Partners in Progress
PEANUTS

Peanut Research at OSU 2017

Supported by the

Oklahoma Peanut Commission

and the

National Peanut Board

Oklahoma State University
Division of Agricultural Sciences
and Natural Resources
Oklahoma Agricultural Experiment Station
Oklahoma Cooperative Extension Service

In cooperation with the
U.S. Department of Agriculture -
Agricultural Research Service

P-1052

Partners in Progress PEANUTS

Partners in Progress PEANUTS

Peanut Research at OSU 2017

Supported by the

Oklahoma Peanut Commission

and the

National Peanut Board

Oklahoma State University
Division of Agricultural Sciences and Natural Resources
Oklahoma Agricultural Experiment Station
Oklahoma Cooperative Extension Service

In cooperation with
U.S. Department of Agriculture - Agricultural Research Service

P-1052

This report of the Oklahoma Agricultural Experiment Station is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of $793.81 for 250 copies. 0218 LM.

Table of Contents

Partners in Progress
PEANUTS

Foreword

Oklahoma State University has a long-standing partnership with the Oklahoma Peanut Commission and the peanut producers of this state. Peanut acreage and production in Oklahoma have been increasing over the last several years. New varieties, disease resistance, and fungicide programs developed by OSU and the USDA-ARS have aided the peanut industry. There have been good times and bad times in terms of state budget restraints, shifts in peanut production locations in the state and changes in the federal peanut program. Together, we have survived and are looking forward to a brighter future.

Our *Partners in Progress Peanut Research at OSU 2017* report serves as a means to highlight significant accomplishments in research and Extension programming that have been supported in partnership with the OPC and the National Peanut Board. With all the work that has been accomplished, it is important to recognize that much more to be done to keep our peanut producers competitive and in business. Therefore, our work must be focused on solving meaningful issue-based problems facing the peanut producers in Oklahoma.

This report is one means of being accountable for the funds we have received and communicating the latest results of our programs to peanut producers as rapidly as possible.

Keith Owens
Assistant Vice President and Director
Oklahoma Agricultural Experiment Station
Division of Agricultural Sciences and Natural Resources
Oklahoma State University

Oklahoma State University Division of Agricultural Sciences and Natural Resources Mission Statement

The mission of the Oklahoma State University Division of Agricultural Sciences and Natural Resources is to discover, develop, disseminate and preserve knowledge needed to enhance the productivity, profitability and sustainability of agriculture; conserve and improve natural resources; improve the health and well-being of all segments of our society; and to instill in its students the intellectual curiosity, discernment, knowledge and skills needed for their individual development and contribution to society.

Enhancing Peanut Production Profitability through Research and Extension

Agricultural industries in Oklahoma and at the national level continue to struggle with low commodity prices and returns below the cost of production for most crops. Peanuts continue to be an exception to this trend offering some rare but very welcome positive news. After several years of declining plantings, 2017 saw more acres of peanuts going in for the second consecutive year.

Oklahoma peanut producers increased plantings by 35 percent between 2015 and 2016, and by more than 70 percent between 2016 and 2017. In 2017, almost 20,000 acres of peanuts representing runner, Spanish and Virginia market types went into the ground.

Large plantings in the southeast U.S. and excess production carried over from previous crops continue to limit both contract availability and contract prices. Fortunately, these conditions have been a little less problematic in the last two years. A positive trend of increased contract availability and better contract prices is welcomed by an Oklahoma peanut industry.

A favorable growing season, followed by good maturing conditions, resulted in an excellent crop in terms of both production and quality. Yields in 2017 were around 3,800 pounds per acre. Prices are such that growers must still carefully manage inputs in every phase of production. Despite tight margins, peanuts can still produce a profit for efficient growers and with the prospects for the overall farm economy to remain sluggish, peanuts will continue to be favored by those having experience and commitment to the crop.

The results of OSU and USDA-ARS research programs continue to provide essential information for producers during a very challenging time. Recent peanut variety releases by USDA-ARS at the Peanut Improvement Center in Stillwater have been welcomed by producers and the industry. Due to their high yielding ability, outstanding quality and disease resistance, new varieties OLé and Lariat are positively impacting the Oklahoma peanut industry, and the state's agricultural economy as well.

