphasis on disease resistance.

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Peanut Genetics

March 15, 2006
NPB Final Report

Title: **Accelerating Development of Peanut Varieties through Molecular Markers**

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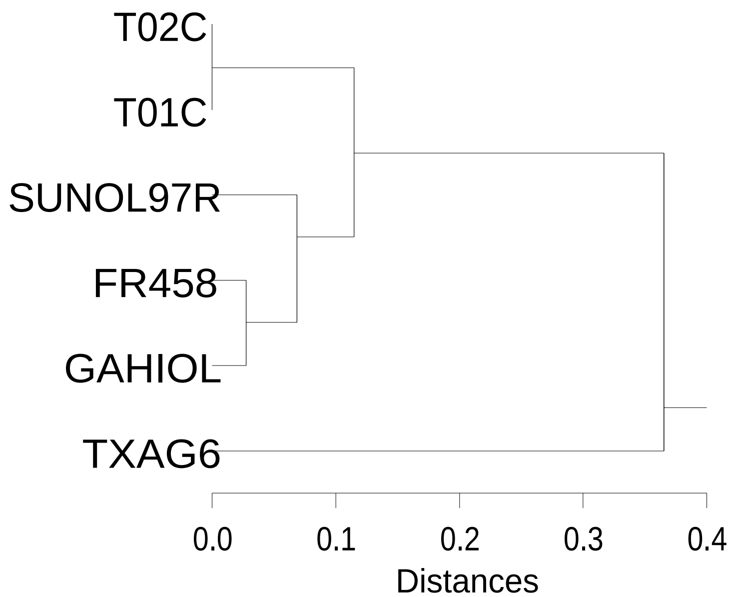
Results to date:

Map published microsatellites (SSRs) on the Florunner x TxAG-6 population. We have used both agarose gels and DNA analyzer-based detection to measure polymorphism. In the case of these parents, many of the polymorphisms are visible by moth detection methods. To data, approximately 40% of the primers used have detected at least one polymorphism between these two parents. Frequently we have observed two bands in each lane, as would be expected for an AABB disomic tetraploid. We have also found these polymorphisms among BC1 progeny of the mapping population. we have seen differences among plants of the mapping population. Based on the 144 primer pairs that we have had synthesized, we would expect insufficient polymorphism to make a map based on these primers alone. However, these can be mapped against the RFLP marker map. In addition, several publications recently have reported additional sets of primers, which when added to the current set should make it possible to construct an independent map of peanut using only SSRs.

Identify microsatellite markers that can be used in our peanut improvement program. The markers are being tested for ability to distinguish between the varieties and populations segregating for early maturity, high O/L, seed size, and plant type. Approximately one quarter of the primers have been able to distinguish differences between this set of cultivated peanut genotypes. Use of agarose gels has not proved satisfactory, because most of the polymorphisms among cultivated accessions are on the order of 2 base pairs (bp) to 4bp difference, too small to resolve. Therefore, we have switched to use of a DNA analyzer for differences. We have been able to distinguish different peanut varieties (see Fig. 1), although plant-to-plant variation of composite lines has been detected, and we are attempting to find a statistical measurement that will allow us to distinguish differences between plant of a variety from differences among varieties. This can be seen especially among Tamrun OL01 and Tamrun OL02, where the two varieties are sister lines, and variation among plants of the same variety so far has appeared to be similar to the variation between the varieties. This means that we need to run additional primers and plants of each variety.

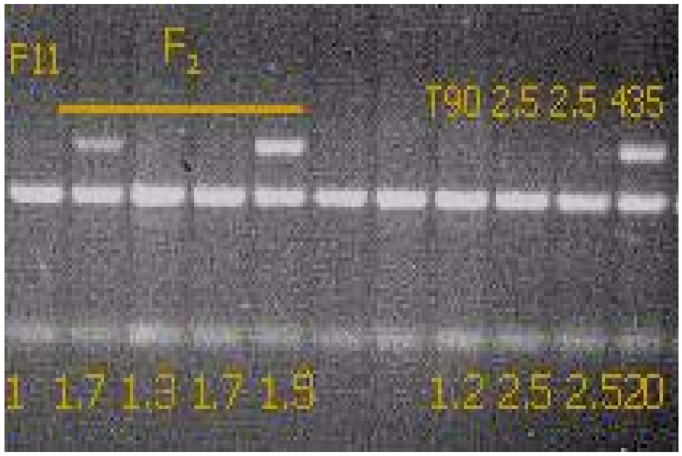
This will be important for using markers to identify hybrids, and also for quality control in seed multiplication.



1Figure 1. Classification of runner varieties using microsatellite markers. TxAG-6 is an interspecific hybrid, and markers show a great difference between this and the cultivated runner varieties.

<u>Markers for the high-O/L trait</u>. We can tell high-O/L from low-O/L parents using markers, but the F2 generation is more difficult. We have identified a pattern that is always present in high-oleic seeds, but this pattern is sometimes also present in low oleic seeds also. Our assumption that we had markers for two independent genes appears to have been incorrect, and so we need to find markers for a second gene for the markers to work. Additional evidence is that two F2 seeds that had O/L ratios of 1.7:1 were planted; the two seeds had different marker patterns. The F3 seeds were harvested and analyzed for their O/L ratios. One plant produced large few high-oleic seeds, and the other produced many such seeds. Therefore these two seeds were genetically different, even though the O/L ratios were the same.

We have used primers to amplify additional desaturase genes, and we have cloned these fragments. These need to be sequenced to confirm that they are indeed desaturase genes, and to look for possible polymorphisms between high-oleic and low-oleic parents that can be used to make markers.



2Figure 2. Markers for the high-oleic trait. The top marker is present in all high-oleic accessions, including UF-435 (rightmost lane), which is the donor parent for the high-oleic trait. Two lanes with a 1.7:1 ratio can be seen (the second and fourth from the left).

Acknowledgments. We express our sincere appreciation to the National Peanut Board, the Texas Peanut Producers Board, and the Texas Peanut Producers for assisting our program again in 2005. A large part of the work reported here would not have been possible without this generous support.

Subject: **Peanut Breeding** **March 13, 2006**

Title: **Heritability Estimates for High Yield Traits transferred from Wild Species Hybrids to a Conventional Variety**

Personnel: Michael R. Baring, Soil and Crop Sciences Dept., 2474 TAMU, College Station, Tx. 77843-2474. Ph#979-845-4273 m-baring@tamu.edu
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Progress Report

The original strategy for this study included four F_2 generation populations arising from four individual F_1 generation crosses between our disease resistant high O/L lines and high yielding wild species derived hybrids. We had planned to use 80 F_2 plants, 20 F_1 plants, 20 P_1 (Parent 1) plants, and 20 P_2 (Parent 2) plants. Upon an extended literature review, it was determined that the F_2 populations needed to be much larger than the original 80 specified in the proposal due to the variability expected within the population. So, on June 19, 2005 the experiment was planted at the College Station nursery using two F_2 populations instead of the original four with 220 F_2 plants, 20 F_1 plants, 20 P_1 plants and 20 P_2 plants for each population. Only two populations were used because the size of each population was doubled from the original strategy and this limited space availability and labor.

The pedigree of P_1 in population one is Tamrun OL 01 and P_2 is TP301-209. The pedigree of P_1 in population two is also Tamrun OL 01 and P_2 is TP301-33. These two populations were chosen because they had the highest measured F_1 hybrid vigor in terms of yield. The plants from each population are planted on a 36" row spacing at 36" apart. The test plots consisted of 14 plants per range (F_2=11plants, F_1=1 plant, P_1=1 plant, P_2=1 plant, all randomized for each range) and 20 ranges deep for a total of 280 plants.

All plants were hand harvested and picked by hand to determine individual plant yields. Yields were measured in grams of pods harvested. SAS Proc Means was used to analyze the means and the standard deviations for each of the groups; F_1's, F_2's, P_1's and P_2's.

Theoretically, the (F_1's, P_1's, and P_2's) are each homozygous within their respective group, so, all of the phenotypic variation is due to environmental effects. Therefore, if V_G=0, then V_E=V_P. The average environmental effect for the entire experiment can be estimated by averaging the variation of the three homozygous groups. The first population had the following variances recorded. The variation for the F_1 group was 66.46. The variation for the P_1 group was 45.7 and the P_2 group was 37.2. The average environmental variation for these three groups was (66.46+45.7+37.2)/3=**<u>49.77</u>**=V_E. This value is an estimate of the V_E for the F_2 group which had a phenotypic variance of 70.5 because this group was grown under the same environment.

To get a Broad-sense (H^2) heritability estimate for the high yield trait, we simply modify the equation to read $V_G=V_P-V_E$ ($V_G=70.5-49.77=$**20.73**). $H^2=V_G/(V_G+V_E)$ so, $H^2=20.73/70.5$**=.294**. This indicates that about 29.4% of the phenotypic variation that is measured in the individual plant yields can be attributed to genetics while the remaining 70.6% of the variation can be attributed to environmental effects. The second population was very similar with a $H^2=.313$ or 31.3% of the variation due to genetics.

These numbers indicate that there is a low rate of heritability for selecting high yields in early generation material such as the F2's and that environmental variation could cause plants with good yield potential to be discarded during selection and plants with poor yield potential to be retained.

The study will be conducted again in 2006 to confirm these findings. Additionally, single seed decent is being performed on all of the harvested plants in the winter nursery. These generation advances will be carried out until the 5th generation which will enable us to run a generation means analysis to determine which generation would be the ideal generation of selection in terms of selecting for higher yield potential.

National Peanut Board –Annual Report for 2005

Date: 15 March 2006
Project Title: Introgression of nematode resistance into peanut genotypes with resistance to the tomato spotted wilt virus
PIs: James L. Starr, Dept Plant Pathology and Microbiology, Texas Agricultural Experiment Station, College Station; and Charles E. Simpson, Texas Agricultural Experiment Station, Stephenville

Proposed achievements for 2005:

1. Begin field testing selected lines developed for resistance to root-knot nematodes and TSWV for yield potential and virus resistance.
2. Evaluate several isolates of *Botrytis cinerea*, cause of Botrytis blight of peanut for fungicide sensitivity.
3. Screen common peanut cultivars for resistance to Botrytis blight

Achievements:

1: Twelve breeding lines were evaluated for yield potential at four locations in 2005, two locations were nematode infested and two locations were non-infested. These lines were also sent to Tifton, GA for evaluation of TSWV resistance by USDA-ARS collaborator (P. Timper). The breeding lines all had higher yield potential than the nematode-susceptible cultivars Florunner, Tamrun 96 and Tamrun O/L 02 in the nematode-infested fields (Fig. 1) and two lines had yields that were numerically higher than yield of NemaTAM. In the non-infested locations, yields of several lines were similar to that of Tamrun O/L 02 (Fig. 1). It was notable that at the Stephenville test site, six breeding lines had pod yields of greater than 6,000 lb/acre. With one exception, all of the breeding lines suppressed nematode population densities relative to the susceptible cultivars (Fig. 2). The exception (PR11 at nematode-infested location 1) was likely due to segregation of the nematode-resistance gene.

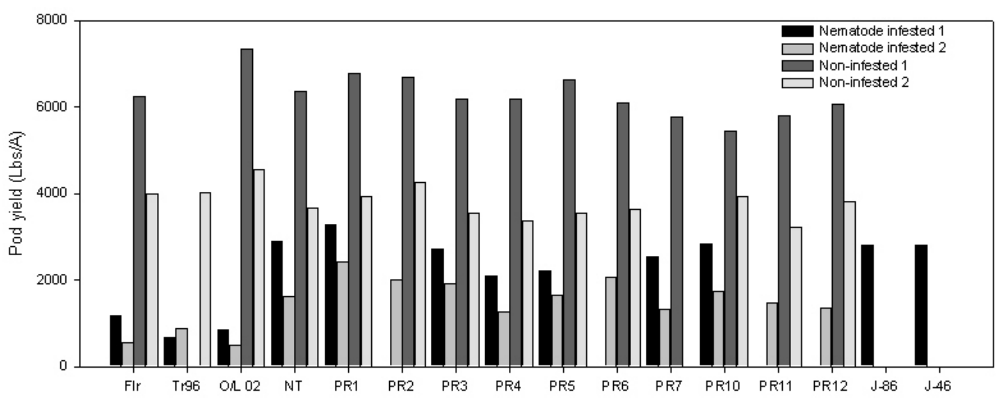
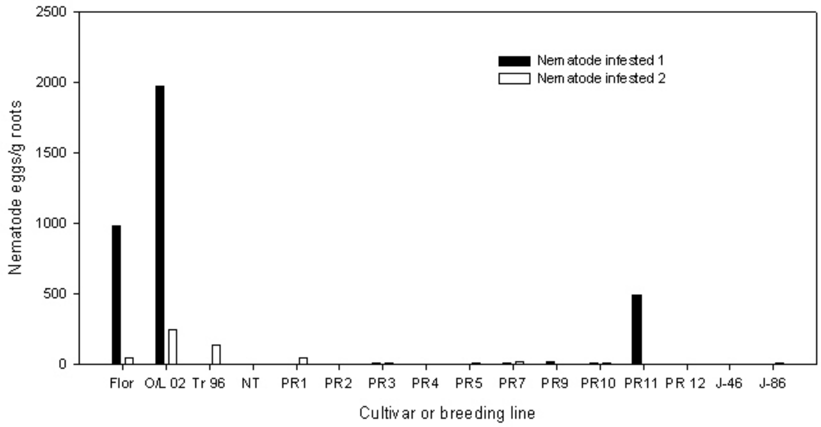


Fig 1. Yield potential of several peanut cultivars and breeding lines (with resistance to root-knot nematodes and Tomato Spotted Wilt Virus) in nematode infested and non-infested plots. (Flr = Florunner, TR96 = Tamrun 96, O/L 02 = Tamrun O/L 02, NT = NemaTAM)

Fig. 2 . Final nematode population densities on several breeding lines with nematode and TSWV resistance in nematode-infested fields compared to nematode susceptible cultivars. (Flr = Florunner, TR96 = Tamrun 96, O/L 02 = Tamrun O/L 02, NT = NemaTAM)



These twelve breeding lines were rated for percentage of plants exhibiting symptoms of virus disease twice during the growing season at the Tifton, GA location. All but two lines had lower incidence of virus disease than did Florunner (Fig. 3). One line had a TSWV rating lower than Georgia Green and another line was intermediate between Georgia Green and Tamrun 96.

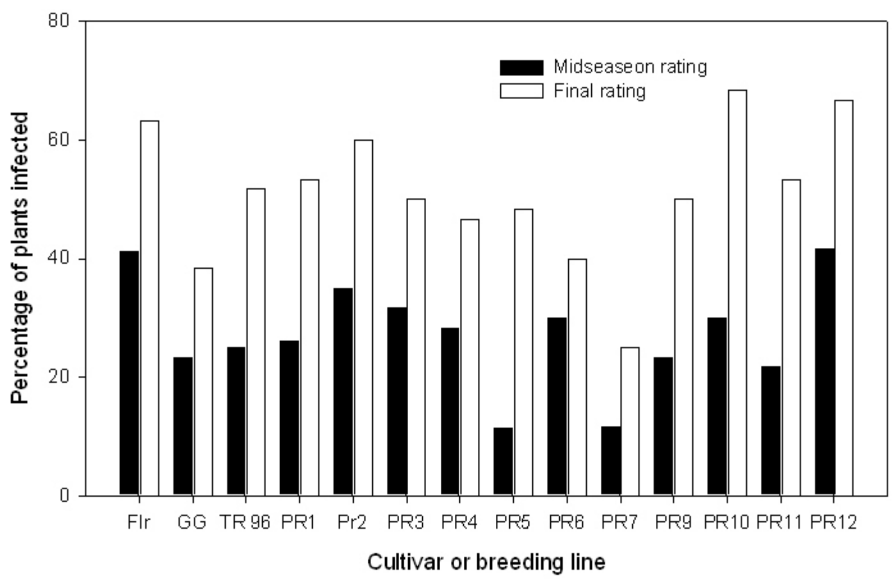


Fig. 3. Comparison of Tomato Spotted Wilt Virus ratings of several breeding lines and cultivars grown in Tifton, GA. (Flr = Florunner, TR96 = Tamrun 96, GG = Georgia Green).

2. More than 50 isolates of *B. cinerea* were collected from peanut in west Texas in the fall of 2004 following an unusually high incidence of Botrytis blight. All isolates were screened for sensitivity to four fungicides commonly used on peanut. Several isolates were identified that were relatively tolerant of the fungicides Omega (fluazinam), Botran (dicloran), and Topsin-M (thiophenate-methyl) (data not shown). No isolate was tolerant of Roval (iprodione)

3: In laboratory tests, 29% of isolates of *B. cinerea* were nonpathogenic. All pathogenic isolates caused greater disease at 20ºC (68F) than at 24ºC (75F) or 28ºC (82F). Ten common peanut cultivars were evaluated in laboratory tests for susceptibility or resistance to Botrytis blight using two isolates of the pathogen. All cultivars became infected, with isolate GilE-6 generally causing more disease than did isolate DM1-R. However, rate of disease development on Flavorrunner 458, the breeding line TX607, and Valencia C was lower than on other cultivars inoculated with isolate GilE-6 (Fig. 4). The resistance of TX607 was less evident when the plants were inoculated with pathogen isolate DM1-R.