Similarly, OSU and USDA-ARS research programs are providing growers with much needed answers for yield-robbing diseases and weed problems. Partial funding for this research is being provided through the NPB and the OPC.

The NPB is a grower-funded national research, promotion and education checkoff program with growers from 10 states submitting funds and in turn, receiving research and promotion funds back in those states. As part of an ongoing partnership, in FY17 the OPC teamed with OSU and USDA-ARS to submit research proposals to the NPB. NPB provided $17,553 in research funding for OSU and USDA-ARS. Funded research projects were: Integrated Management of Peanut Diseases; Evaluation of Advanced Breeding Lines and Current Peanut Varieties across Oklahoma; and Weed Management in Oklahoma Peanuts. Results of those research projects are of great interest to Oklahoma producers and are presented in this report.

An additional positive note is the national peanut industry is benefiting from increasing per capita peanut consumption. For Oklahoma to profit from this good news, growers must continue to have access to research based results and recommendations as they make production decisions. The OPC will continue to team with OSU and USDA-ARS which will provide critical assistance and NPB which will deliver essential resources. All have a commitment to a robust peanut industry in the state and Oklahoma's peanut growers are very appreciative of that fact.

Oklahoma's peanut producers and the OPC are proud of their long and productive history with OSU, USDA-ARS and NPB and look forward to the future shared benefits of continuing this partnership.

Ron Sholar
Executive Director
Oklahoma Peanut Commission

Peanut Variety Tests

Kelly D. Chamberlin and Rebecca S. Bennett
USDA-ARS, Stillwater

John P. Damicone
Department of Entomology and Plant Pathology

2017 progress made possible through OPC and NPB support

- **Performance of runner varieties depended on location but averages across locations indicate advanced breeding line ARSOK R47A was the top performer.**
- **No significant differences were seen among Spanish entries across locations and over years, but cultivars AT-9899 and OLé performed best numerically.**
- **The high-oleic Virginia-type breeding line RSOK V85-377 numerically out-yielded all other Virginia entries across locations in 2017 and across years and locations for 2016-2017.**

Peanut production in Oklahoma is generally located in three geographical regions across the state: southwestern, west-central and far west. Each region differs from the others in environmental and biological stressors that affect crop production, so the same peanut cultivar will likely perform differently in each growing region. Therefore, the Oklahoma Peanut Variety trials are conducted in each region annually and are designed to test the performance of commonly grown cultivars and potential cultivar releases against each other. Results of these annual trials can serve as a guide for producers when choosing a cultivar to plant.

Variety Trial Methods

All entries (cultivars and advanced breeding lines) in the Oklahoma Peanut Variety trials were high-oleic with the exception of the Virginia-type cultivar Jupiter. The following entries were included in all locations in 2017; 10 runner-types: Flavor Runner 458, Georgia 09B, Tamrun OL11, Lariat, Webb, ARSOK R47A, ARSOK R90-12, ARSOK R92-13, ARSOK 93-10 and ARSOK R94-4; five Spanish-types: AT-9899, OLé, Tamnut OL06, Schubert and ARSOK S88-1; and six Virginia types: Florida Fancy, Jupiter, VENUS, Wynne, ARSOK V85-7 and RSOK V85-377.

All variety trials were conducted under an extensive pest management program. The objective was to prevent as much outside influence from pest pressures (weed, disease and insect) on yield and grade as possible. The interaction between variety and location was significant, so the results were separated by location. Since the varieties and advanced lines response differed by location, growers may find the data for the county closest to their location to be the most useful in selecting a variety or varieties to grow. All test plots were planted using two 36-inch rows that were 20 feet long. Plots were seeded at a rate of five seeds per row foot (139,392 seeds per acre). Trials were conducted using randomized complete block design with four replications. The entire plot was dug and then thrashed two to three days

later. Peanuts were placed in a dryer until moisture reached 10 percent. Percent total sound mature kernels, or TSMK, were determined on a 200-gram sample from each plot.

Revenue per acre was determined by converting estimated plot yields to tons per acre and using the current market price values for each market-type (runner = $424 per ton; Spanish = $413 per ton; Virginia = $430 per ton) as of December 2017 (USDA FSA). No adjustments were made for damaged kernels or concealed damage. Virginia $/a values may be underestimated, as grade is not as large a factor for in-shell peanuts. Calculations of $/a are based on yield and grade only, and do not include possible input costs. The following formula was used: $/a = yield (tons per acre) × market price ($/ton) × grade.

Virginia market-type pod distribution was determined for all replications and locations for each entry on a 500-gram pod sample. Pod brightness (Hunter L-score) for each Virginia market-type entry also was determined on the 500-gram samples using a Hunter Lab D25 NC colorimeter.

Pod rot ratings were made within five hours of digging by visually estimating the percentage of discolored pods within each two-row plot. Data were analyzed using one-way ANOVA in PROC GLIMMIX of SAS (ver. 9.3). The Type I error rate for pairwise comparisons of cultivars within each market type was controlled using the Tukey-Kramer adjustment.

Interpreting Data

Details of establishment and management of each test are listed in footnotes below the tables. Least significant differences, or LSD, are listed at the bottom of all but the performance summary tables. Differences between varieties are significant only if they are equal to or greater than the LSD value. If a given variety out-yields another variety by as much or more than the LSD value, there is 95 percent certainty the yield difference is real, with only a 5 percent probability the difference is due to chance alone. For example, if variety X is 500 pounds per acre higher in yield than variety Y, then this difference is statistically significant if the LSD is 500 or less. If the LSD is 500 or greater, then there is less confidence that variety X really is higher yielding than variety Y under the conditions of the test.

The coefficient of variation, or CV value, listed at the bottom of each table is used as a measure of the precision of the experiment. Lower CV values will generally relate to lower experimental error in the trial. Uncontrollable or immeasurable variations in soil fertility, soil drainage and other environmental factors contribute to greater experimental error and higher CV values. Results reported here should be representative of what might occur throughout the state but would be most applicable under environmental management conditions similar to those of the trials. The relative yields of all peanut varieties are affected by crop management and by environmental factors including soil type, summer conditions, soil moisture, disease and insects.

2017 Caddo County Peanut Variety Trial

Location: Ft. Cobb
Date Planted: 5/15/2017
Date Dug: 10/20/2017
Date Threshed: 10/24/2017

The trial was planted May 15, 2017. A conventional till seedbed was used and managed for foliar and soil-borne disease throughout the season.

Average yield for the runner test was 4,702 pounds per acre and average

grade was 71 percent TSMK (Table 1) with entries ARSOK R47A,Webb and Lariat having higher yields numerically as compared to other genotypes tested. However, no statistical differences were seen for yield among runner-type entries. Grades were lower than expected due to unusually cool months of August and September, but statistical differences were reported, with breeding line Tamnrun OL11 grading highest at 78 percent TSMK and Georgia 09B having the lowest grade at 66 percent TSMK.

Among the Spanish varieties or lines tested, the average yield and grade were 4,472 pounds per acre and 67 percent TSMK, respectively. Tamnut OL06 was numerically the top performer, but no significant differences were found among all entries Again, grades were lower than expected, but statistical differences were reported with breeding line ARSOK S88-2 and cultivar Schubert both grading highest at 71 percent TSMK and Tamnut OL06 and AT-9899 grading lowest at 63 percent TSMK.

Entries in the Virginia test averaged 5,007 pounds per acre with an average grade of 69 percent TSMK. Breeding line ARSOK V85-377 was the top yielder numerically at 5,445 pounds per acre, followed closely by cultivars Jupiter and Florida Fancy at 5,287 and 5,203 pounds per acre, respectively. North Carolina variety Wynne was the poorest performer at 4,453 pounds per acre.