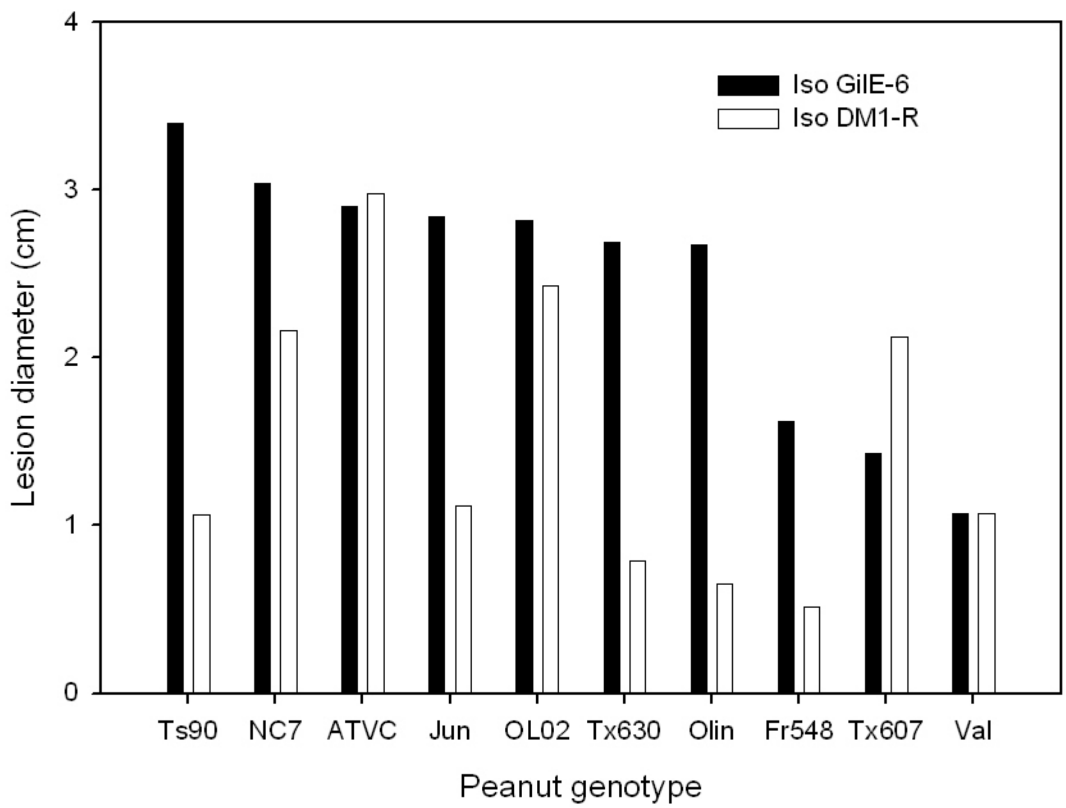


Fig. 4. Variation is susceptibility of several peanut cultivars to Botrytis blight in laboratory tests.

Summary:

Continued progress was achieved in the development of peanut with multiple disease resistance. Importantly, two of these lines also have the high O/L ratio desired by many shellers. Future emphasis will be the development of peanut with multiple disease resistance and the high O/L trait.

Most isolates of *Botrytis cinerea* collected from peanut in west Texas were pathogenic to peanut and were sensitive to several fungicides. However, significant variation in fungicide sensitivity was observed, suggesting that the potential for inadequate control following fungicide application may be observed in some fields. If Botrytis blight continues to be a problem in west Texas, field evaluation of several fungicides will be needed along with a system for monitoring pathogen populations for development of high levels of tolerance to commonly used fungicides. Finally, sufficient variation in susceptibility to Botrytis blight was observed among the 10 cultivars tested to suggest that useful levels of resistance might exist. These and other cultivars and breeding lines need to be tested under field conditions to confirm laboratory observations.

Acknowledgements:

We thank the Texas Peanut Producers Board for their continued support of this effort through the National Peanut Board funds. We also thank Dr. P. Timper (USDA-ARS, Tifton GA) for assistance in the evaluation of resistance to tomato spotted wilt virus; to Mr. D. Keith and G. Bingham for allowing us to plant our tests on their farms, and finally to Drs. T. Wheeler, C. M. Kenerley, Ms M. Henry for collection and isolation of the *Botrytis cinerea* used in these studies.

Peanut Breeding
2005 Project
Funding from January 1, 2005 to December 31, 2005

Title of Project:

Peanut quality evaluations of Texas Peanut Breeding lines (in developing new Varieties with Early Maturity and/or Resistance to Root-knot Nematode, Sclerotinia blight, Southern blight, Leafspot, and Tomato Spotted Wilt Virus and with High O/L.)

Researchers: Charles E. Simpson[1], Mark D. Burow[2], and Michael R. Baring[3]

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The objective of this project is to have quality analyses run on as many peanut breeding line samples as we can, and to obtain data that will help us to identify high quality lines for further development, but to also identify as early as possible lines that may have undesirable quality traits so the line can be discarded before a lot of time and effort is expended on the line.

The two major sets of samples we obtained data on in 2005 were the two lines we have proposed for release and the closely related (in some cases sister lines) to assist us in making the decision on which lines should be pushed forward toward release. This information proved to be of utmost benefit because in the case of the large seeded Spanish line proposed for release, we had five total lines, and after the production, yield, and grade data were analyzed, we had chosen two lines as probable candidates for seed increase, with both being about equal in virtually all respects. We (the breeding team, Dr. Mark Burow, leader, Mr. Michael Baring, Dr. Yolanda Lopez, and Dr. C.E. Simpson) met and decided the two lines were best, but we lacked one piece of data – blanching. Line A was tentatively selected, pending blanching reports. After the blanching we were informed that Line A would be a serious problem for the split-blanch manufacturers. Thus, the decision was easily made; we apply for release on Line B, Tx034342.

The decision was not so dramatic for the runner line proposed for release, but the quality data played a significant part in deciding which line to select.

Some of the data we obtained in 2005 were a little surprising in that the large seeded Spanish lines we were evaluating for possible release were higher in sugar content than we had anticipated. Although the percentage sugar was generally in the 4.6 to 4.7% range, some sites and lines had numbers up to 5.2%, alerting us that care must be exercised in selecting within segregating populations in West Texas.

The samples run from the Lubbock location were mostly of advanced breeding material to determine specific traits such as sugar content and/or O/L ratio as they related to maturity aspects of the individual and collective lines.

Plant Pathology
NPB 05 Report, March 9, 2006

TITLE: Spotted Wilt Resistance Mechanisms

PERSONNEL: Mark C. Black, Noel N. Troxclair, Michael R. Baring, Texas Cooperative Extension, Uvalde and Texas Agricultural Experiment Station, College Station, Texas A&M University.

SUMMARY: We continued to gather evidence that field resistance in runner peanut varieties to TSWV involves plant canopy characteristics. We hypothesize that canopy traits affect vector thrips behavior. We repeated the variety vegetative plant mapping in 2005 non-prominent main stems again were related to reduced spotted wilt risk. Regression analysis to explain spotted wilt differences consistently included one of the calculated variables for ratio of main stem length and one or more secondary stem lengths (RMSSS…). We are increasing our understanding of plant types that are highly vulnerable during spotted wilt epidemics and also plant types that hold up well to TSWV. This has potential for selection even in years with little spotted wilt pressure. The traits related to spotted wilt variety ratings do not indicate a simply inherited disease resistance. Rather, these canopy traits fall in the category of 'field resistance' that is polygenically inherited. This type of 'field resistance' should be stable and additive with the low levels of 'true resistance' available in some lines.

INTRODUCTION: *Tomato spotted wilt virus* (TSWV) suddenly became the biggest threat to peanut production in Southwest Texas in the early 1980s. A few years later this also happened in Central Texas, Alabama, Georgia and Florida. Every peanut producing state has reported problems with spotted wilt since 1990 and problems still occur in Southwest Texas. Several southwest Texas growers had severe losses in 2004 and 2005. State and USDA breeding programs in Texas, Georgia, Florida, North Carolina and one private company have developed and released cultivars that perform better than old standard varieties under TSWV pressure. Some cultivars that hold up well have been rapidly accepted in high risk growing areas and breeding work seeks to improve this resistance. The partial resistance appears to be stable but resistance mechanisms are not well understood. Some varieties have premature vine death following heat and drought with symptoms somewhat similar to late-season spotted wilt symptoms. New varieties for Texas should have both virus and stress resistance/tolerance. Variety development proceeds slowly with labor-intensive field selection for disease and stress resistance.

In our 2002 work, some level of 'true' resistance to *Tomato spotted wilt virus* (TSWV) was confirmed in growth chamber tests, in agreement with work done in Georgia. Inoculations of peanut seedlings with TSWV usually identified the most susceptible and most resistant entries, but usually did not rank intermediate varieties consistent with rankings from field data. Field observations and greenhouse work suggested that plant canopy shape may contribute to variety reaction during spotted wilt epidemics. Selecting breeding lines with certain canopy characteristics may be a useful trait for breeders to use when selecting early generation breeding lines for use in regions with spotted wilt and southern blight disease problems. Thrips behavior may be affected by plant canopy shape or other canopy characteristics. The benefits of twin-rows and high seeding rates (resulting in high plant populations) during seasons with spotted wilt epidemics may also be due in part to altered thrips behavior related to more rapid row cover and a more uniform (dense) canopy surface.

Advantages of traditional plant breeding with field evaluation include increased probability of selecting stable multiple-component resistance and opportunities to select for resistance to multiple diseases, environmental stress, pod traits, and yield. Disadvantages of field evaluations for almost all breeding lines generations and the release of new varieties are the slow pace (8-10+ years), uncertainty of disease occurring in plots a given year, and the expense of multiple year field tests for large numbers of lines. Discovery of peanut plant traits in the seedling stage related to spotted wilt resistance would help us discard many susceptible lines earlier and save time and expenses in the field. Knowledge of TSWV resistance mechanisms will also provide a knowledge base for long term stable use of resistance mechanisms.

The objective was to identify peanut resistance/tolerance mechanisms to thrips-vectored TSWV that will predict field performance of varieties and breeding lines.

MATERIALS and METHODS: Nine peanut varieties and two breeding lines (11 entries) were mapped for vegetative stem growth for the third year. The experimental design with two-row 13-ft plots was a randomized complete block with four replications. Whole plants were destructively sampled on 29Jun, 5Aug, and 6Sep by removing a minimum of three plants in 1 row-ft from each of the two rows per plot (target was six plants per plot). The resulting gaps were measured after each sampling date to estimate stand (plants per row ft). Total number plants sampled and all branch lengths on the six largest plants were recorded (primary, secondary, tertiary, quaternary, quinary). Spotted wilt was rated 19Jul, 6Sep, and 4Oct. Plot averages (six plants) for each stem and several other variables were calculated. Data were compared using analysis of variance (PC-SAS Proc ANOVA), Pearson correlation (Proc CORR), and stepwise regression (Proc REG; model selection also based on minimum C(p) statistic).

RESULTS AND DISCUSSION: Spotted wilt was moderate-to-severe in this test, and variety rank on all three dates was about as we expected (Table 1). Tamrun88 had the most disease on all dates. C11-2-39 had (or tied for) the least on all dates. It is interesting that GeorgiaGreen and US224, the two entries with the smallest early season plant size (Table 2), ranked higher for disease early (Table1; also compare ratings to test average on that date), but not late in the season. This is probably due to the delayed lapping of middles.

Highly TSWV-susceptible varieties tended to have taller main stems throughout the season (Table 2). However, TSWV-resistant ViruGard, the only virginia bunch plant type in the test, was tall early. Greater secondary stem 1 (Table 2) and 2 (data not shown) lengths were also a common trait of TSWV-susceptibility.

Tamrun96, TamrunOL01, and TamrunOL02 generally had low total stem numbers (Table 2). This uncluttered zone at the crown may contribute to lower southern blight ratings in previous years and in other tests and may help explain why these varieties hold up better than most other runners to Sclerotinia blight . Tamrun96, TamrunOL01, and TamrunOL02 ranked lowest for total stem length on 6Sep (Table 2) even though growers in Southwest Texas perceive these varieties as large and “stemmy.” The greater difficulty in digging (prone to not roll over completely) is probably due to the less prominent main stems and more prominent upper secondary stems. Reduced branching contributed to low total stem lengths, and the three Texas varieties apparently have more rigid stems at maturity. Stem strengths may help explain different variety tolerances to various environmental stresses observed in years (hot dry weather late).

Numerous correlations of stem traits with all three spotted wilt disease ratings were significant (Table 3A). Significant correlations of spotted wilt with main branch lengths, [height (main stem) and canopy width (secondary branches 1,,3,4,5,8,9)] were positive 13 of 14 times. Significant correlations of spotted wilt with higher order branches (tertiary, quaternary, quinary) were sometimes positive and sometimes negative. Data for 2003 and 2005 were more alike than those of 2004. We suspect weather x variety interactions for vegetative growth.

Thirty-eight of 42 significant correlations between spotted wilt and calculated variables (Table 3B, rows TtNoSSt through RMSTS) were positive, supporting our hypothesis of higher risk of large plants and prominent main stems compared to secondary stems.

Regression of all variety stem characteristics and several calculated variables with spotted wilt ratings on three dates explained low but significant portions of total variation in spotted wilt disease (Table 4). Two of eight significant models had positive terms for a secondary stem (S2 or S3) length and only one significant model had a negative effect for a secondary stem (S1). All nine models (eight were significant at *P*=0.05) had a positive term for one of the rations between main stem length and one or more secondary stem lengths.

Production practices that modify canopy shape in peanut fields also reduce spotted wilt, *i.e.*, twin vs. single rows and high plant populations. Main stems are less prominent, and bare soil is covered earlier in the season.

Vegetative plant mapping was very labor intensive and many additional statistical analyses will be done with these data. Due to the high number of zeros in the data, appropriate data transformations will be used before publication. The 11 entries chosen for this test represent very diverse genetic backgrounds, and more consistent variables in regression equations would be expected for plant mapping of breeding lines from similar backgrounds.

Significant differences for spotted wilt reactions occur in almost all collections of peanut breeding lines. The exception has been with field tests of closely related sister lines (e.g. lines generated by repeated backcrosses to Tamrun 96).

There are not one or two easily measured traits related to spotted wilt reaction in the seedling stage that breeders could use for early screening in the greenhouse or winter nursery. The best disease correlations with vegetative growth traits varied somewhat among the three years of plant mapping, but these is commonality. We continue to gain understanding of plant types that are highly vulnerable and this can be used in years with little spotted wilt pressure.

The traits related to spotted wilt variety ratings explored in this report do not fit the classical definition of disease resistance, although at least one entry (C11-2-39) does have a low level of 'true resistance.' Rather, these canopy traits we identified fall in the category of 'field resistance' (some varieties/breeding lines have less disease in the field than would be expected based solely on laboratory tests). Fortunately, this type of 'field resistance' is stable to date, and even when epidemics occur, there should always be a similar rank of known susceptible and known resistant entries. The Georgia and Florida university breeding programs are using somewhat different genetics than Texas breeders for spotted wilt resistance, with the former apparently relying more on both dense-low spreading-highly branched canopy and some 'true resistance' to TSWV; those canopies are apparently more prone to southern blight, Sclerotinia blight, and heat stress. The Texas program apparently uses genetics for a less branched canopy that may have advantages for field resistance to southern blight, Sclerotinia blight, and summer stress.

Field testing and screening breeding lines at locations with risk of spotted wilt should continue. Work will continue on defining traits for use in field selections when disease intensity if low or absent.

ACKNOWLEDGMENTS: Texas Peanut Producers Board provided partial funding through National Peanut Board funds. We thank Alfred Sanchez, James 'Bud' Davis, and Marvin Saenz for technical assistance; Maggie Gunn for secretarial service; and Murray Phillips, Brad Easterling, and Jaime Lopez for support and help with the field plots.

Table1. Spotted wilt in peanut plots of eleven varieties and breeding lines for plant mapping at Phillips Farm in Frio County, TX, 2005.

	Spotted wilt, % row ft		
Entry	**19Jul**	**6Sep**	**4Oct**
Tamrun88	4.4	76.6	97.6
FlavoRunner458	0.0	37.3	81.2
Florunner	2.1	28.4	70.3
GeoGreen	3.2	14.7	65.1
TamrunOL01	1.1	9.9	56.4
Virugard	0.0	7.7	46.8
US224	3.2	19.6	45.0
SouthernRunner	1.1	14.9	40.0
TamrunOL02	0.0	9.7	38.8
Tamrun96	0.0	7.1	37.5
C11-2-39	0.0	3.7	32.5
Average	**1.4**	**20.9**	**55.6**
LSD 0.05*	**N.S.**	**17.6**	**17.7**
CV, %**	**208**	**58**	**22**

* Least significant difference at *P*=0.05
**Low C.V. (Coefficient of Variation) indicates more consistent data.

Table 2. Selected peanut stem measurements for eleven varieties or breeding lines, Phillips Farm, Frio County, TX, 2005.

	Number of main stem leaves			Main stem length, cm			Secondary stem 1 length, cm		
Entry	**29Jun**	**5Aug**	**6Sep**	**29Jun**	**5Aug**	**6Sep**	**29Jun**	**5Aug**	**6Sep**
TR88	10.8	21.2	25.1	13.7	40.3	46.1	17.8	62.8	70.8
FR458	10.5	18.9	24.3	14.0	34.3	41.6	18.6	62.0	76.4
Florunne	10.3	19.3	24.0	14.7	40.2	43.5	19.2	64.5	76.2
GeoGreen	10.5	19.8	24.5	9.4	31.1	35.0	16.5	53.5	60.7
TROL01	11.1	18.8	22.0	13.0	31.8	34.3	17.8	57.3	65.5
Virugard	11.0	20.2	23.3	14.2	34.2	38.3	17.5	55.2	63.8
US224	10.2	19.0	23.2	8.3	23.7	34.2	11.2	38.5	52.2
SoRunner	11.0	19.7	25.2	12.6	35.5	45.8	18.7	59.0	70.8
TROL02	10.3	17.9	23.7	12.1	31.6	38.2	17.8	53.5	67.8
TR96	10.5	18.4	23.2	13.0	34.1	38.4	17.6	56.4	63.5
C11-2-39	10.3	19.9	25.2	11.8	28.3	36.7	18.0	59.9	72.7
Average	**10.6**	**19.4**	**24.0**	**12.4**	**33.2**	**39.3**	**17.3**	**56.6**	**67.3**
LSD0.05*	**NS**	**1.4**	**1.9**	**2.1**	**2.8**	**4.1**	**2.0**	**5.2**	**8.2**
CV, %**	**6**	**5**	**5**	**12**	**6**	**7**	**8**	**6**	**8**

continued….