Table 2 contains Caddo County yield and grade data for the last two years. Runner entries ARSOK R47A and Lariat were the top yielders during the two-year period at 5,554 pounds per acre and 5,505 pounds per acre, respectively. Statistical differences in yield and grade were not seen among runner entries. Furthermore, no significant differences were found among all spanish entries over the two years. Numerically cultivar AT-9899 was the top yielder among spanish entries averaging 4,754 pounds per acre. Statistical differences were seen among Virginia-type entries, with breeding line ARSOK V85-377 topping the group averaging 5,553 pounds per acre.

2017 Custer County Variety Trial

Location: Weatherford
Les Crall Farms
Date Planted: 5/18/2017
Date Dug: 10/24/2017
Date Threshed: 10/26/2017

The trial was planted May 18, 2017, into a conventional till seedbed and managed for foliar and soil-borne disease throughout the season.

Average yield for the runner test was 3,294 pounds per acre with an average grade of 64 percent TSMK. Lariat was the top performer, but yields were lower than in past years overall. Flavor Runner 458 had the poorest performance at 2,577 pounds per acre. Grades were low compared to past years ranging from 58 to 69 percent TSMK and significant differences were seen.

For the Spanish varieties/lines tested, the average yield was 3,726 pounds per acre and average grade was 68 percent TSMK. Significant differences were reported for yield, with breeding line ARSOK S88-2 topping the entries at 4,441 pounds per acre, and AT-9899 having the lowest yield at 3,097 pounds per acre. Again, grades were lower than in past years, ranging from 65 to 67 percent TSMK.

Virginia entries averaged 3,965 pounds per acre and a grade of 64 percent TSMK. No significant differences in yield were noted among the top three performers, which were ARSOK V85-7, Jupiter and ARSOK V85-377. Wynne had the poorest performance at 3,436 pounds per acre and a grade of 56 percent TSMK.

Table 4 contains yield and grade data for the last two years as well as two-year averages in Custer and Blaine counties.

Table 1. Yields and grades from Caddo County peanut variety trials, 2017.[4]

Variety or line	*Yield (lbs/a)*	*Percent of trial average*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
Runner[1]				
ARSOK R47 A	5,119	109	69c-e	680
Webb	4,997	106	72b-d	693
Lariat	4,888	104	71b-d	668
ARSOK R92-13	4,780	102	72b-d	663
Georgia 09B	4,743	101	66e	603
ARSOK R90-12	4,707	100	73ab	662
Flavor Runner 458	4,537	96	69de	603
ARSOK R94-4	4,465	95	72a-c	619
ARSOK R93-10	4,453	95	74ab	634
Tamrun OL11	4,332	92	78a	651
Mean	4,702		71	
CV	15.0		3.5	
LSD (0.05)	ns		3.5	
Spanish[1]				
Tamnut OL06	4,586	103	63b	542
Schubert	4,549	102	71a	606
OLé	4,477	100	66ab	555
AT-9899	4,452	99	63b	526
ARSOK S88-2	4,296	96	71a	572
Mean	4,472		67	
CV	7.2		5.7	
LSD (.05)	ns		5.8	
Virginia[1]				
ARSOK V85-377	5,445	109	69b	734
Jupiter	5,287	106	66bc	682
Florida Fancy	5,203	104	65c	661
VENUS	5,094	102	69b	686
ARSOK V85-7	4,561	91	75a	668
Wynne	4,453	89	68bc	591
Mean	5,007		69	
CV	6.1		3.5	
LSD (.05)	ns		3.6	

[1] Market Type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.

Table 2. Yields and grades from Caddo County peanut variety trials, 2016 and 2017 along with two-year averages and estimated revenue.[4,5]

Variety or line	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
	----2016----		----2017----		----2-year average----		
Runner[1]							
ARSOK R47A	5,989ab	69ab	5,119	69c-e	5,554	69	738
Lariat	6,122a	68ab	4,888	71b-d	5,505	71	753
Webb	5,493b-d	63-e	4,997	72b-d	5,245	67	677
Tamrun OL11	6,146a	71a	4,332	78a	5,238	73	736
ARSOK R92-13	5,324cd	68ab	4,780	72b-d	5,051	70	681
ARSOK 90-12	5,251c-e	65b-d	4,707	73ab	4,978	69	661
ARSOK 94-4	5,324cd	60e	4,465	72a-c	4,894	66	635
Flavor Runner 458	5,057de	66bc	4,537	69de	4,797	67	619
ARSOK R93-10	4,670e	56f	4,453	74ab	4,606	65	576
Mean	5,844	69	4,702	71	5,096	69	
CV	9.9	5.3	15	3.5	12.7	8.7	
LSD (0.05)	980	6.1	ns	3.5	ns	ns	
Spanish[1]							
AT-9899	5,057	65a	4,452	63b	4,754	64	570
Tamnut OL06	4,840	62b	4,586	63b	4,713	62	548
OLé	4,731	62b	4,477	66ab	4,604	65	562
ARSOK S88-2	4,791	62b	4,296	71a	4,543	68	580
Mean	4,855	63	4,472	67	4,653	65	
CV	4.4	2.4	7.2	5.7	6.5	4.4	
LSD (.05)	ns	2.4	ns	5.8	ns	ns	
Virginia[1]							
ARSOK V85-377	5,662ab	65bc	5,445	69b	5,553a	67ab	727
Florida Fancy	5,731a	63c	5,203	65c	5,467a	64b	683
VENUS	5,324a-c	64c	5,094	69b	5,209ab	67ab	682
Jupiter	5,166b-d	63c	5,287	66bc	4,924ab	65b	625
ARSOK V85-7	5,203bc	72a	4,561	75a	4,882ab	74a	705
Wynne	4,767d	63c	4,453	68bc	4,609b	65b	585
Mean	5,273	65	5,007	69	5,107	67	
CV	6.5	3.5	6.2	3.5	5.9	4.3	
LSD (.05)	505	3.4	ns	3.6	749	7.1	

[1] Market Type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Data not shown for all varieties tested in 2013 and used to calculate mean, CV and LSD.
[5] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.

Table 3. Yields and grades from Custer County peanut variety trials, 2017.

Variety or line	*Yield (lbs/a)*	*Percent of trial average*	*Grade[3] (%TSMK)*	*Revenue[4] ($/a)*
Runner[1]				
Lariat	4,114a	125	67ab	531
Tamrun OL11	3,944ab	120	69a	523
ARSOK R47A	3,702a-c	112	64a-c	456
Webb	3,630a-c	110	65ab	454
ARSOK R92-13	3,460a-d	105	58c	386
ARSOK R94-4	3,194b-e	97	62bc	381
ARSOK R93-10	3,024c-e	95	65ab	378
ARSOK R90-12	2,722de	83	63a-c	330
Georgia 09B	2,577e	78	66ab	327
Flavor Runner 458	2,577e	78	61bc	303
Mean	3,294		64	
CV	16.9		6.4	
LSD (0.05)	811		6.0	
Spanish[1]				
ARSOK S88-2	4,441a	119	65b	542
OLé	4,332a	116	70a	569
Tamnut OL06	3,654b	98	68a	466
Schubert	3,109bc	83	67ab	391
AT-9899	3,097c	83	67ab	389
Mean	3,726		68	
CV	9.5		3.1	
LSD (.05)	548		3.3	
Virginia[1]				
ARSOK V85-7	4,561	115	70a	624
Jupiter	4,334	109	62bc	525
ARSOK V85-377	4,053	102	67ab	531
Florida Fancy	3,944	99	59cd	454
VENUS	3,448	87	64bc	431
Wynne	3,436	87	56d	376
Mean	3,965		64	
CV	20.8		6.1	
LSD (.05)	ns		5.8	

[1] Market Type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.