Table 2 continued…

	Number of stems, total			Total stem length, cm			RMSSS		
Entry	**29Jun**	**5Aug**	**6Sep**	**29Jun**	**5Aug**	**6Sep**	**29Jun**	**5Aug**	**6Sep**
TR88	13.8	44.2	48.7	122	1054	1173	1.09	1.30	1.47
FR458	18.0	53.1	64.8	157	1095	1624	1.10	1.19	1.19
Florunne	16.8	51.9	57.8	148	1178	1583	1.19	1.25	1.21
GeoGreen	20.7	55.3	62.6	154	1108	1440	0.88	0.97	1.05
TROL01	12.0	23.6	27.1	130	670	840	0.98	0.99	0.95
Virugard	20.5	68.8	74.1	177	1478	1942	1.14	1.09	1.10
US224	14.5	48.2	69.0	80	667	1249	1.08	1.08	1.07
SoRunner	18.4	45.8	52.4	166	1086	1325	0.98	1.11	1.30
TROL02	15.5	39.6	43.0	134	881	1080	0.96	0.99	1.16
TR96	10.8	26.9	31.7	112	734	947	1.03	0.98	1.09
C11-2-39	15.3	62.9	62.1	127	1210	1438	1.01	0.95	1.06
Average	**16.0**	**47.3**	**53.9**	**137**	**1015**	**1331**	**1.04**	**1.08**	**1.15**
LSD0.05*	**3.3**	**11.5**	**13.6**	**32**	**245**	**341**	**0.12**	**0.12**	**0.19**
CV, %**	**14**	**17**	**17**	**16**	**17**	**18**	**8**	**8**	**11**

*Averages followed by the same letter are not significantly different at *P*=0.05 by Least Significant Difference (LSD). Differences were not significant if averages have no letters.
**Low C.V. (Coefficient of Variation) indicates more consistent data.

Table3. Significant (*P*≤0.05) Pearson correlation coefficients (N=44) for three spotted wilt disease ratings with selected peanut stem characteristics from three sampling dates for eleven varieties and breeding lines at Phillips Farm in Frio County, TX, 2005.

	Spotted wilt, % row ft								
Disease rating date	**19Jul**			**6Sep**			**4Oct**		
Plant sample date	**29Jun**	**5Aug**	**6Sep**	**29Jun**	**5Aug**	**6Sep**	**29Jun**	**5Aug**	**6Sep**
A. Stem length^z ----------									
MS (main stem)					+.45**	+.45**		+.46**	+.31*
S1	-.33*							+.34*	
S1T1Q1					-.33*				
S1T1Q2					-.30*				
S1T1Q3					-.32*				
S1T2Q1					-.31*				
S1T3					+.32*			+.30*	
S1T4Q5					+.40**				
S1T4Q6					+.54**			+.32*	
S1T5Q3		+.39**			+.35*				
S1T5Q4		+.39**			+.35*				
S1T6					+.39**				
S1T7					+.33*				
S1T8					+.38*				
S1T9		+.35*							
S1T10		+.34*							
S1T11		+.39**			+.35*				
S2T1	-.31*								

Table 3 is continued on next page…

Table 3 continued….

S2T2						+.30*			
S2T3Q1V1			+.41**			+.36*			
S2T5					+.29*				+.31*
S2T6									+.36*
S2T6Q2			+.51**						+.34*
S3						+.30*			+.31*
S3T1	-.31*					-.35*			-.46**
S3T2Q1	+.39**								
S3T5	+.61**								
S4					+.31*			+.41**	
S5					+.31*			+.35*	
S5T3	+.45**								
S6T1Q2			+.52**						
S6T2	+.61**								
S7T2									-.31*
S8								+.32*	
S9									+.31*

	Spotted wilt, % row ft								
Disease rating date	**22Jul**			**17Aug**			**6Oct**		
Plant sample date	**29Jun**	**28Jul**	**7Sep**	**29Jun**	**28Jul**	**7Sep**	**29Jun**	**28Jul**	**7Sep**
B. Calculated variables									
TtNoSSt						+.32*		+.33*	+.34*
TtSStemL								+.31*	
TStemL	-.31*			-.29*					
S12L	-.31*							+.32*	
S34L								+.36*	+.30*
S1234L	-.30*							+.35*	
SmMSS1_4	-.29*							+.38*	+.29*
MSxxS1_4					+.41**	+.38*		+.47**	+.33*
MSnodeL					+.32*	+.34*		+.34*	+.30*
MSLvs					+.30*	+.31*		+.31*	
RMSSS1					+.36*				
RMSSS2					+.32*	+.37*			
RMSSS1_2					+.36*	+.32*			
RMSSS1_4					+.38*				
RMSSS					+.59**			+.56**	
MSSS						+.48***			+.34*
RMSTS				+.49**	+.32*	+.30*	+.31*		
RSSTS	+.33*			+.45**				-.30*	

[z]Stem length was an average of six plants per plot. Calculated variables were based on averages of previous variables for each plot. There were four replications, N=44. MS=main stem; S, SS and SSt=secondary stem; T= and TS=tertiary stem; Q= quaternary stem; V=quinary stem; Tt=total; R=ratio (of stems described); 1_2=1 and 2; 1_4=1, 2, 3, and 4; no number indicated an average of all SS. on that date.

[y]Asterisks (one, two) indicate significance at $P \leq 0.05$ and $P \leq 0.01$, respectively.

Table 4. Regression analysis of plant mapping data (three dates, destructive sampling) for 11 varieties or breeding lines and spotted wilt disease ratings at Phillips Farm in Frio County, TX, 2005.

Sample date	Disease rating date	Best regression equation[z]	Model P > F	R^2
29Jun	19Jul	SW = 2.12 – 0.25S1 + 1.66RSSTS	0.02	0.17
	6Sep	SW = -24.45 + 19.49RMSTS	<0.001	0.24
	4Oct	SW = -15.92 + 2.19S3 + 17.64RMSTS	0.02	0.17
5Aug	19Jul	SW = -5.92 + 12.05RMSS1	N.S.	0.08
	6Sep	SW = -69.86 + 80.72RMSSS	<0.001	0.35
	4Oct	SW = -77.47 + 0.68S2 + 85.99RMSSS	<0.001	0.37
6Sep	19Jul	SW = -14.94 + 0.42MSLvs + 10.32RMSSS12	0.04	0.15
	6Sep	SW = -44.28 + 53.69RMSSS	0.001	0.23
	4Oct	SW = 4.10 + 42.89RMSSS	0.03	0.11

[z]Equations were estimated by PC-SAS Proc Regression using Stepwise option and minimum C(p) statistic. Six whole plants were collected from each plot on each date. Stem descriptions are

SW = spotted wilt (% row ft with noteworthy symptoms)
MS = average length of main (primary) stem 1 (cm)
S1 = average length of secondary stem 1 (cm)
S2 = average length of secondary stem 2 (cm)
S3 = average length of secondary stem 3 (cm)
S4 = average length of secondary stem 4 (cm)
S6 = average length of secondary stem 6 (cm)
SStmL = average total/plant secondary [arising from main(primary)] stem length (cm)
TStmL = average total/plant tertiary stem length
TtSStmL = average total/plant secondary stem lengths (cm)
TtTStmL = average total/plant tertiary (from secondary stems) stem lengths (cm)
TtQStmL = average total/plant quaternary (from tertiary stems) stem lengths (cm)
TtNoStm = average total number all stems/plant (cm)
TtNoTSt = average total number tertiary stems/plant (cm)
RMSSS12 = average ratio of main stem length to average of secondary stems 1 and 2
RMSSS1 = average ratio of main stem length to secondary stem 1 length
MSxxS1_4 = product of main stem length and the average length of secondary stems 1-4
MSSS = ratio of average main stem length/plot to average secondary stem length /plot.

Grower Application of AU-Pnut Fungicide Spray Advisory on Peanut in South Texas

A. J. Jaks and W. J. Grichar

SUMMARY

Moderate disease pressure from leaf spot caused by prevalent weather conditions occurred in the test. As a result, three fungicide sprays were applied according to the AU-Pnut fungicide advisory by the grower. Four routine fungicide sprays were applied as a comparison simulating normal grower applications. A fifth routine spray was not applied due to the moderate disease pressure. There was no statistical difference in leaf spot infection, yield, grade or dollar value per acre between the three spray advisory and the four spray routine treatments.

INTRODUCTION

At present there is no fungicide advisory program in use in Texas, although advisories are used effectively in other peanut growing regions of the country. Texas growers do not normally apply seven fungicide applications on a calendar schedule as is common in the southeastern area of the United States. Fungicide applications in south Texas may vary from two to five sprays in a normal season. Periods of high humidity with leaf wetness caused by dew, rainfall or irrigation under favorable temperatures can result in foliar disease epidemics. Conversely, hot, dry weather with minimal leaf wetness and lower humidity does not favor foliar disease infection. Under favorable periods of infection weather, using an advisory program can result in timely use of fungicides. Fungicide spray advisories will not be issued under poor infection weather periods. Timing of fungicide sprays is critical when fewer applications are used as is the case in south Texas. Use of a fungicide on an “as needed” basis can result in savings for the producer in fungicide and application costs. For example, based on one south Texas producer’s production costs, using Folicur 3.6F fungicide plus ground application cost per acre would be $20.00/acre x 200 acres = $4000.00. Fungicide application by airplane would be more expensive. Use of the AU-Pnut fungicide advisory program may offer producers, consultants, and farm managers with a useful tool in determining when to apply costly fungicides. Basic use of this program is not cost inhibitive. It involves use of a rain gauge and maintaining a record of dates of field rainfall, irrigation and fungicide applications.

MATERIALS AND METHODS

The test was conducted in an Atascosa County, south Texas grower’s field. The grower planted OLO1 peanuts on 30 June. The grower kept a record of rainfall/irrigation dates and amounts and application dates and fungicide use. Test plots were arranged in a randomized complete block with four replications including unsprayed, four spray routine and the grower AU-Pnut advisory sprayed plots. Test rows were two rows, each 20 feet long spaced 36-inches apart. Grower sprays were applied with a tractor mounted sprayer. The comparison four spray routine was applied with a small plot CO_2 pressurized sprayer.

The grower applied three sprays according to the AU-Pnut advisory. Bravo 720 (1.5 pt. /A) was applied at the initial spray at 22 days after planting. Folicur 3.6F (7.2 fl. oz. /A) was applied for the second spray at 39 days after planting. Stratego 250EC (7.0 fl. oz. /A) was applied for the final spray at 71 days after planting. The four-spray routinely applied fungicides were Bravo 720 (1.5 pt. /A) applied at 33 days after planting and Folicur 3.6F (7.2 fl. oz. /A) applied at 54, 76, and 97 days after planting. The grower followed standard practices for land preparation, fertility and weed control. Circle pivot sprinkler irrigation provided supplemental water as needed during the growing season. Assessment of leaf spot was made visually using the Florida leaf spot scale where 1= no disease, and 10= plants dead, completely defoliated from leaf spot. Soilborne disease from southern blight (*S. rolfsii)* and Rhizoctonia (*R. solani)* pod/stem rot was not a problem at this location and was not evaluated. Plots were dug at 137 days after planting, inverted and field dried. The test was combined on 21 November. Plot samples were then force air dried to 10% moisture, cleaned of debris and weighed to determine yield per acre. Pod samples were then removed for the grading procedure to determine grade and economic value. Disease ratings, yield, grade and economic value were analyzed statistically.

RESULTS AND DISCUSSION

Moderate disease pressure occurred through the growing season. As a result only three sprays by advisory were applied. There was no statistical difference in leaf spot control, yield, grade, or dollar value per acre for peanuts sprayed three times by advisory or by four routine sprays. Therefore, one spray was saved by the producer. The one extra spray received by the routinely sprayed plots resulted in numerically higher yield and dollar value per acre although these figures were not statistically significant from the advisory plots which received one less spray. A fifth routine spray was not applied due to the minimal disease pressure. Fungicide applications can increase yield and dollar value per acre but the cost of fungicide and application must not be greater than the final return of the crop. The fourth routine fungicide application basically paid for the cost of the fungicide and application and did not result in extra income for the producer. Nematodes at this test location reduced yield and plant vigor. Data from this test is presented in Table 1.

ACKNOWLEDGEMENTS

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Table 1. Fungicide Advisory Data from Atascosa County, Texas 2005.

Treatment/Program	Timing DAP [2]	Leaf spot [3] 11-08-05	Yield lb/A	Grade	$/Acre
Untreated Control	--------	5.1 a [1]	2750 b	65 b	400.29 b
4 Spray Compare Bravo 720 1.5 pt Folicur 3.6F 7.2 fl. oz.	33, 54, 76, 97	2.9 b	3388 a	69 a	557.18 a
AU-Pnut 3 Spray Bravo 720 1.5 pt Folicur 3.6F 7.2 fl. oz. Stratego 250EC 7.0 fl. oz.	22, 39, 71	3.8 ab	3176 ab	70 a	536.60 a

[1] Means in a column followed by the same letter indicate Duncan's New Multiple Range groupings of treatments that do not differ significantly (P=0.05).
[2] DAP = Days after planting.
[3] Leaf spot rating based on Florida leaf spot assessment scale (1= no

Characterization of Sclerotinia minor Populations in Texas

Charles M. Kenerley and Terry Wheeler

Introduction

Texas is the second largest producer of peanuts in the U.S. with more than 8.6 million pounds produced annually. The plant pathogen, *Sclerotinia minor*, was introduced into a small area in the western region of the state about ten years ago. An unexpected increase in the incidence of *S. minor* in commercial peanut fields in the High Plains of Texas during the 2004 growing season raised concern that the disease increase was due a more aggressive and/or a fungicide insensitive isolate. To test this hypothesis, commercial peanut fields throughout Texas were sampled to obtain isolate of *S. minor* from expanding disease foci. The isolates were characterized for their ability to attack peanut leaves, sensitivity to commonly applied fungicides and genetic variation using microsatellites.

Current Research Activities: Identifying Genotypic Variation

Microsatellites are simple sequence repeats of the nucleotides AT and GC that are located throughout the genome of the target organism. Polymerase chain reaction is employed to amplify these repeats through the use of specific primers. Microsatellites are molecular markers within the genome. These markers can be used to identify major differences among our collected isolates. Fourteen microsatellite primer sets were developed previously by Dr. Linda Kohn (University of Toronto) that amplify regions in *Sclerotinia minor* isolates from North Carolina. The primers were tested on our isolates, and we found that only eight of the primer sets were able to amplify microsatellite regions in our isolates (Table 1). We are currently genotypically characterizing each isolate using these 8 appropriate microsatellite primer sets.

Using codominant markers, such as microsatellites, will allow us to determine if the *Sclerotinia minor* isolates collected throughout Texas are clonal (arising from the same parent fungus) or unique pathogens. These markers can be used to determine if the isolates from Erath County are similar or different from the isolates from Gaines County as well as identifying if there is any difference in the pathogens within one field.

We will also use the microsatellite data to determine if there is any correlation between aggressiveness and genotypic characterization. We are attempting to determine if the most aggressive pathogens have a unique genotype. This is essential to identify because fungal population structures can rapidly shift; therefore, a pathogen in small numbers one year could be found in high numbers the next year.

We will also use these primers to determine if they will amplify regions within the late season pathogen, *Botrytis cinerea*. If these primers can not amplify *Botrytis cinerea*, these markers can be used to differentiate isolates of these pathogens. If the primers do amplify *Botrytis cinerea* genome, we will look at the overall genotypic conservation to determine if there are significant differences between the pathogens.

We have also completed internal transcribed sequence analysis, which demonstrated that *S. minor* is most closely related to *S. sclerotiorum* and *S. trifoliorum* and more distantly related to other sclerotial forming fungi, such as *Botrytis cinerea* and *Phymatotrichopsis omnivora.*

Table 1. Microsatellite Sequences

Locus	Repeat Motif	Size Range	No. of alleles
AF377900	$(GT)_8$	318-325	3
AF377911	$(TTA)_9$	345-390	5
AF377912	$(GT)_7GG(GT)_5$	268-278	4
AF377913	$(TG)_{10}$	384-388	3
AF377914	$CA_6(CGCA)_2CAT_2$	415-429	2
AF377923	$(AGAT)_{14}(AAGC)_4$	351-391	8
AF377924	$(TAC)_6C(TAC)_3$	476-488	2
AF377926	$(GTAA)_2(GCAA)(GTAA)_3$	402-422	2

Materials and Methods for Completed Studies

Isolates of *S. minor* were obtained from symptomatic peanut plants in eight production fields in Gaines (designated A, B, H, E, W, and J) Comanche (designated D), Erath (designated F, L, P, Ter1, Ter2), and Atascosa (designated U) counties during the fall of 2004 and stored as sclerotia at 4^{o}C. A detached leaflet lesion assay was conducted to test the aggressiveness of the isolates. The second leaflets of 3-week-old plants (cultivar Tamrun96) were excised, placed in a sterile glass petri dish, and inoculated with mycelial culture of the isolates. After 48 hours incubation at 20oC, the area of each leaflet and lesion were measured using ImageJ and compiled into a database (Rasban et. al 2005).

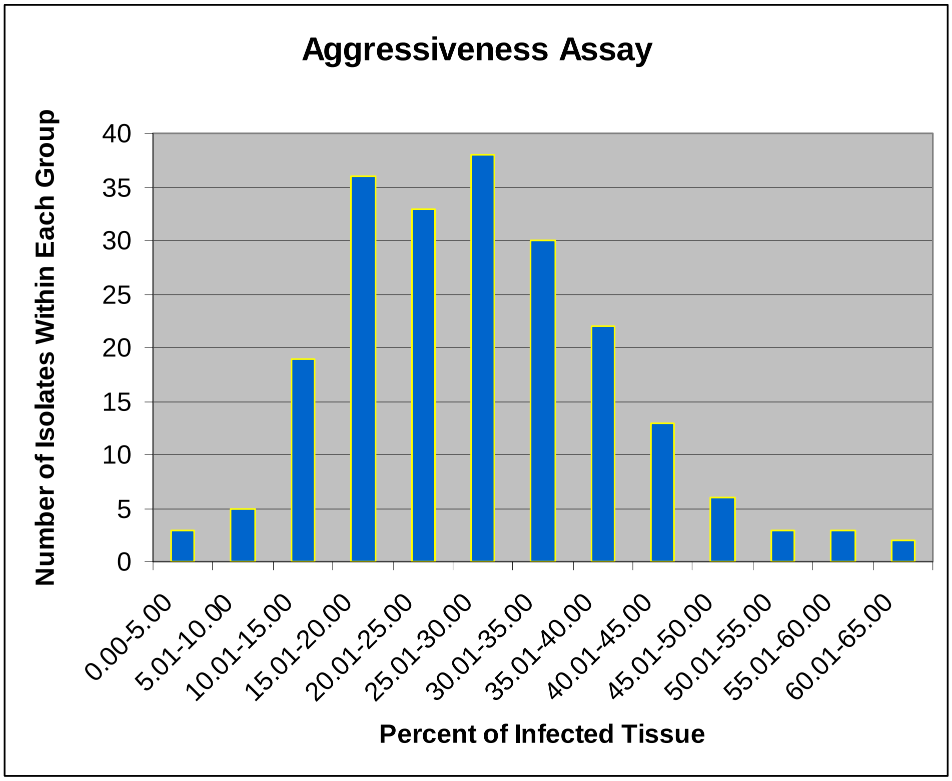
The fungicide sensitivity of the isolates to iprodione (Rovral, Rhone-Poulenc Ag Company), thiophanate-methyl (Topsin M, Cerexagri, Inc), dichloran (Botran 75W, Gowan Company), boscalid (Endura, BASF), Fluazinam (Omega 500F, Syngenta) was determined by the spiral gradient dilution method (Forster et. al 2004). The fungicides were applied onto plates using the Autoplate 4000 (Spiral Biotech, Inc). Sterile filter paper strips colonized by different isolates were then applied to each fungicide plate. The radial distance corresponding to 50% growth inhibition (as compared to the controls) was measured and used to calculate the EC50 (effective fungicide concentration at 50% inhibition). In addition to these in vitro tests, field trials were conducted in Gaines County to assay fungicide efficacy during the summer of 2005.