Table 4. Yields and grades from Custer/Blaine County peanut variety trials, 2016 and 2017, along with two-year averages and estimated revenue.[4, 5]

Variety or line	*Yield (lbs/a)*	*Grade[2] (%TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
	----2016----		----2017----		----2-year average----		
Runner[1]							
Tamrun OL11	5,856a	74a	3,944ab	69a	4,900	71	670
ARSOK R47A	5,990a	75a	3,702a-c	64a-c	4,946	70	667
Lariat	5,445ab	75a	4,114a	67ab	4,780	71	653
ARSOK 92-13	5,832ab	74a	3,460a-d	58c	4,646	66	635
Webb	5,421ab	75a	3,630a-c	65ab	4,526	70	610
ARSOK R94-4	5,009ab	73a	3,194b-e	62bc	4,102	68	537
ARSOK R93-10	4,998ab	72ab	3,024c-e	65ab	3,811	69	506
ARSOK R90-12	4,731b	75a	2,722de	63a-c	3,727	69	495
Flavor Runner 458	4,622b	66b	2,577e	61bc	3,600	69	478
Mean	5,322	73	3,294	64	4,326	69	
CV	9.9	5.3	16.9	6.4	31.5	11.1	
LSD (0.05)	990	6.1	811	6.0	ns	ns	
Spanish[1]							
OLé	4,937ab	67	4,332a	70a	4,645	69	601
ARSOK S88-2	4,634b	71	4,441a	65b	4,538	68	575
AT-9899	5,106a	68	3,097c	67ab	4,402	68	562
Tamnut OL06	4,864ab	68	3,654b	68a	4,259	69	551
Mean	4,885	69	3,726	68	4,460	68	
CV	8.3	5.1	9.5	3.1	23.4	3.5	
LSD (.05)	396	ns	548	3.3	ns	ns	
Virginia[1]							
ARSOK V85-377	6,074a	72ab	4,053	67ab	5,064	69	682
Florida Fancy	5,844a	68c	3,944	59cd	4,894	63	602
ARSOK V85-7	4,936bc	74a	4,561	70a	4,749	72	668
Wynne	5,602a	70b	3,436	56d	4,519	63	556
Jupiter	4,682c	67c	4,334	62bc	4,513	66	582
VENUS	5,457ab	68c	3,448	64bc	4,453	66	574
Mean	5,328	70	3,965	64	4,698	67	
CV	8.3	2.2	20.8	6.1	25.1	8.1	
LSD (.05)	652	2.2	ns	5.8	ns	ns	

[1] Market type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.
[5] Data not shown for all varieties tested in 2013 and used to calculate mean, CV and LSD.

Table 5. Yields and grades from Tillman County peanut variety trials, 2017.[4]

Variety or line	*Yield (lbs/a)*	*Percent of trial average*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
Runner[1]				
ARSOK R47A	6,703a	117	69ab	890
Webb	6,231ab	109	70ab	840
Georgia 09B	6,159ab	107	63bc	747
Lariat	5,977ab	104	69ab	794
ARSOK R94-4	5,856ab	102	71ab	800
Tamrun OL11	5,650b	98	73a	794
ARSOK R90-12	5,493b	96	60c	635
ARSOK R92-13	5,493b	96	68ab	719
ARSOK R93-10	5,299cb	92	70ab	714
Flavor Runner 458	4,513c	79	66bc	573
Mean	5,737		68	
CV	11.6		7.7	
LSD (0.05)	966		7.6	
Spanish[1]				
AT-9899	6,667a	113	60b	751
ARSOK S88-2	5,965b	101	67a	750
OLé	5,917b	101	63ab	700
Schubert	5,457b	93	67a	686
Tamnut OL06	5,384b	92	57b	576
Mean	5,878		63	
CV	7.3		5.4	
LSD (.05)	663		5.2	
Virginia[1]				
ARSOK V85-377	6,683a	106	63c	822
ARSOK V85-7	6,642a	105	73a	946
VENUS	6,425ab	102	69ab	866
Jupiter	6,207ab	98	64c	775
Wynne	6,025b	95	64c	753
Florida Fancy	5,989b	95	67bc	783
Mean	6,328		67	
CV	6.2		4.4	
LSD (.05)	589		4.4	

[1] Market Type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.

ARSOK R47A and Tamrun OL11 were the top performers among runners tested, averaging 4,946 and 4,900 pounds per acre, respectively. Flavor Runner 458 had the lowest average yield at 3,600 pounds per acre. No significant differences were seen among average runner grades for the two-year period. The same was true among Spanish and Virginia types tested, with OLé and ARSOK V85-377 leading numerically.