Results and Discussion of Detached Leaflet Assay and Fungicide Sensativity Assay

Detached Leaflet Assay.

Significant differences in aggressiveness based on lesion sized were detected among the isolates in the detached leaflet assay The majority of the isolates produced lesions that encompassed between 20-50% of the leaflet (Fig. 1). The least aggressive isolate was E1690, infecting only 2.7% of the leaflet, while the most aggressive pathogen was W125, infecting than more than 60% of the leaflet; both of these isolates were collected from Gaines County. Isolates found to produce large lesions on the detached leaflet assay were only a small portion of the total isolates recovered; therefore, this does not support the hypothesis that there was an widespread increase in a more aggressive pathogen. However, population structures have the ability to rapidly shift. Therefore, it would be very informative to re-sample the same fields this growing season to determine if the population structures have shifted or remained static.

Fig 1. Aggressiveness Assay



At this date, the aggressiveness assay has been performed on 217 isolates.

Fungicide Sensitivity

The fungicides reduced the growth of the pathogen at the levels tested; however, there was a significant difference in pathogen sensitivity (average EC50) among the fungicides. Also, there were differences in EC50s and growth patterns among isolates (Table 2). Thiophanate-methyl and dichloran are inhibitory, but they require much higher concentrations of active ingredient than fluazinam, iprodione, and boscalid to limit growth of the pathogen. Fluazinam had a lower tail ending concentration (TEC), the concentration where the isolate no longer can grow from the inoculum, than boscalid. We found that the average EC50 for fluazinam for our isolates of *S. minor* is nine times higher than the fluazinam concentration that effectively suppressing 82 to 84% of the mycelial growth of *S. minor* from Arizona (Materon et. al 2004). However, the average EC50 for boscalid was similar for both sets of isolates (Materon et. al 2004). The in vitro tests correlated to the field trial data (Table 3); both data sets found that boscalid was the most effective and topsin m was the least effective.

Table 2. In vitro Average EC50s

Fungicides	Average EC50	Range of EC50s
Thiophanate methyl	**2.59**	**0.15-8.54 µg/mL**
Dichloran	**1.12**	**0.36-2.52 µg/mL**
Iprodione	**.117**	**0.030-0.250 µg/mL**
Fluazinam	**.102**	**0.045-0.310 µg/mL**
Boscalid	**.079**	**0.020-0.177 µg/mL**

Boscalid was the most effective fungicide while Thiophanate methyl was the least effective in the in vitro and field trials.

Table 3. Field Data for the 2005 Fungicide Trials

Fungicide	Calendar-Based Application		Symptom-Based Application	
	Profit/acre ($)	*Average disease*	*Profit/acre ($)*	*Average disease*
Boscalid	724.38	11	724.25	26
Fluazinam	594.17	11	703.96	24
Thiophanate Methyl	592.26	39	519.06	40
No fungicide application	556.08	51	503.38	47

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Sclerotinia/Boytrytis Blight Control in Texas South Plains Peanut

Chip Lee, Extension Plant Pathologist, Texas Cooperative Extension - Stephenville

Summary
A field trial was conducted in Gaines County Texas to evaluate various fungicides for Sclerotinia/Boytrytis Blight control in peanut. Fungicides included: Endura, Omega, V-10116, Topsin, Abound, Botran, Bravo, and an Untreated Control (UTC). Fungicides were applied from Early August through September and varied based on treatment. Disease ratings and peanut yield, grade, and value can be seen in the following tables.

Gaines Sclerotinia/Botritis Legend

Treatment	Product	Timing	Amt/Acre
1	Endura	Early August & Late August	9 oz
2	Endura fb Omega	Early August Late August	9 oz 1.5 pt
3	V-10116 NIS	4, 5, 6, 7	0.16 .125% v v
4	V-10116 NIS	4, 5, 6, 7	.21 lb/# .125% v v
5	V-10116 NIS	4, 5, 6, 7	.250# .125% v v
6	V-10116 NIS	4, 5, 6, 7	.312 # .125% v v
7	Omega 500 NIS	Early August & Late August	1.25 pts. .125% v v
8	Topsin Abound	Early August & Late August September	1 #
9	Botran Abound	4, 5, 6, 7 September	2 #
10	Bravo Abound	Early August & Late August September	1.5 pts
11	UTC		

Runner type peanut
All values based on loan price
Planted: 5-5-05
Harvested: 10-26-05
Plot size: 2 rows X 100 X 3 ft.

2005 Sclerotinia Trial
Gaines County

Disease Rating

21-Oct-05

Treatment	Product	Rep 1	Rep 2	Rep 3	Average
1	Endura	4	3	1	**2.6**
2	Endura Omega	3	3	3	**3**
3	V-10116 - 3 grams NIS	5	4	3	**4**
4	V-10116 - 4 grams NIS	1	1	0	**0.66**
5	V-10116 - 5 grams NIS	2	1	0	**1**
6	V-10116 - 6 grams NIS	1	2	0	**1**
7	Omega NIS	1	0	0	**0.33**
8	Topsin Abound	1	2	4	**2.3**
9	Botran Abound	0	3	0	**1**
10	Bravo Abound	0	4	0	**1.3**
11	UTC	0	1	0	**0.33**

Note: Number of sclerotinia hits per plot.

Gaines Sclerotinia
2005

Treatment	Rep	Yield	% SMK + SS	% Damaged	% Inmature	Value/Ton	Value/Acre
1	1	7916	74%	1%	1%		
	2	7985	75%	1%	1%		
	3	8872	77%	0%	0%		
	Avg	8258	75%	1%	1%	$ 364.00	$ 1,501.00
2	1	7848	74%	1%	1%		
	2	7712	76%	1%	1%		
	3	7780	76%	1%	1%		
	Avg	7780	75%	1%	1%	$ 364.00	$ 1,414.00
3	1	8189	76%	0%	1%		
	2	7916	77%	1%	1%		
	3	8121	78%	0%	1%		
	Avg	8076	77%	0%	1%	$ 373.00	$ 1,507.00
4	1	7985	75%	0%	1%		
	2	7234	78%	1%	0%		
	3	8189	77%	0%	0%		
	Avg	7803	77%	0%	0%	$ 372.00	$ 1,451.00
5	1	8326	77%	1%	1%		
	2	6893	76%	1%	2%		
	3	8667	78%	0%	1%		
	Avg	7962	77%	0%	1%	$ 373.00	$ 1,486.00
6	1	7712	70%	1%	0%		
	2	7916	76%	1%	1%		
	3	7643	77%	1%	1%		
	Avg	7757	74%	1%	1%	$ 359.00	$ 1,391.00
7	1	7643	81%	0%	1%		
	2	7507	77%	0%	1%		
	3	8121	76%	0%	1%		
	Avg	7757	78%	0%	1%	$ 378.00	$ 1,466.00
8	1	7370	76%	0%	1%		
	2	8803	77%	0%	0%		
	3	8121	82%	0%	0%		
	Avg	8098	79%	0%	0%	$ 382.00	$ 1,545.00
9	1	7575	78%	1%	0%		
	2	7166	77%	1%	1%		
	3	7712	72%	0%	1%		
	Avg	7484	76%	1%	1%	$ 368.00	$ 1,379.00
10	1	8189	75%	0%	1%		
	2	7848	76%	0%	1%		
	3	8667	77%	1%	1%		
	Avg	8235	76%	0%	1%	$ 368.00	$ 1,517.00
11	1	7439	76%	1%	1%		
	2	7643	76%	0%	1%		
	3	6824	76%	1%	1%		
	Avg	7302	76%	1%	1%	$ 368.00	$ 1,345.00

Tolerance of Spanish Peanut to Soil Applied Cotton Herbicides after Crop Failure and Control of Volunteer Spanish Peanut in Cotton

Peter A. Dotray[1], Todd A. Baughman[2], J. Wayne Keeling[1], and Lyndell V. Gilbert[1]

SUMMARY

Spanish peanut is a short season peanut relative to the other market types. It is a viable option in environments with reduced heat units and is a good option in replant and recrop situations. The objective of this research was to examine peanut tolerance to herbicides applied preemergence (PRE) in cotton prior to cotton failure. Peanut was planted into the existing beds (no tillage between cotton and peanut planting) or planted into rebedded cotton ground. Cotton was planted on May 10 and the following herbicides were applied at planting: Prowl (pendimethalin), Staple (pyrithiobac), Dual Magnum (metolachlor), Caparol (prometryn), or Caparol plus Staple. The cotton was terminated using paraquat on June 1. The Spanish variety Tamspan 90 was planted on June 7. Regardless of tillage after the initial crop destruct, peanut injury following Prowl and Caparol did not exceed 10%. Peanut injury following Staple in untilled plots ranged from 52 to 72% early- to mid-season, and decreased to 18% on September 20. In plots where beds were reworked, Staple injured peanut 47 to 63% early- and mid-season, and 15% on September 20. The reduced rate of Staple plus Caparol injured peanut similar to or less than the full rate of Staple regardless of tillage between plantings (15 to 48% in the stale seedbed plots and 6 to 37% in the rebedded plots). Peanut yield in the stale seedbed plots was reduced 14% in plots treated with Staple, compared to non-treated plots which produced 3425 lb/A. No differences in yield were noted in plots that received tillage between plantings relative to the non-treated control. Peanut yield ranged from 2507 to 3111 lb/A. Results of this test indicate that Spanish peanut can be safely replanted into ground treated with Prowl, Dual Magnum, or Caparol, but not when Staple had been applied. Peanut injury was not affected by tillage.

Volunteer peanut control in cotton can be a problem, especially in years where several peanuts shatter at harvest and little/no tillage occurs between peanut harvest and cotton planting. The objective of this study was to examine of ability of Roundup WeatherMax (glyphosate) and Ignite 280 (glufosinate) applied in single and sequential applications to control ‘Tamspan 90’ Spanish peanut. Roundup WeatherMax at 32 oz/A and Ignite 280 at 29 oz/A controlled volunteer peanut at least 92% when rated 2 weeks after treatment. A sequential application of Roundup Weathermax did not improve volunteer peanut control compared to the single 32 oz/A rate. Sequential applications of Ignite 280 controlled volunteer peanut at least 99%. This control was greater than the control achieved by the single applications (82 to 96%).

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INTRODUCTION

In 2001-02, an average of 2.8 million acres were planted to cotton in the Southern High Plains 1-S district. Over this period, an average of 67% of the planted acres were harvested while the other 33% were lost to unpredictable environmental conditions such as wind, hail, and rainfall extremes. In 2003, we lost well over 1 million acres of cotton. Plant back options following cotton failure include sorghum, soybeans, guar, and peanuts, but crop tolerance to many of the soil applied cotton herbicides is unknown. In 2002, numerous questions were raised regarding the tolerance of Spanish peanut to several cotton herbicides following cotton failure. In 2003, we started investigating the tolerance of Spanish peanut following cotton failure. Previous research dating back as far as 1950 indicated that Spanish peanuts are often very sensitive to soil applied herbicides such as Treflan and Prowl. In 2003, we observed injury to Olin peanut in plots treated with Dual Magnum, Staple, and Staple plus Caparol. Injury was first apparent in the Dual Magnum plots (up to 5%), but was more apparent in the Staple-treated plots 4 and 8 weeks after planting. There was no difference in peanut injury in plots tilled (bed reformed) after crop failure compared to plots not tilled (peanuts planted directly into stale seedbeds).

MATERIALS AND METHODS

Field experiments were conducted at AG-CARES (near Lamesa) in Dawson County or at the Texas Agricultural Experiment Station (TAES) in Lubbock County in 2005. Plot sizes ranged from 2 rows by 35 or 40 feet (recrop studies at AG-CARES) or 2 rows by 30 feet (volunteer peanut control study at TAES). Herbicides were applied with a CO_2 backpack sprayer using a carrier volume of 10 gallons of water per acre. Visual crop injury was evaluated using a scale of 0 (no injury) to 100 (complete necrosis and death). For the recrop study, cotton was planted on May 10 and the following herbicides were applied at planting: Prowl, Staple, Dual Magnum, Caparol, or Caparol plus Staple. The cotton was terminated using paraquat on June 1. The Spanish variety Tamspan 90 was planted on June 7. For the volunteer peanut control study, Roundup WeatherMax or Ignite were applied at different rates, and were applied alone in a sequential combination 14 days apart. Visual control ratings were recorded 14 days after each treatment.

RESULTS AND DISCUSSION

Peanut recrop. Regardless of tillage after the initial crop destruct, peanut injury following Prowl and Caparol did not exceed 10%. Peanut injury following Staple in untilled plots ranged from 52 to 72% early- to mid-season, and decreased to 18% on September 20. In plots where beds were reworked, Staple injured peanut 47 to 63% early- and mid-season, and 15% on September 20. The reduced rate of Staple plus Caparol injured peanut similar to or less than the full rate of Staple regardless of tillage between plantings (15 to 48% in the non-tilled plots and 6 to 37% in the reworked beds). Peanut yield in the stale seedbed plots was reduced 14% in plots treated with Staple, compared to non-treated plots which produced 3425 lb/A. No differences in yield were noted in plots that received tillage between plantings relative to the non-treated control. Peanut yield ranged from 2507 to 3111 lb/A. Results of this test indicate that Spanish peanut can be safely replanted into ground treated with Prowl, Dual Magnum, or Caparol, but not when Staple had been applied. Peanut injury was not affected by tillage. (Table 1).

Cotton recrop. Regardless of tillage, cotton injury following Prowl and Caparol never exceeded 7%.   In the plots treated with Dual Magnum and not tilled between cotton plantings, replanted cotton injury ranged from 77% early-season and decreased to 27% near harvest. In Dual Magnum plots tilled between cotton plantings, replanted cotton injury ranged from 40% to 45% early- and mid-season and decreased to 18% near harvest. In plots treated with Staple and not tilled, replanted cotton was injured 17 to 40% early- to mid-season, and injury decreased to 2% near harvest. In Staple treated plots that were tilled, replanted cotton injury ranged from 22 to 40% early- and mid-season, and decreased to 2% late-season (2%). Similar injury was observed following Staple and not tilled between plantings. Reducing the rate of Staple and adding Caparol decreased cotton injury compared to the full rate of Staple alone, but injury was still apparent in the untilled (up to 22%) and tilled (up to 30%) plots. Cotton lint yields following Dual Magnum, Staple, and Staple plus Caparol in the non-tilled recrop plots were reduced relative to the non-treated control (which yielded 1130 lb/A). Similarly, in the plots tilled between cotton plantings, Dual Magnum, Staple, and Staple plus Caparol reduced cotton yield relative to the non-treated control (which yielded 1048 lb/A). Dual Magnum was the most injurious to replanted cotton following cotton regardless of tillage. (Table 2).

Volunteer peanut control. Volunteer peanut control in cotton can be a problem, especially in years where several peanuts shatter at harvest and little/no tillage occurs between peanut harvest and cotton planting. Preplant tillage and in-season cultivations are effective, but are not options if conservation tillage systems (reduced or no-till) are used. Previous research indicated the herbicides applied preemergence at cotton planting had poor activity at controlling volunteer peanut. Additional research suggested that few postemergence-topical herbicides were effective in cotton. The objective of this study was to examine of ability of Roundup WeatherMax (glyphosate) and Ignite 280 (glufosinate) applied in single and sequential applications to control 'Tamspan 90' Spanish peanut. At 2 weeks after treatment (WAT), Roundup WeatherMax at 32 ounces controlled peanut 92%, which was more effective than the 22 oz/A rate (85%) (Table 3). A similar trend was observed for Ignite 280. Ignite 280 at 29 oz/A controlled volunteer peanut 94%, which was greater than the control achieved at 23 oz/A (83%). On August 8 (2 weeks after the sequential applications were applied), Roundup WeatherMax at 32 oz/A followed by (fb) Roundup WeatherMax at 32 or 22 oz/A controlled volunteer peanut 96 to 98%. This control was more effective than Roundup Weathermax at 22 oz/A fb 22 oz/A and Roundup WeatherMax at 22 oz/A in a single application. However, the single application of Roundup WeatherMax at 32 oz/A provided similar control (95%) compared to the 32 oz/A fb 32 oz/A and 32 oz/A fb 22 oz/A sequential applications. Sequential applications of Ignite 280 controlled volunteer peanut at least 99%. A single application of Ignite 280 at 29 oz/A controlled peanut 96%. Less effective volunteer peanut control was observed following Ignite 280 at 23 oz/A (82%). These results suggest that the higher rates of Roundup Weathermax (32 oz/A) and Ignite 280 (29 oz/A) were more effective at controlling volunteer peanut and the sequential Roundup WeatherMax applications did not improve control when compared to single applications (Table 3).

Table 1. Peanut recrop tolerance and yield following cotton herbicides applied preemergence before crop failure at AG-CARES, Lamesa TX in 2005.

Treatment	Tillage after crop destruct	Rate lb/A	Rate (Prod/A)	Peanut Injury (%)				Yield (lb/A)
				Jun 20	Jul 5	Aug 2	Sep 20	
Untreated	none	—	---	0	0	0	0	3425
Prowl 3.3 EC	none	0.5	1.2 pt	0	0	3	0	3649
Staple 85 WP	none	0.063	1.2 oz	52	72	53	18	2944
Dual Magnum 7.62 EC	none	1.0	1 pt	3	7	10	0	3895
Caparol 4 L	none	0.8	1.6 pt	0	0	10	0	3940
Caparol + Staple	none	0.8 + 0.032	1.6 pt + 0.6 oz	28	48	37	15	3492
CV				35	45	66	65	8
LSD $_{(0.10)}$				7	14	18	5	397
Untreated	yes	---	---	0	0	0	0	3111
Prowl 3.3 EC	yes	0.5	1.2 pt	0	0	7	0	2820
Staple 85 WP	yes	0.063	1.2 oz	47	63	47	15	2507
Dual Magnum 7.62 EC	yes	1.0	1 pt	7	2	3	5	2451
Caparol 4 L	yes	0.8	1.6 pt	0	0	8	0	3111
Caparol + Staple	yes	0.8 + 0.032	1.6 pt + 0.6 oz	23	37	17	6	2518
CV				28	38	59	58	21
LSD $_{(0.10)}$				5	10	12	4	NS

Table 2. Cotton recrop tolerance and yield following herbicides applied preemergence before crop failure at AG-CARES, Lamesa TX in 2005.

Treatment	Tillage after crop destruct	Rate (lb/A)	Rate (prod./A)	Cotton Injury (%)				Yield (lb/A)
				Jun 20	Jul 5	Aug 2	Sep 20	
Untreated	none	---	---	0	0	0	0	1130
Prowl 3.3 EC	none	0.5	1.2 pt	0	0	0	0	1091
Staple 85 WP	none	0.063	1.2 oz	22	40	17	2	920
Dual Magnum 7.62 EC	none	1.0	1 pt	77	68	50	27	591
Caparol 4L	none	0.8	1.6 pt	0	0	0	0	1091
Caparol + Staple	none	0.8 + 0.032	1.6 pt + 0.6 oz	12	22	13	2	939
CV				16	39	39	41	8
LSD $_{(0.10)}$				5	13	8	3	116
Untreated	yes	---	---	0	0	0	0	1048
Prowl 3.3 EC	yes	0.5	1.2 pt	0	0	0	0	1023
Staple 85 WP	yes	0.063	1.2 oz	27	40	22	2	818
Dual Magnum 7.62 EC	yes	1.0	1 pt	47	48	40	18	723
Caparol 4L	yes	0.8	1.6 pt	0	0	0	0	1045
Caparol + Staple	yes	0.8 + 0.032	1.6 pt + 0.6 oz	5	30	18	5	942
CV				66	27	54	69	6
LSD $_{(0.10)}$				13	8	13	4	85

Table 3. Spanish peanut control as affected by early- (EP) and mid- postemergence (MP) herbicide applications.

Treatment	Timing	Rate (lb ai/A)	Rate (oz./A)	Volunteer Peanut Control (%)	
				Jul 25	Aug 8
Non-treated	---	---	---	0	0
Roundup WeatherMax	EP	0.75	22	85	80
Roundup WeatherMax	EP	1.125	32	92	95
Roundup WeatherMax fb Roundup WeatherMax	EP fb MP	0.75 fb 0.75	22 fb 22	---	86
Roundup WeatherMax fb Roundup WeatherMax	EP fb MP	1.125 fb 1.125	32 fb 32	---	98
Roundup WeatherMax fb Roundup WeatherMax	EP fb MP	1.125 fb 0.75	32 fb 22	---	96
Ignite 280	EP	0.42	23	83	82
Ignite 280	EP	0.52	29	94	96
Ignite 280 fb Ignite 280	EP fb MP	0.42 fb 0.42	23 fb 23	---	100
Ignite 280 fb Ignite 280	EP fb MP	0.52 fb 0.52	29 fb 29	---	100
Ignite 280 fb Ignite 280	EP fb MP	0.52 fb 0.42	29 fb 23	---	99
CV				4	3
$LSD_{(0.10)}$				5	3

Peanut Tolerance to Aim and ET

Peter A. Dotray[1], Todd Baughman[2], James Grichar[3], Wayne Keeling[1], Lyndell Gilbert[1]

SUMMARY

Field experiments were conducted in 2004 and 2005 to gain experience with Aim and ET applied postemergence in peanut at different application timings. Visual injury ranged from 47 to 62% following Aim treatments and 35 to 40% following ET treatments applied early-postemergence (EP) at AG-CARES in 2004. Injury decreased over time but was still apparent at harvest (2 to 7%). Visual injury following late-postemergence (LP) treatments did not exceed 5%. Yield loss was observed following Aim (2 oz) and ET (1.5 and 2 oz) applied EP and ET (2 oz) applied LP. At WPGRF in 2004, visual injury was observed following Aim and ET applied 30 days after planting (DAP). This injury ranged from 22 to 47% following Aim treatments and 33 to 48% following ET treatments 14 days after treatment (DAT). All injury decreased over time, but was still apparent at harvest (2 to 3%). Visual injury from applications made at 120 DAP did not exceed 7%. Peanut yield was not reduced following any herbicide treatment at this location. At Rochestor in 2004, Aim and ET (2 oz) applied EP injured peanut 23 to 25%, but injury decreased to less than 5% at the end of the season. Aim and ET applied LP caused up to 20% injury 19 DAT. Peanut yield loss was observed following Aim at 2 oz EP. At Yoakum in 2004, visual injury was observed following Aim and ET applied EP regardless of rate. ET at 2 oz produced the lowest yield. At a second location South Texas, Aim and ET applied 35 DAP caused more injury (14 to 20%) than applications made at 97 DAP (4 to 8%). No differences in yield were noted between herbicide treatments at this location. At AG-CARES in 2005, injury ranged from 17 to 30% following Aim treatments and 27 to 38% following ET treatments 14 days after EP applications. All peanut injury decreased over time, but was still visible at harvest (2 to 6%). Visual injury following Aim and ET applied LP ranged from 9 to 13% and 12 to 16%, respectively. Peanut yield and grade were not affected by herbicide or application timing. At Lockett in 2005, peanut injury did not exceed 7% regardless of herbicide, rate, or time of application. Peanut yield and grade were not different from the untreated control. At Lamesa in 2005, ivyleaf morningglory was controlled at least 88% by Aim (1.0, 1.5, and 2.0 oz) and ET (1.5 and 2.0 oz) when applications were made at-crack (AC). In general, control decreased when applications were delayed, especially at 56 days after crack (DAC). Peanut injury was less than 5% and 14% in 2004 and 2005, respectively, when applications were made AC. Injury increased to as much as 60% when applications were delayed to 28 DAC. Peanut yield decreased as weed control decreased. At Yoakum in 2005, at-crack applications of Aim controlled Palmer amaranth and horse purslane 100%, but control of southern crabgrass was ineffective (10 to 22%). ET was less effective at controlling Palmer amaranth (92 to 98%) and smellmelon (93 to 96%) two days after treatment. Herbicide treatments made at 28 DAC were not as effective as the control following the AC treatments. Aim controlled Palmer amaranth 47 to 63% and southern crabgrass 0 to 20%, while ET controlled these same weeds 26 to 45% and 0 to 27%, respectively. Regardless of herbicide and rate, applications made 56 DAC were ineffective at controlling Palmer amaranth (0 to 63%) and southern crabgrass (0%).

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INTRODUCTION

In 2004, Spartan 4F (sulfentrazone) was labeled for use in the southeast (Alabama, Georgia, North Carolina, South Carolina, Virginia, and Mississippi) after several years of testing. Research from South and West Texas indicated that this herbicide injured peanut 50 to 80% (Grichar et al. 2006). FMC received a federal label for this product, but the label excludes states like Texas where significant injury has been observed. Aim (carfentrazone-ethyl) may be applied to the row middles of emerged peanut. Both sulfentrazone and carfentrazone belong in the PPO family of herbicides. Until 2004, little university data (Georgia and South Texas) had been collected on the use of Aim postemergence-topical in peanut. ET (pyraflufen-ethyl), which is manufactured by Nichino America, Inc., is another PPO inhibitor that is being tested for selectivity in peanut. Field experiments were conducted in 2004 and 2005 to gain experience with Aim and ET applied postemergence in peanut at different application timings.

MATERIALS AND METHODS

Field studies were conducted in 2004 and 2005 in West Texas (at AG-CARES near Lamesa and Western Peanut Growers Research Farm (WPGRF) near Denver City), in South Texas (Yoakum), and in the Rolling Plains (Rochestor and Lockett). In peanut tolerance studies, Aim at 0.024 and 0.032 lb ai/A and ET at 0.00234 and 0.00313 lb ai/A (1.5 and 2.0 ounces of product per acre) were applied early-postemergence (EP, 30 to 50 days after planting (DAP)) and late-postemergence (LP, approximately 90 to 120 DAP). Peanut injury was evaluated after each application and yield and grade determined at the end of the growing season. In order to ensure that plant injury and yield/quality loss was the result of a herbicide treatment, plots were maintained weed-free. Additional studies were conducted in West and South Texas to determine peanut response and weed control following Aim and ET applications made at-crack (AC), 28 days after ground crack (28 DAC), and 56 DAC. Weed control was evaluated on various weed species and peanut injury was evaluated throughout the growing season.

2005 RESULTS AND DISCUSSION

West Texas. At AG-CARES in 2005, injury ranged from 17 to 30% following Aim treatments and 27 to 38% following ET treatments 14 days after EP applications (Table 1). All peanut injury decreased over time, but was still visible at harvest (2 to 6%). Visual injury following Aim and ET applied LP ranged from 9 to 13% and 12 to 16%, respectively. Peanut yield and grade was not affected by herbicide or application timing (Table 1). At Lockett in 2005, peanut injury did not exceed 7% regardless of herbicide, rate, or time of application (Table 2). Peanut yield and grade were not different from the untreated control. Ivyleaf morningglory was controlled at least 88% by Aim (1.0, 1.5, and 2.0 oz) and ET (1.5 and 2.0 oz) when applications were made AC (Table 4). In general, control decreased when applications were delayed, especially at 56 DAC. Peanut injury was less than 14% when applications were made AC (Table 3). Injury increased to as much as 60% when applications were delayed to 28 DAC. Peanut yield decreased as weed control decreased (Table 5). Tall waterhemp was controlled 83 to 93%, 98 to 100%, and 82 to 94% following Aim and ET applied AC, 28 DAC, and 56 DAC, respectively. Poor control of broadleaf signalgrass (up to 13%) was observed regardless of herbicide, rate, and application timing.

South Texas. At 2 days after the at-crack (AC) treatment, peanut was injured 23 to 40% and 12 to 25% following Aim and ET, respectively (Table 6). Aim at 2.0 oz/A injured peanut 40%, which was similar to the injury caused by Gramoxone Max plus Basagran. Two weeks after the AC applications, no treatment caused over 4% peanut injury. AC applications of Aim effectively controlled Palmer amaranth (99 to 100%), smellmelon (98 to 100%), and horse purslane (100%) 2 days after treatment (DAT). Two weeks after the AC applications, Aim controlled Palmer amaranth and horse purslane 100%, but control of southern crabgrass was ineffective (10 to 22%). ET was less effective at controlling Palmer amaranth (92 to 98%), smellmelon (93 to 96%), southern crabgrass (27 to 67%) and horse purslane (89 to 98%) at 2 DAT. Control of Palmer amaranth (100%) and horse purslane (100%) by ET was similar to Aim, but ET was less effective than Aim at controlling southern crabgrass (0 to 10%) at 2 weeks after treatment (WAT). In general, Aim was more similar to Gramoxone Max plus Basagran compared to ET.

At four to five weeks after the AC treatments were applied, Aim controlled Palmer amaranth and smellmelon 100%, but poor control of southern crabgrass was observed (5 to 10%). At this same observation period, ET controlled Palmer amaranth 98 to 100%, smellmelon 88 to 93%, and southern crabgrass 0 to 7%. Herbicide treatments made at 28 DAC were not as effective as the control following the AC treatments. Aim controlled Palmer amaranth 47 to 63% and southern crabgrass 0 to 20%, while ET controlled these same weeds 26 to 45% and 0 to 27%, respectively. Regardless of herbicide and rate, applications made 56 DAC were ineffective at controlling Palmer amaranth (0 to 63%) and southern crabgrass (0%). Control of smellmelon following Aim (67 to 99%) and ET (97 to 100%) applied 28 DAC was as effective as applications made AC.

Table 1. Peanut injury and yield as affected by AIM and ET applied early- (EP) and late-postemergence (LP) at AG-CARES in 2005.

Treatment	Timing	Rate (lb ai/A)	Rate (oz/A)	Peanut Injury (%)					Yield (lb/A)	Grade (%)
				Jun 29	Jul 15	Aug 10	Sep 6	Sep 20		
Non-treated	—	---	---	0	0	0	0	0	4255	69
AIM + COC	EP	0.024 + 1%	1.5	17	20	7	6	4	4780	70
AIM + COC	EP	0.032 + 1%	2.0	30	31	12	7	5	4736	70
ET + COC	EP	0.00234 + 0.5%	1.5	27	31	10	6	2	4119	69
ET + COC	EP	0.00313 + 0.5%	2.0	38	38	13	10	6	4434	68
Gramoxone Max + Basagran + NIS	EP	0.1875 + 0.25 + 0.25%	8 + 8	10	23	6	5	0	4660	70
AIM + COC	LP	0.024 + 1%	1.5	--	--	--	9	0	4599	69
AIM + COC	LP	0.032 + 1%	2.0	--	--	--	13	3	3999	68
ET + COC	LP	0.00234 + 0.5%	1.5	--	--	--	12	0	4344	69
ET + COC	LP	0.00313 + 0.5%	2.0	--	--	--	16	5	4104	69
2,4-DB + COC	LP	0.40 + 1%	25.6	--	--	--	7	0	3864	68
CV									11	2
LSD $_{(0.10)}$				4	2	2	2	2	NS	NS

Table 2. Peanut injury and yield as affected by AIM and ET applied early- (POST 1) and late-postemergence (POST 2) at Lockett in 2005.

Treatment	Timing	Rate (oz/A)	Peanut Injury (%)					Yield (lb/A)	Grade (%)
			Jul 8	Jul 25	Aug 8	Sep 12	Sep 22		
AIM + Agridex	POST 1	1.5 + 1 %	3	2	2	2	0	6895	77
AIM + Agridex	POST 2	1.5 + 1 %	0	0	0	0	8	5952	76
AIM + Agridex	POST 1	2 + 1 %	7	3	0	0	0	5986	77
AIM + Agridex	POST 2	2 + 1 %	0	0	0	0	12	5996	76
ET + Agridex	POST 1	1.5 + 0.5 %	5	0	2	2	0	5366*	77
ET + Agridex	POST 2	1.5 + 0.5 %	0	0	0	0	7	5591	75
ET + Agridex	POST 1	2 + 0.5 %	3	2	2	2	2	6487	75
ET + Agridex	POST 2	2 + 0.5 %	0	0	0	0	2	5548	75
Gramoxone + Basagran + Induce	POST 1	8 + 8 + 0.25%	0	0	0	0	0	6422	75
2, 4-DB + Agridex	POST 2	1.6 pt/A + 1%	0	0	0	0	0	6083	75
Untreated	---	---	0	0	0	0	0	5490	76
CV								19	2
LSD $_{(0.10)}$			3	NS	NS	NS	6	NS	NS

*yield is less than the non-treated control based on p≤0.10.

Table 3. Peanut injury, as affected by AIM and ET applied at-crack, mid-postemergence, and late-postemergence.

Treatment	Timing	Rate (lb ai/A)	Rate (oz/A)	Peanut Injury (%)						
				Jun 9	Jun 21	Jul 5	Jul 19	Aug 2	Aug 16	Sep 13
Non-treated	---	---	---	0	0	0	0	0	0	0
AIM + COC	AC	0.008 + 1%	0.5	4	0	3	3	7	0	0
AIM + COC	AC	0.016 + 1%	1.0	7	8	9	5	8	0	3
AIM + COC	AC	0.024 + 1%	1.5	13	20	12	6	5	7	8
AIM + COC	AC	0.032 + 1%	2.0	14	25	10	9	8	10	12
ET + COC	AC	0.00078 + 0.5%	0.5	2	0	2	7	8	0	0
ET + COC	AC	0.00156 + 0.5%	1.0	9	8	6	6	8	0	0
ET + COC	AC	0.00234 + 0.5%	1.5	10	7	5	6	8	0	3
ET + COC	AC	0.00313 + 0.5%	2.0	12	10	6	9	8	2	12
Gramoxone Max + Basagran + NIS	AC	0.25 + 0.25 + 0.25%	10.6 + 8	6	3	4	7	7	7	5
AIM + COC	28 DAC	0.008 + 1%	0.5	0	0	10	12	8	23	18
AIM + COC	28 DAC	0.016 + 1%	1.0	0	0	14	18	10	32	25
AIM + COC	28 DAC	0.024 + 1%	1.5	0	0	27	27	15	33	27
AIM + COC	28 DAC	0.032 + 1%	2.0	0	0	32	32	15	13	17
ET + COC	28 DAC	0.00078 + 0.5%	0.5	0	0	10	15	17	27	27
ET + COC	28 DAC	0.00156 + 0.5%	1.0	0	0	23	22	13	33	32
ET + COC	28 DAC	0.00234 + 0.5%	1.5	0	0	24	25	17	33	33
ET + COC	28 DAC	0.00313 + 0.5%	2.0	0	0	38	37	15	27	27
Gramoxone Max + Basagran + NIS	28 DAC	0.25 + 0.25 + 0.25%	10.6 + 8	0	0	25	25	12	27	27
AIM + COC	56 DAC	0.008 + 1%	0.5	0	0	0	0	13	45	43
AIM + COC	56 DAC	0.016 + 1%	1.0	0	0	0	0	12	47	47
AIM + COC	56 DAC	0.024 + 1%	1.5	0	0	0	0	13	40	42
AIM + COC	56 DAC	0.032 + 1%	2.0	0	0	0	0	7	33	38
ET + COC	56 DAC	0.00078 + 0.5%	0.5	0	0	0	0	8	47	37
ET + COC	56 DAC	0.00156 + 0.5%	1.0	0	0	0	0	13	40	40
ET + COC	56 DAC	0.00234 + 0.5%	1.5	0	0	0	0	12	40	40
ET + COC	56 DAC	0.00313 + 0.5%	2.0	0	0	0	0	15	40	42
2,4-DB + COC	56 DAC	0.40 + 1%	25.6	0	0	0	0	5	43	33
LSD $_{(0.10)}$				2	2	5	3	NS	6	8

Table 4. Weed control, as affected by AIM and ET applied at-crack, mid-postemergence, and late-postemergence.