2017 Tillman County Variety Trial

Location: Davidson
Joe D. and Gayle White Farms
Date Planted: 5/23/2017
Date Dug: 10/25/2017
Date Threshed: 10/27/2017

The trial was planted May 23, 2017 into a conventional till seedbed and managed for foliar and soil-borne disease throughout the season. Table 5 shows the yield and grade data. Average yield and grade for the runner test was 5,737 pounds per acre and 68 percent TSMK. ARSOK R47A was the top yielder at 6,703 pounds per acre and 69 percent TSMK. Statistical differences were seen among entries. Flavor Runner 458 was the poorest performer at 4,513 pounds per acre and 66 percent TSMK.

Spanish entries performed exceptionally well, with the average yield being higher than the runner entries. The average yield and grade among Spanish-type entries tested were 5,878 pounds per acre and 63 percent TSMK. AT-9899 was the top yielder at 6,667 pounds per acre, but had a grade of only 60 percent TMSK. Tamnut OL06 was the lowest yielder at 5,384 pounds per acre and a grade of 57 percent TMSK.

Average yield and grade in the Virginia-type test was 6,328 pounds per acre and 67 percent TSMK. The top yielding breeding lines were ARSOK V85-377 and ARSOK V85-7 at 6,683 and 6,642 pounds per acre, respectively. Grades of Virginia-type entries ranged from 63 to 73 percent TSMK and statistical differences were found. ARSOK V85-7 had the top grade at 73 percent TSMK.

The performance of Virginia-type entries during a two-year period is shown in Table 6. The top performer among runner types was ARSOK R47A which averaged 6,626 pounds per acre and a grade of 71 percent TSMK. Flavor Runner 458 was the poorest performer in two years at 5,120 pounds per acre. The top Spanish-type entry over the two-year period was AT-9899 averaging 6,285 pounds per acre and 66 percent TSMK. Tamnut OL06 was the lowest yielder at 5,305 pounds per acre and 61 percent TSMK. Over 2016-2017, Virginia-types averaged 6,202 pounds per acre, with the top performer numerically being breeding line ARSOK V85-377 at 6,649 pounds per acre and 65 percent TSMK. However, no statistical differences were seen among entries when data was averaged over the two year period.

Performance Across Locations, Pod Rot Incidence and Pod Brightness

Table 7 includes yield and grade data averaged across locations for 2017. Among the runner types tested, ARSOK 47A, Lariat and Webb out-yielded all others, averaging 5,175, 4,993 and 4,953 pounds per acre, respectively. Numerically, the top yielding Spanish entry across locations was OLé, but no statistical differences were observed. The top Virginia-type entries tested, numerically, were breeding lines ARSOK V85-377 and Jupiter at 5,394 and 5,280 pounds per acre, respectively, but statistically no differences were seen for yield. Differences were seen among entries for grade, which ranged from 63

to 73 percent TSMK, with the highest grade reported for ARSOK V85-7.

Table 8 shows peanut yields and grades averaged across years (2016-2017) and all locations in Oklahoma, along with estimated revenue for each entry. The top performing runner entry was breeding line ARSOK R47A with a yield of 5,675 pounds per acre and a grade of 70 percent TSMK. Flavor Runner 458 averaged 4,505 pounds per acre, making it the poorest performer overall. Among the Spanish entries, AT-9899 and OLé were the top yielders, numerically, but no statistical differences in performance were found. Breeding line ARSOK V85-377 was numerically the top yielder across locations and years, averaging 5,755 pounds per acre, but no significant differences were seen for Virginia-type entries.

The incidence of pod rot in Custer and Tillman counties was 5 percent or less in all plots, so data from these counties were not analyzed. In addition, pod rot levels in Spanish and Virginia entries in Caddo County also were too low to analyze. However, moderately low levels of pod rot were observed in the Caddo County runner entries, but differences among these entries were not statistically significant (P = 0.15; Table 9).