Treatment	Timing	Rate (lb ai/A)	Rate (oz/A)	Ivyleaf Morningglory Control (%)						
				Jun 9	Jun 21	Jul 5	Jul 19	Aug 2	Aug 16	Sep 13
Non-treated	---	---	---	0	0	0	0	0	0	0
AIM + COC	AC	0.008 + 1%	0.5	79	75	96	97	96	85	88
AIM + COC	AC	0.016 + 1%	1.0	88	78	96	98	93	87	90
AIM + COC	AC	0.024 + 1%	1.5	88	83	92	96	84	80	78
AIM + COC	AC	0.032 + 1%	2.0	90	84	96	97	92	78	78
ET + COC	AC	0.00078 + 0.5%	0.5	70	65	93	95	93	82	82
ET + COC	AC	0.00156 + 0.5%	1.0	87	75	98	98	93	83	88
ET + COC	AC	0.00234 + 0.5%	1.5	90	90	98	98	95	91	91
ET + COC	AC	0.00313 + 0.5%	2.0	88	85	95	98	92	85	88
Gramoxone Max + Basagran + NIS	AC	0.25 + 0.25 + 0.25%	10.6+ 8	78	78	96	98	95	91	88
AIM + COC	28 DAC	0.008 + 1%	0.5	0	0	77	78	73	73	77
AIM + COC	28 DAC	0.016 + 1%	1.0	0	0	77	57	72	78	79
AIM + COC	28 DAC	0.024 + 1%	1.5	0	0	81	58	73	82	84
AIM + COC	28 DAC	0.032 + 1%	2.0	0	0	88	71	83	90	88
ET + COC	28 DAC	0.00078 + 0.5%	0.5	0	0	52	42	45	73	81
ET + COC	28 DAC	0.00156 + 0.5%	1.0	0	0	68	32	63	78	83
ET + COC	28 DAC	0.00234 + 0.5%	1.5	0	0	63	32	62	80	85
ET + COC	28 DAC	0.00313 + 0.5%	2.0	0	0	82	60	82	88	90
Gramoxone Max + Basagran + NIS	28 DAC	0.25 + 0.25 + 0.25%	10.6 + 8	0	0	78	66	75	70	73
AIM + COC	56 DAC	0.008 + 1%	0.5	0	0	0	18	30	32	42
AIM + COC	56 DAC	0.016 + 1%	1.0	0	0	0	0	13	32	35
AIM + COC	56 DAC	0.024 + 1%	1.5	0	0	0	0	37	53	53
AIM + COC	56 DAC	0.032 + 1%	2.0	0	0	0	0	35	60	60
ET + COC	56 DAC	0.00078 + 0.5%	0.5	0	0	0	0	50	22	35
ET + COC	56 DAC	0.00156 + 0.5%	1.0	0	0	0	0	54	40	50
ET + COC	56 DAC	0.00234 + 0.5%	1.5	0	0	0	0	43	40	43
ET + COC	56 DAC	0.00313 + 0.5%	2.0	0	0	0	0	23	65	60
2,4-DB + COC	56 DAC	0.40 + 1%	25.6	0	0	0	0	57	96	95
LSD $_{(0.10)}$				3	4	10	19	28	10	15

Table 5. Peanut yield and grade, as affected by AIM and ET applied at-crack, mid-postemergence, and late-postemergence.

Treatment	Timing	Rate (lb ai/A)	Rate (oz/A)	Yield (lb/A)	Grade (%)
Non-treated	---	---	---	3066	70
AIM + COC	AC	0.008 + 1%	0.5	3634	71
AIM + COC	AC	0.016 + 1%	1.0	3348	73
AIM + COC	AC	0.024 + 1%	1.5	2580*	72
AIM + COC	AC	0.032 + 1%	2.0	2823*	71
ET + COC	AC	0.00078 + 0.5%	0.5	2519*	72
ET + COC	AC	0.00156 + 0.5%	1.0	2386*	72
ET + COC	AC	0.00234 + 0.5%	1.5	3340	73
ET + COC	AC	0.00313 + 0.5%	2.0	2871*	72
Gramoxone Max + Basagran + NIS	AC	0.25 + 0.25 + 0.25%	10.6 + 8	3182	72
AIM + COC	28 DAC	0.008 + 1%	0.5	2938*	70
AIM + COC	28 DAC	0.016 + 1%	1.0	1280*	72
AIM + COC	28 DAC	0.024 + 1%	1.5	2275*	69
AIM + COC	28 DAC	0.032 + 1%	2.0	2194*	71
ET + COC	28 DAC	0.00078 + 0.5%	0.5	2360*	70
ET + COC	28 DAC	0.00156 + 0.5%	1.0	2461*	70
ET + COC	28 DAC	0.00234 + 0.5%	1.5	2259*	70
ET + COC	28 DAC	0.00313 + 0.5%	2.0	2459*	71
Gramoxone Max + Basagran + NIS	28 DAC	0.25 + 0.25 + 0.25%	10.6 + 8	1915*	71
AIM + COC	56 DAC	0.008 + 1%	0.5	1111*	70
AIM + COC	56 DAC	0.016 + 1%	1.0	1533*	69
AIM + COC	56 DAC	0.024 + 1%	1.5	958*	71
AIM + COC	56 DAC	0.032 + 1%	2.0	1559*	69
ET + COC	56 DAC	0.00078 + 0.5%	0.5	1958*	71
ET + COC	56 DAC	0.00156 + 0.5%	1.0	1618*	69
ET + COC	56 DAC	0.00234 + 0.5%	1.5	1433*	70
ET + COC	56 DAC	0.00313 + 0.5%	2.0	1684*	70
2,4-DB + COC	56 DAC	0.40 + 1%	25.6	1852*	70
CV				38	3
$LSD_{(0.10)}$				1175	NS

*yield is less than the non-treated control based on $p \leq 0.10$.

Table 6. Peanut injury and weed control as affected by AIM and ET applied at-crack, mid-postemergence, and late-postemergence[a].

Treatment	Timing	Rate (lb ai/A)	Rate (oz/A)	Peanut (%) Injury 2 DAT	AMAPA (%) Control 2 DAT	CUMME (%) Control 2 DAT	DIGSP (%) Control 2 DAT	TRTPO (%) Control 2 DAT	Peanut (%) Injury 2 WAT	AMAPA (%) Control 2 WAT	DIGSP (%) Control 2 WAT	TRTPO (%) Control 2 WAT	AMAPA (%) Control 4-5 WAT	CUMME (%) Control 4-5 WAT	DIGSP (%) Control 4-5 WAT
Non-treated	---	---	---	0	0	0	0	0	0	0	0	0	0	0	0
AIM + COC	AC	0.008 + 1%	0.5	23	99	100	33	100	2	100	10	100	100	100	5
AIM + COC	AC	0.016 + 1%	1.0	28	99	98	47	100	2	100	13	100	100	100	7
AIM + COC	AC	0.024 + 1%	1.5	33	100	100	60	100	1	100	22	100	100	100	10
AIM + COC	AC	0.032 + 1%	2.0	40	100	100	78	100	2	100	20	100	100	100	10
ET + COC	AC	0.00078 + 1%	0.5	12	95	93	37	89	1	100	10	100	100	93	3
ET + COC	AC	0.00156 + 1%	1.0	20	93	96	27	98	4	100	5	100	98	88	7
ET + COC	AC	0.00234 + 1%	1.5	28	98	93	65	97	2	100	0	100	100	99	3
ET + COC	AC	0.00313 + 1%	2.0	25	92	95	67	98	2	100	7	100	98	90	0
Gramoxone Max + Basagran + NIS	AC	0.375 + 0.25 + 0.25%	16 + 8	40	100	100	100	100	3	99	99	99	97	100	98
AIM + COC	28 DAC	0.008 + 1%	0.5	---	---	---	---	---	---	---	---	---	52	---	0
AIM + COC	28 DAC	0.016 + 1%	1.0	---	---	---	---	---	---	---	---	---	63	---	13
AIM + COC	28 DAC	0.024 + 1%	1.5	---	---	---	---	---	---	---	---	---	53	---	0
AIM + COC	28 DAC	0.032 + 1%	2.0	---	---	---	---	---	---	---	---	---	47	---	20
ET + COC	28 DAC	0.00078 + 1%	0.5	---	---	---	---	---	---	---	---	---	27	---	0
ET + COC	28 DAC	0.00156 + 1%	1.0	---	---	---	---	---	---	---	---	---	45	---	27
ET + COC	28 DAC	0.00234 + 1%	1.5	---	---	---	---	---	---	---	---	---	52	---	13
ET + COC	28 DAC	0.00313 + 1%	2.0	---	---	---	---	---	---	---	---	---	26	---	3
Gramoxone Max + Basagran + NIS	28 DAC	0.375 + 0.25 + 0.25%	16 + 8	---	---	---	---	---	---	---	---	---	73	---	37
AIM + COC	56 DAC	0.008 + 1%	0.5	---	---	---	---	---	---	---	---	---	0	99	0
AIM + COC	56 DAC	0.016 + 1%	1.0	---	---	---	---	---	---	---	---	---	33	98	0
AIM + COC	56 DAC	0.024 + 1%	1.5	---	---	---	---	---	---	---	---	---	57	87	0
AIM + COC	56 DAC	0.032 + 1%	2.0	---	---	---	---	---	---	---	---	---	63	67	0
ET + COC	56 DAC	0.00078 + 1%	0.5	---	---	---	---	---	---	---	---	---	27	100	0
ET + COC	56 DAC	0.00156 + 1%	1.0	---	---	---	---	---	---	---	---	---	58	100	0
ET + COC	56 DAC	0.00234 + 1%	1.5	---	---	---	---	---	---	---	---	---	40	100	0
ET + COC	56 DAC	0.00313 + 1%	2.0	---	---	---	---	---	---	---	---	---	7	97	0
2,4-DB + COC	56 DAC	0.40 + 1%	25.6	---	---	---	---	---	---	---	---	---	37	43	0
LSD $_{(0.05)}$				6	5	5	12	4	2	0	10	0			

[a]Abbreviations: AMAPA, *Amaranthus palmeri* (Palmer amaranth); CUMME, *Cucumis melo* (smellmelon); DIGSP, *Digitaria ciliaris* (southern crabgrass); TRTPO, *Trianthema portulacastrum* (horse purslane).

Evaluation of Foliar Fertilizer and other Additives on Peanut Crop Response and Economic Returns

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Introduction

Producers annually apply various combinations of yield enhancing agents including foliar fertilizers and other plant growth regulators in the hopes of improving plant growth and performance. The products often include the addition of a micronutrient (especially iron). Iron chlorosis is commonly observed across the peanut growing region of Texas. Growers will often apply a foliar fertilizer containing iron and in many cases other micronutrients. In addition, plant growth regulators may be applied to boost early season plant vigor and growth. While these applications may temporarily improve plant growth and/or appearance they may not benefit peanut yield or quality. Many of these products have never been tested in a replicated experiment by an unbiased representative, especially over multiple years and locations. Therefore, there is little or no data to determine if the products actually improve a producer's bottom line. As peanut profitability continues to tighten it is imperative that each input applied by a producer provides an economical return. Location and environment will most likely effect the performance of these products. Therefore the goal of this project through multiple year and location testing is to determine when and where these products might be most economically and effectively applied.

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Discussion

Field studies were conducted in Dawson (AG-CARES), Lamb (2 locations), Terry, and Wilbarger counties. Twelve treatments were applied at each location: untreated (no foliar product, Peanut Gro 4-2-1 at 1 qt pr/A POST3, CoRoN at 3 gal pr /A POST2, Elemax Nutrient Concentrate at 1 qt pr/A + CoRoN at 1 gal pr/A POST2, Tracite Iron 5% 1 qt pr/A POST3, Cotton & Peanut Mix 1 gal pr/A POST3, Quick Boost Ultra at 1 gal pr/A POST3, Humic Acid at 1 gal pr/A POST10, Fulvic Acid at 1 gal pr/A POST10, Liquid Chicken at 1 gal pr/A POST10, Humic Acid at 0.6 gal pr/A POST10 + Fulvic Acid at 0.1 gal pr/A POST10 + Liquid Chicken at 0.3 gal pr/A POST10, Humic Acid at 1 gal pr/A + Foliar (varied by location). The foliar product at AG-CARES and Wilbarger was Elemax Nutrient Concentrate at 1 qt pr/A + CoRoN at 1 gal pr/A POST2, at Lamb-1 was Peanut Gro 4-2-1 at 1 qt pr/A POST3, at Lamb-2 was Tracite Iron 5% 1 qt pr/A POST3, and at Terry was Cotton & Peanut Mix 1 gal pr/A POST3. The exception to this list was that Tracite Iron 5% and Quick Boost Ultra were not applied at the Wilbarger location. The following spray regime was used: the first treatment was applied starting in the middle of June (corresponding with early bloom). POST2 applications would have received 2 applications, POST3 applications would have received 3 applications, and POST10 applications would have received 10 applications. Follow up applications were applied on a 7 to 10 day schedule after the initial application applied in mid-June. All treatments were applied broadcast in 15 gallons per acre water carrier. All treatments were applied with a 0.25 % v/v non-ionic surfactant except Humic Acid, Fulvic Acid, and Liquid Chicken. No treatment applied affected yields or grades at any location when compared to where no foliar product was applied. Sound mature kernels and sound splits were also not effected. None of the foliar products affected extra large kernels at the Virginia market-type location either.

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Texas A&M Research & Extension

Foliar Product Evaluation Trials - 2005

Treatment	Rate	Timing	AG-Cares	Lamb-1	Lamb-2	Terry	Wilbarger
					Yield		
			------------------	------------------	(lb/A)	------------------	------------------
Untreated			4825	4211	3469	1373	6496
Peanut Gro 4-2-1	1 qt/A	POST3	4558	4175	3267	1114	6774
CoRoN	3 gal/A	POST2	4935	3630	3509	1668	6141
Elemax Nutrient Conc	1 qt/A	POST2	4599	3775	3469	1163	6387
CoRon	1 gal/A						
Tracite Iron 5%	1 qt/A	POST3	4809	4175	3630	1239	
Cotton & Peanut Mix	1 gal/A	POST3	4643	3630	3428	1015	6976
Quick Boost Ultra	1 gal/A	POST3	4716	4610	3549	1007	
Humic Acid	1 gal/A	POST10	4375	4683	3711	1245	5955
Fulvic Acid	1 gal/A	POST10	4187	4501	3307	1045	5824
Liquid Chicken	1 gal/A	POST10	4386	4283	3791	1365	5917
Humic Acid	0.6 gal/A	POST10	4072	4175	3590	1447	6103
Fulvic Acid	0.1 gal/A						
Liquid Chicken	0.3 gal/A						
Humic Acid	1 gal/A	POST	4842	4574	3590	1193	5579
+ Foliar							
LSD (P=.10)			NS	NS	NS	NS	NS
Standard Deviation			454	570	301	456	663
CV			10	14	9	37	11
Test Mean			4579	4202	3526	1240	6215

Foliar Product Evaluation Trials - 2005

Treatment	Rate	Timing	AG-Cares	Lamb-1	Lamb-2	Terry	Wilbarger
					Grade		
			--		(%)		--
Untreated			76	72	74	76	71
Peanut Gro 4-2-1	1 qt/A	POST3	76	70	73	76	70
CoRoN	3 gal/A	POST2	76	71	75	76	71
Elemax Nutrient Conc	1 qt/A	POST2	77	73	73	75	72
CoRon	1 gal/A						
Tracite Iron 5%	1 qt/A	POST3	77	71	72	75	
Cotton & Peanut Mix	1 gal/A	POST3	76	72	72	75	72
Quick Boost Ultra	1 gal/A	POST3	76	71	74	75	
Humic Acid	1 gal/A	POST10	76	72	73	76	71
Fulvic Acid	1 gal/A	POST10	76	71	73	75	72
Liquid Chicken	1 gal/A	POST10	77	70	73	76	71
Humic Acid	0.6 gal/A	POST10	76	72	73	76	72
Fulvic Acid	0.1 gal/A						
Liquid Chicken	0.3 gal/A						
Humic Acid	1 gal/A	POST	7	7	7	7	73
+ Foliar							
LSD (P=.10)			NS	NS	NS	NS	NS
Standard Deviation			1	1	1	1	1
CV			1	2	2	2	2
Test Mean			76	71	73	76	72

CROP ROTATION SYSTEMS FOR SOUTH TEXAS PEANUT PRODUCTION

W. James Grichar [1], A. J. Jaks [1], and Lawrence L. Falconer [2]

OVERALL SUMMARY OF CROP ROTATION STUDY IN 2005

This was the initial year for the crop rotation study. Plots were established with corn, cotton, grain sorghum, and peanuts planted in the respective plots.

INTRODUCTION

Rotation systems in peanut help to reduce diseases as well as improve soil quality and can result in an increase in peanut yields. Over the past few years, more cotton continues to be planted in the south Texas peanut growing region and the general consensus is that this trend in increased cotton acreage will continue over the next few years. As these acres increase, growers continue to question the effects of a cotton-peanut rotation on disease development and peanut yield and quality. These growers have seen reports from the southeast and other peanut growing regions on the benefits of a cotton-peanut rotation but there has been little or no work in the southwest, specifically south Texas, evaluating the effects of a rotation system. Therefore, research information is needed on the effects of rotation on peanut yield and quality in the south Texas area. Also, the economics of these rotation systems need to be investigated to determine the most economical system for producers.

MATERIALS AND METHODS

Field studies were initiated at the Texas Agricultural Research site at Yoakum during the 2005 growing season. The following rotation systems based on a four-year rotation were established with the following cropping systems: 1) continuous peanuts, 2) corn-peanuts-corn-peanuts, 3) cotton-peanuts-cotton-peanuts, 4) cotton-cotton-peanuts-peanuts, 5) grain sorghum-peanuts-grain sorghum-peanuts, and 6) corn-cotton-peanuts-peanuts. Corn (Pioneer 31G20) and grain sorghum (Garst 5624) were planted on April 7. This was a late corn planting but rains in March prevented getting into the field for an earlier planting. Cotton (PSC410RR) was planted on April 28 while peanut (T-96) was planted on June 7. Plots were fertilized and maintained throughout the growing season with the proper growing techniques for each crop. Sprinkler irrigation was applied during the growing season as needed for the various crops. Crops were harvested when mature.

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RESULTS AND DISCUSSION

Cropping system yields were as follows: 1) peanuts, 2791 lbs/A; 2) corn, 85 bu/a; 3) cotton, 2.4 bales/A; 4) cotton, 2.3 bales/A; 5) grain sorghum, 2780 lbs/A; and 6) corn, 68.7 bu/A. Due to dry weather conditions, soil-borne or foliar diseases never became a problem. Due to the late planting of corn for the area, corn yields were lower (68 to 85 bu/A) than expected.

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Long-term P & K Fertility for West Texas Peanut-Cotton Cropping System
Gaines and Dawson County, Texas
Year 5—2005 & Five-Year Summary

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OBJECTIVE:

This report continues the project initiated in 2001. Response to P and K fertilizer in peanut is often difficult to measure. Soil tests in West Texas report high K, and P is often high as well. One- and two-year fertility projects addressing P and K in peanuts will not provide adequate results. A long-term fertility project was needed whereby peanut, as well as its rotational crop (cotton), is fertilized at a range of nutrient levels, each of which is retained on the same land area over time. Results will assist producers in examining the economic value of P and K for peanut and cotton in a three-year rotation.

The objective of this proposal is to continue the long-term P&K fertility site at AGCARES, Lamesa, TX, to gauge long-term impact and optimum levels of different P and K fertilizer regimes in a three-year peanut-cotton rotation.

METHODS AND PROCEDURES:

Peanuts

	Dawson County
Soil Type:	Amarillo fine sandy loam
Peanut variety:	Flavor Runner 458
Planting:	April 29, 2005 on 40” rows
Previous Crop:	Cotton (2 years)
Seeding Rate:	~5.7 seeds per row foot
Plot Set-up:	Same
Harvest Area:	4 rows X 30’
Inoculant:	Nitragin Soil Implant granular, 1X
N Fertilizer:	~40 lbs. N/A
Herbicide:	Prowl
Insecticide:	None
Rainfall:	10” during growing season
Irrigation level:	13”
Date Dug:	October 21, 2005
Date Harvested:	October 28, 2005

Cotton

Dawson County

Soil Type:	Amarillo fine sandy loam
Cotton variety:	Paymaster 2326RR/BG
Planting:	May 10, 2005 on 40" rows
Previous Crop:	Set 1 (UNR), cotton; set 2, peanuts
Seeding Rate:	15 lbs./A
Harvest Area:	2 rows X 30' (stripper)
N Fertilizer:	~60 lbs. N/A
Herbicide:	Treflan, 1.5 pt/A
Rainfall:	10" during growing season
Irrigation level:	North pie, 10"
Date Harvested:	November 2, 2005

Each individual plot was marked and the position recorded with a GPS unit so we can come back on the same location in 2005. Soil samples were collected from 0-12" depth.

Texas A&M soil tests on the peanut ground indicated 24 ppm P (moderate), and potassium, 277 K (high). Slight trends were observed reflecting application (or lack thereof) of P and K in early 2005.

Fertilizer application for P used 10-34-0 applied with rolling coulters leading a knife rig, banded 4" deep. Equivalent amounts of N were applied to each plot to ensure that all plots received the same amount of N. Potash application for K used 0-0-60, which also was incorporated into the surface.

RESULTS AND DISCUSSION:

Peanut

There was no significant yield response to K or P in this fifth year of fertilizer application. Yields were 4,300 lbs./A at AGCARES. Although we believe that as this study continues for up to six years that crop response may begin to respond to residual fertility, we have not seen consistent evidence of it yet. It is possible that with soil K levels already high that addition of more K could interfere with calcium uptake. This information should be valuable in helping West Texas peanut and cotton farmers gauge the value of their particular approach to fertilizer use.

Table 1: Peanut yield response to P and K at AGCARES, 2005 (fifth year of long-term same site study).

Treatment	P2O5 (lbs./A)	K2O (lbs./A)	Peanut Yield (lbs./A)^
1	0	0	4188
2	30	0	4365
3	60	0	4290
4	0	80	4312
5	30	80	4216
6	60	80	4401
Trial average			4295
P-Value:	0.4406	0.6218	
P-Value interaction (P2O5 X K2O): 0.8119 Least significant difference (LSD), 0.10			NS
Trial coefficient of variation (CV)			10.6%

Cotton

We observed significant yield response to P in 2005 for the first time as yields were the highest they have been for this trial. Also, cotton yields after peanut were also higher for K applications (Tables 2-3). A slight response to K in cotton after peanut had been observed at WPG in 2003. With high soil test levels of residual fertility for K this any response is not expected. Potassium response is often seen not in the crop the year it was applied but in the subsequent crop, but we have not observed this in this trial.

Table 2: Cotton yield response to P and K at AGCARES, 2005 (south pie, cotton after cotton after peanut), fifth year of long-term same site study).

Treatment	**P2O5 (lbs./A)**	**K2O (lbs./A)**	**Lint Yield (lbs./A)^**
1	0	0	1388
2	30	0	1574
3	60	0	1825
4	0	80	1638
5	30	80	1642
6	60	80	1780
Trial average			1641
P-Value:	0.0244	0.8614	
P-Value interaction (P2O5 X K2O): 0.4620			
Least significant difference (LSD), 0.10			**206**
Trial coefficient of variation (CV)			8.3%

Table 3: Cotton yield response to P and K at AGCARES, 2005 (northwest pie, cotton after peanut after cotton), fifth year of long-term same site study).

Treatment	**P2O5 (lbs./A)**	**K2O (lbs./A)**	**Lint Yield (lbs./A)^**
1	0	0	1480
2	30	0	1777
3	60	0	1889
4	0	80	1521
5	30	80	1761
6	60	80	1909
Trial average			1723
P-Value:	0.0326	0.1226	
P-Value interaction (P2O5 X K2O): 0.8744			
Least significant difference (LSD), 0.10			236
Trial coefficient of variation (CV)			9.8%

A five-year summary is included for field yield trial results for peanut and cotton treated with long-term P & K fertilizer (Table 4). After four years little effect has been observed for response to either nutrient.

Table 4. Summary of long-term P and K applications to peanut and cotton in a three-year rotation (Gaines and Dawson Counties, Texas, 2001-2005).

Nutrient	Location	2001	2002	2003	2004	2005
Phosphorus	WPG--Peanut	NS	NS (T)	**	NS	
	AGCARES--Peanut	NS	NS	NS	NS	NS
	WPG--Cotton after peanut after cotton	NS	**	NS	NS (T)	
	WPG--Cotton after cotton after peanut	NS	**	NS	NS	
	AGCARES--Cotton after peanut after cotton	NS	NS (T)	NS	NS	**
	AGCARES--Cotton after cotton after peanut	NS	NS	NS	NS	**
Potassium	WPG-Peanut	NS	NS	NS	NS	
	AGCARES-Peanut	NS	NS	NS	NS	NS
	WPG--Cotton after peanut after cotton	NS	NS	*	NS	
	WPG--Cotton after cotton after peanut	NS	NS	NS	NS	
	AGCARES--Cotton after peanut after cotton	NS	NS	NS	NS	*
	AGCARES--Cotton after cotton after peanut	NS	NS	NS	NS	NS

NS, not significant at α = 0.10
NS (T), not significant at α 0.10, though upward trend noted in crop response to nutrient
*, significant at α = 0.10
**, significant at α = 0.05

On-Farm Peanut Demostrations of Irrigation Technology, Water Management, and Pest Monitoring

Bob Robinson, TCE Regional Program Director, Ag and Natural Resources
Ordie R. Jones, Panhandle AgriPartners Coordinator

The Panhandle AgriPartners Program was initiated as a means of providing technical support to university Research, Extension, and Industry applied research and demonstration activities. Farm Demonstration Assistants based in five Extension offices operate under the supervision of county Extension Agents-Agriculture and are available to take samples, gather data, conduct surveys and perform routine activities associated with demonstrations, surveys, and applied research projects. The projects and demonstrations are managed by Texas A&M Research Scientists and Engineers or Extension specialists in cooperation with agricultural producers, commodity groups, industry technical and sales representatives, crop consultants, and water districts. The objectives of the AgriPartner Program are to assist in (1) providing NOW current and up-to-date information on water use, crop development and growth, and pest status to farmers and consultants to assist in making decisions regarding agricultural operations. (2) conduct irrigation and cropping demonstrations on cooperators farms to demonstrate and test improved farming and irrigation practices, genetics, new technologies, and (3) providing accurate and current databases for developing and calibrating crop, water use, and economic models used in the NPET and other Production Agriculture modeling and prediction efforts. These on-site farm-based projects also serve as building blocks to advance the TAMU System initiatives in water conservation, improved production agriculture, and other University programs. One of the most important facets of the AgriPartner program is that it uses the local county Extension Agent network to conduct on-site demonstrations and applied research in producer fields. This cannot be accomplished without the cooperation of numerous producers in the Texas Panhandle. We thank all 32 of our producer-partners for their participation and valued advice, counsel and input into these projects. Farm Demonstration Assistants are located in Moore, Ochiltree, Randall, Gray, and Collingsworth counties. The assistants also help with demonstrations and surveys in surrounding counties; thus the entire Panhandle is covered. In 2005 AgriPartners conducted 8 small grain and 36 summer cropping and irrigation demonstrations with peanut, sorghum, wheat, corn, cotton, and soybean, involving more than 4,000 acres. Most demonstrations were irrigated with center pivot irrigation systems. Dryland demonstrations with sorghum and wheat were also conducted. All demonstrations are tied in to the Texas High Plains Evapotranspiration (TXHPET) network, aimed at providing real-time current information to the producer so that problems can be addressed as they occur, not next year. Irrigation and water use data are also used to update the Senate Bills 1 and 2 mandated Regional Water Plan for the Panhandle. Pest trapping/survey results are published weekly to provide up-to-date regional information on pest outbreaks and buildups as they occur. Information is also used in verifying pest development models. Insect and disease surveys are carried out for most major pests. AgriPartners is up and running, working to build partnerships that strongly support and benefit Panhandle Agriculture. For more information about AgriPartners, contact Dr. Bob Robinson, TCE Regional Agriculture Program Director or Ordie R. (Reggie) Jones, Panhandle AgriPartners Coordinator at the Texas A&M Research and Extension Center, Amarillo (806-677-5600) or your local County Extension Agent.

The AgriPartners website is http://amarillo.tamu.edu/programs/agripartners/irrigation2005.htm

Table 1. Peanut Irrigation and Production, 2005, Panhandle AgriPartners

		WATER-INCHES		PET		PRODUCTION	
						LB/ACRE/IN	
COUNTY	GROWER	IRRIGATION	RAIN/IRRIG/SOIL	% OF	LB/AC	IRRIGATION	RAIN/IRRIG/SOIL
Collingsworth	Joe Baumgardner	16.13	27.28	123	4498	278.86	164.88
Collingsworth	Tony Cox	15.00	28.00	130	4386	292.40	156.64
Collingsworth	Dan & Rex Henard	12.58	23.03	104	4260	338.63	184.98
Collingsworth	Jim Cabbell	11.13	27.58	125	4155	373.32	150.65
Collingsworth	Dan Langford	10.34	19.72	98	2930	283.37	148.58
AVERAGE 2005	5	13.04	25.12	116	4046	310.36	161.05
AVG '98'99'00'01'02'03'04'05	39	17.33	28.55	131	3895	224.79	136.40

All irrigated by Center Pivot Systems

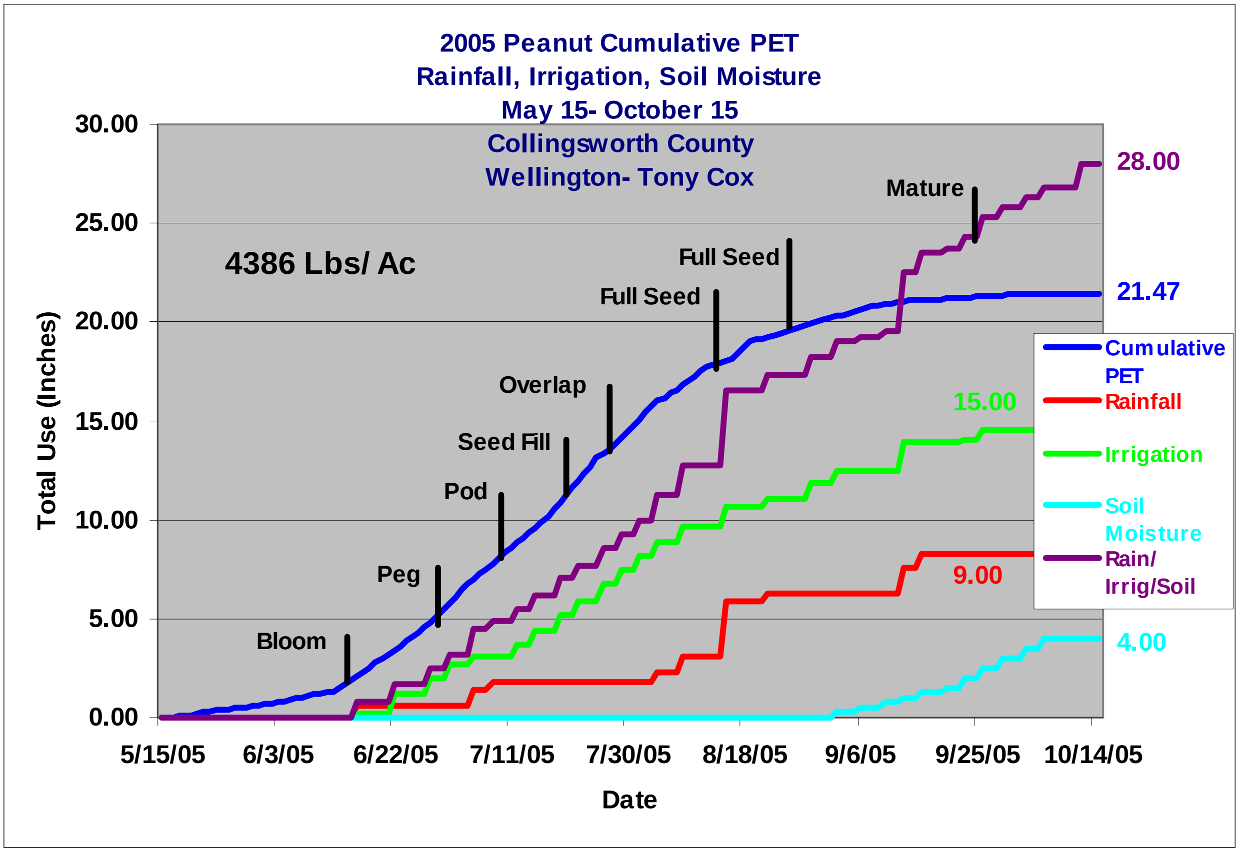
Peanut Production Per Inch of Water

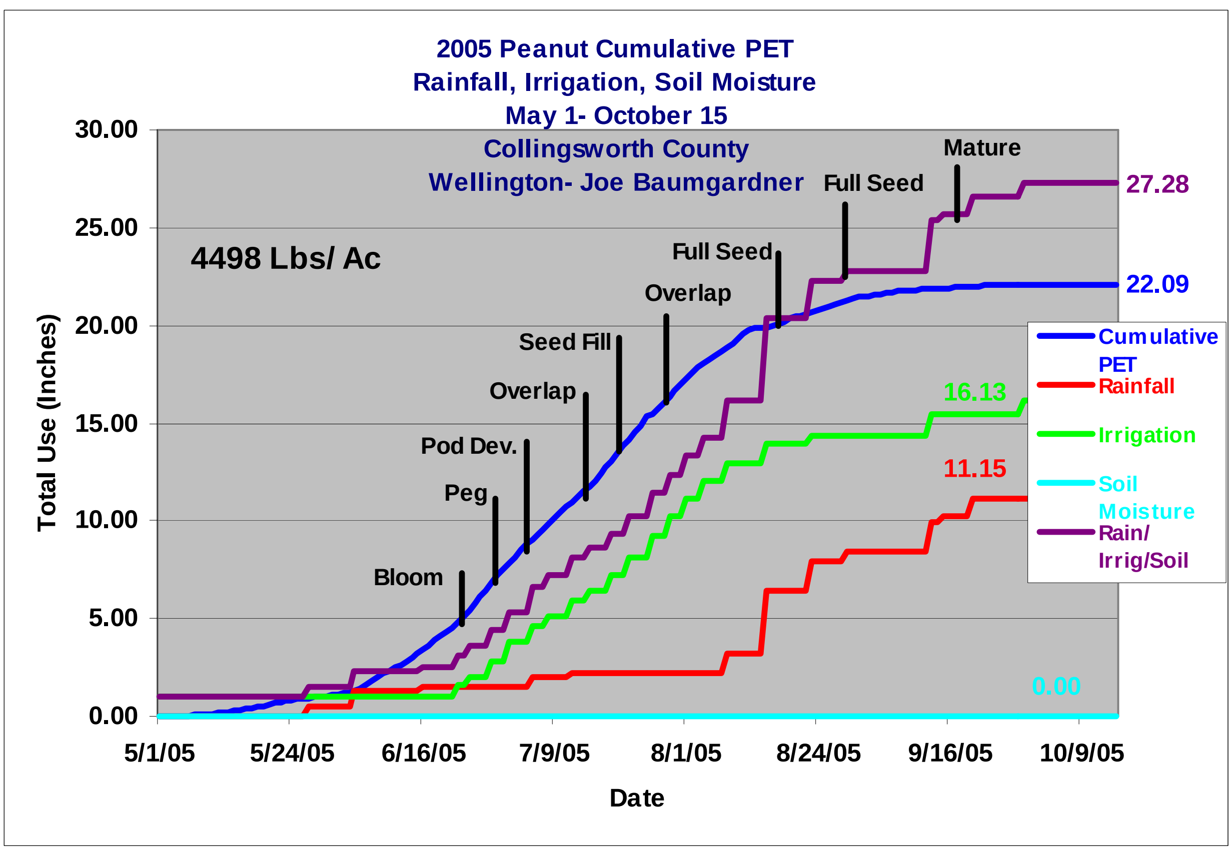
'98, '99, '00, '01, '02, '03, '04, '05 AgriPartners

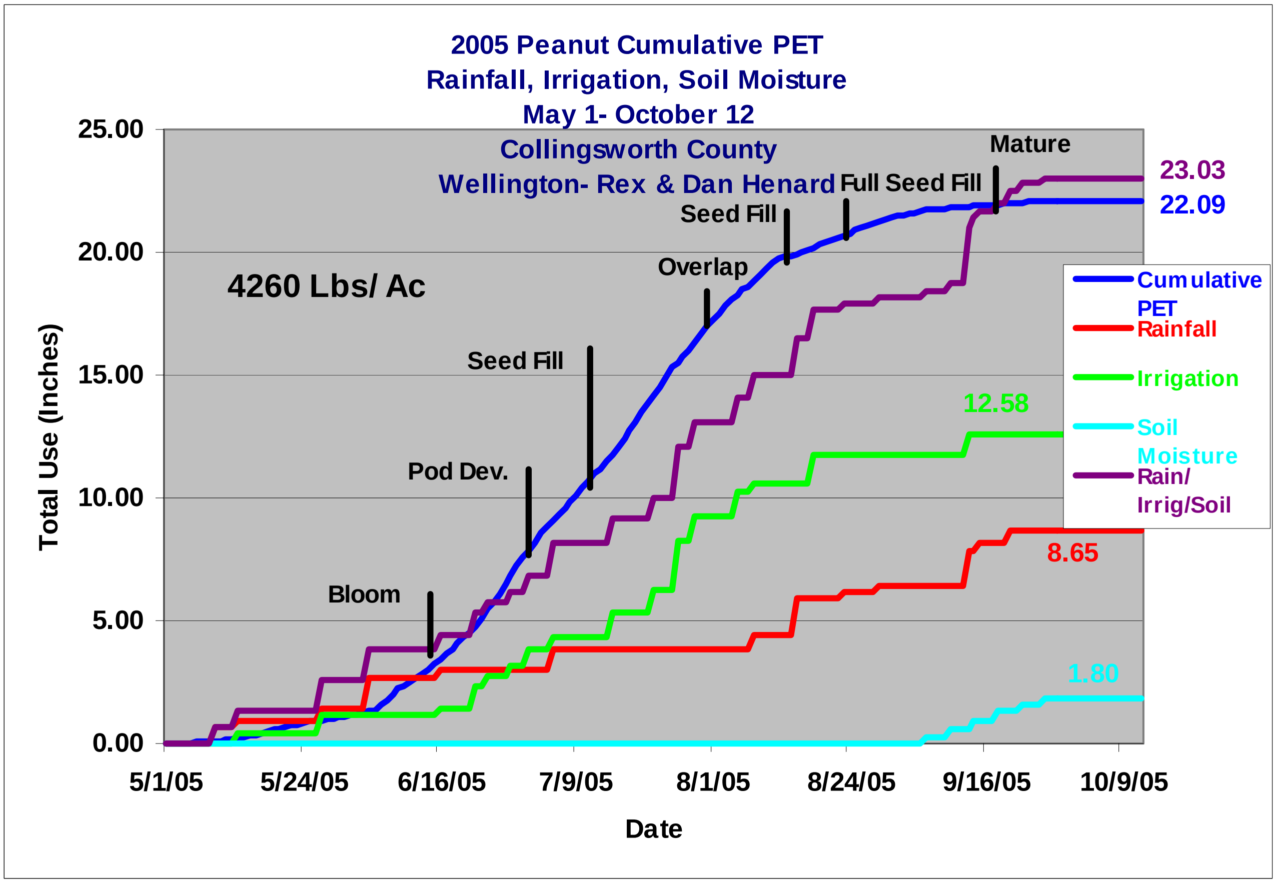
		WATER - INCHES		PET	PRODUCTION		
County	Year	Irrigation	Rain/Irrig/Soil	% of	LBS/Ac	LBS/Ac - In Irrigation	LBS/Ac - In Rain/Irrig/Soil
Collingsworth	'98	22.60	25.68	104	5208	230.44	202.80
Collingsworth	'98	20.15	27.54	111	5132	254.69	186.35
Collingsworth	'01	25.75	32.60	138	4837	187.84	148.37
Collingsworth	'02	15.65	25.30	123	4787	305.88	189.21
Collingsworth	'01	17.89	26.23	103	4726	264.17	180.18
Collingsworth	'98	22.65	29.35	118	4500	198.68	153.32
Collingsworth	'05	16.13	27.28	123	4498	278.86	164.88
Collingsworth	'03	22.48	34.88	161	4411	196.22	126.46
Collingsworth	'05	15.00	28.00	130	4386	292.40	156.64
Collingsworth	'02	22.09	35.44	169	4367	197.69	123.22
Collingsworth	'05	12.58	23.03	104	4260	338.63	184.98
Collingsworth	'02	16.82	26.82	128	4254	252.91	158.61
Collingsworth	'04	12.87	25.62	120	4217	327.66	164.60
Collingsworth	'99	12.85	26.43	123	4200	326.85	158.91
Collingsworth	'05	11.13	27.58	125	4155	373.32	150.65
Wheeler	'02	8.95	21.45	105	4009	447.93	186.90
Collingsworth	'99	22.70	37.80	175	3984	175.51	105.40
Collingsworth	'00	20.35	30.06	160	3900	191.65	129.74
Collingsworth	'99	20.65	33.70	156	3892	188.47	115.49
Collingsworth	'02	15.87	25.27	120	3879	244.42	153.50
Collingsworth	'01	18.51	25.54	108	3800	205.29	148.79
Collingsworth	'01	18.50	24.32	106	3750	202.70	154.19
Collingsworth	'03	13.20	25.30	113	3750	284.09	148.22
Collingsworth	'03	17.53	32.08	143	3750	213.92	116.90
Collingsworth	'00	24.07	37.87	177	3740	155.38	98.76
Collingsworth	'01	17.83	23.40	99	3658	205.16	156.32
Collingsworth	'04	15.47	25.33	119	3624	234.26	143.07
Hall	'04	14.60	32.39	152	3506	240.14	108.24
Collingsworth	'03	28.60	40.75	182	3427	119.83	84.10
Collingsworth	'00	26.61	39.96	186	3422	128.60	85.64
Collingsworth	'02	15.47	25.17	120	3400	219.78	135.08
Donley	'04	5.40	23.46	110	3400	629.63	144.93
Donley	'99	13.25	29.90	140	3240	244.53	108.36
Collingsworth	'00	19.43	32.33	151	3200	164.69	98.98
Donley	'04	8.90	23.18	111	3200	359.55	138.05
Wheeler	'03	9.30	18.98	88	3194	343.44	168.28
Wheeler	'04	14.20	23.01	111	3000	211.27	130.38
Collingsworth	'05	10.34	19.72	98	2930	283.37	148.58
Donley	'00	29.35	40.86	188	2300	78.36	56.29
Average	39	17.33	28.55	131	3895	224.79	136.40

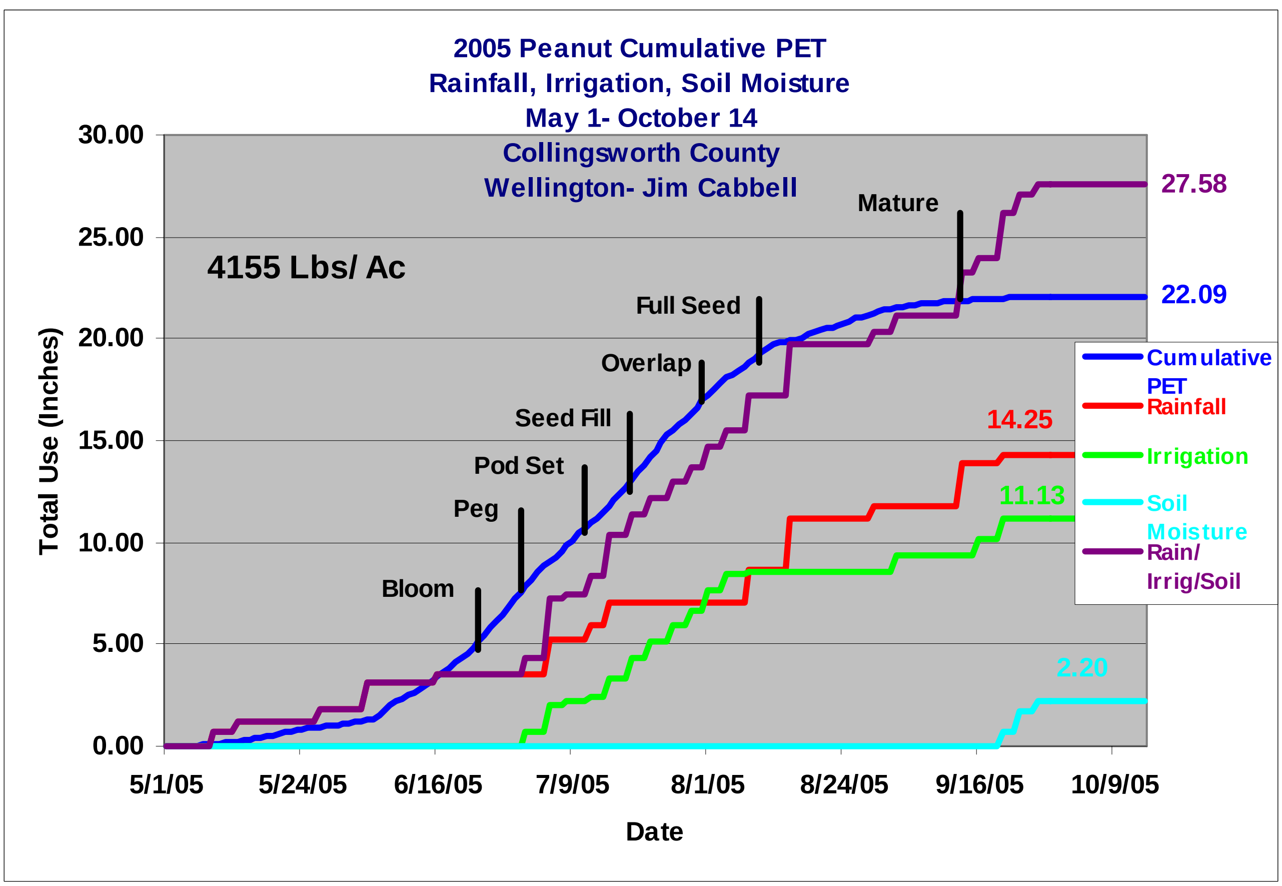
All irrigated by Center Pivot
Systems

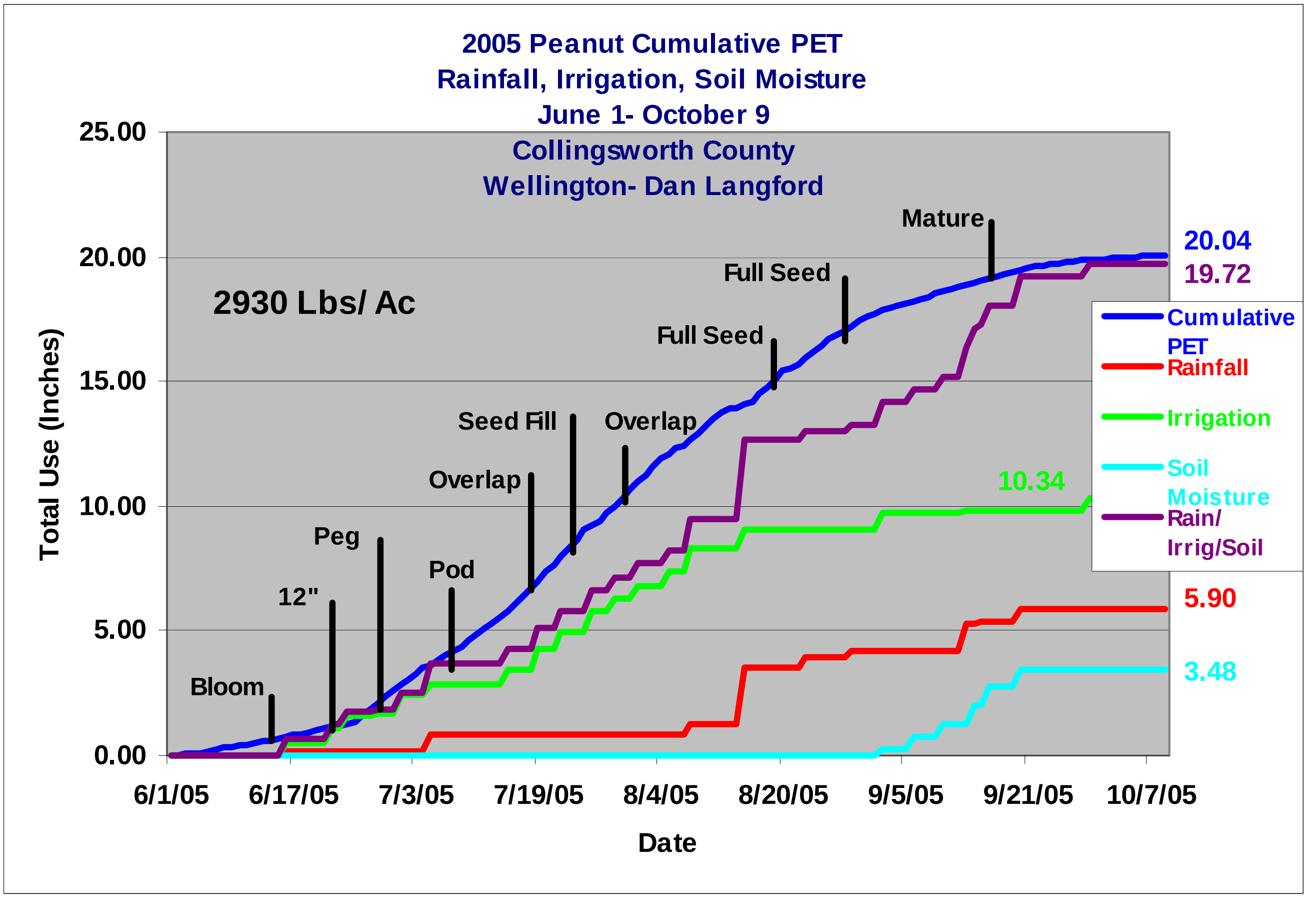
Prepared by: Leon New, Professor/Extension Agricultural Engineer - Irrigation, Texas A&M Research and Extension Center, Amarillo, Texas.


2005 Peanut Cumulative PET
Rainfall, Irrigation, Soil Moisture
May 15- October 15
Collingsworth County
Wellington- Tony Cox
4386 Lbs/ Ac
Total Use (Inches)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Bloom
Peg
Pod
Seed Fill
Overlap
Full Seed
Full Seed
Mature
28.00
21.47
15.00
9.00
4.00
Cumulative PET
Rainfall
Irrigation
Soil Moisture
Rain/ Irrig/Soil
5/15/05
6/3/05
6/22/05
7/11/05
7/30/05
8/18/05
9/6/05
9/25/05
10/14/05
Date


2005 Peanut Cumulative PET
Rainfall, Irrigation, Soil Moisture
May 1- October 15
Collingsworth County
Wellington- Joe Baumgardner
4498 Lbs/ Ac
Total Use (Inches)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Bloom
Peg
Pod Dev.
Overlap
Seed Fill
Overlap
Full Seed
Full Seed
Mature
27.28
22.09
16.13
11.15
0.00
Cumulative PET
Rainfall
Irrigation
Soil Moisture
Rain/ Irrig/Soil
5/1/05
5/24/05
6/16/05
7/9/05
8/1/05
8/24/05
9/16/05
10/9/05
Date


2005 Peanut Cumulative PET
Rainfall, Irrigation, Soil Moisture
May 1- October 12
Collingsworth County
Wellington- Rex & Dan Henard
4260 Lbs/ Ac
Mature
Full Seed Fill
Seed Fill
Overlap
Seed Fill
Pod Dev.
Bloom
23.03
22.09
12.58
8.65
1.80
Cumulative PET
Rainfall
Irrigation
Soil Moisture
Rain/ Irrig/Soil
Total Use (Inches)
25.00
20.00
15.00
10.00
5.00
0.00
5/1/05
5/24/05
6/16/05
7/9/05
8/1/05
8/24/05
9/16/05
10/9/05
Date


2005 Peanut Cumulative PET
Rainfall, Irrigation, Soil Moisture
May 1- October 14
Collingsworth County
Wellington- Jim Cabbell
4155 Lbs/ Ac
Mature
Full Seed
Overlap
Seed Fill
Pod Set
Peg
Bloom
27.58
22.09
14.25
11.13
2.20
Cumulative PET
Rainfall
Irrigation
Soil Moisture
Rain/ Irrig/Soil
Total Use (Inches)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
5/1/05
5/24/05
6/16/05
7/9/05
8/1/05
8/24/05
9/16/05
10/9/05
Date


2005 Peanut Cumulative PET
Rainfall, Irrigation, Soil Moisture
June 1- October 9
Collingsworth County
Wellington- Dan Langford
2930 Lbs/ Ac
Total Use (Inches)
25.00
20.00
15.00
10.00
5.00
0.00
Bloom
12"
Peg
Pod
Overlap
Seed Fill
Overlap
Full Seed
Full Seed
Mature
20.04
19.72
10.34
5.90
3.48
Cumulative PET
Rainfall
Irrigation
Soil Moisture
Rain/ Irrig/Soil
6/1/05
6/17/05
7/3/05
7/19/05
8/4/05
8/20/05
9/5/05
9/21/05
10/7/05
Date