Table 10 shows pod brightness and size distribution values of Virginia trial entries averaged across locations for 2017. Very little difference was noted among entries, but Florida Fancy was lowest in pod brightness with a Hunter L score of 48. Industry demands on pod size distribution are strict for Virginia peanuts which are sold in-shell. Larger pods are preferred, especially for export markets. Significant differences were seen among Virginia-type entries for pod size (averaged across locations) in 2017. ARSOK V85-377 and Wynne had the largest pods (count/oz. on a 40/64 x 3-inch screen), followed by Jupiter, VENUS and Florida Fancy.

Acknowledgements

Special thanks to Lisa Myers and Angie Harting for technical support and to Bobby Weidenmaier, Harley Houston and Brennan Leighton at the Caddo Research Station for location support. Thanks also to farmer cooperators Les Crall, and Joe D. and Gayle White. Variety seed for these trials was provided by Golden Peanut and Treenut Company and Birdsong Peanuts. This research is supported by USDA-ARS CRIS Project No. 3072-21220-007-00D, the OPC and NPB, as well as Oklahoma Agricultural Experiment Station. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the USDA. USDA is an equal opportunity provider and employer.

Table 6. Yields and grades from Tillman County peanut ariety trials, 2016 and 2017 along with two-year averages and estimated revenue.[4, 5]

Variety or line	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
	--------2016--------		--------2017--------		----2-year average----		
Runner[1]							
ARSOK R47A	6,550ab	73a	6,703a	69ab	6,626a	71ab	906
Tamrun OL11	6,679a	71ab	5,650b	73a	6,164ab	72a	854
Webb	5,630b-d	64c	6,231ab	70ab	5,930a-c	67a-c	765
Lariat	5,776a-d	70a-c	5,977ab	69ab	5,876a-c	70a-c	792
ARSOK R92-13	5,566cd	68a-c	5,493b	68ab	5,529bc	68a-c	724
ARSOK R94-4	5,163d	70a-c	5,856ab	71ab	5,509bc	69a-c	732
ARSOK 90-12	5,340d	68a-c	5,493b	60c	5,416bc	64c	667
ARSOK 93-10	5,324d	68a-c	5,299cb	70ab	5,311bc	69a-c	706
Flavor Runner 458	5,727a-d	66bc	4,513c	66bc	5,120c	66bc	651
Mean	5,844	69	5,737	68	5,720	68	
CV	9.9	5.3	11.6	7.7	7.6	3.9	
LSD (0.05)	980	6.1	966	7.6	992	6.1	
Spanish[1]							
AT-9899	5,904	70a	6,667a	60b	6,285a	66	778
OLé	5,840	69b	5,917b	63ab	5,878ab	66	750
ARSOK S88-2	2,614	69b	5,965b	67a	5,789ab	68	739
Tamnut OL06	5,227	64c	5,384b	57b	5,305b	61	607
Mean	5,646	68	5,878	63	5,814	65	
CV	8.1	1.1	7.3	5.4	5.2	7.4	
LSD (.05)	Ns	1.5	663	5.2	842	ns	
Virginia[1]							
ARSOK V85-377	6,614a	67bc	6,683a	63c	6,649	65b	844
Jupiter	6,566a	67bc	6,207ab	64c	6,386	66b	823
ARSOK V85-7	5,904ab	73a	6,642a	73a	6,273	73a	894
VENUS	5,582b	65c	6,425ab	69ab	6,003	67b	786
Wynne	5,905ab	66bc	6,025b	64c	5,965	65b	757
Florida Fancy	5,889ab	67bc	5,989b	67bc	5,939	67b	777
Mean	6,124	68	6,328	67	6,202	67	
CV	7.1	3.6	6.2	4.4	5.5	2.7	
LSD (.05)	758	4.3	589	4.4	ns	4.4	

[1] Market Type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Data not shown for all varieties tested in 2013-2017 and used to calculate mean, CV and LSD.
[5] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.

Table 7. Yields and grades averaged across all locations for peanut variety trials in 2017.[4]

Variety or line	*Yield (lbs/a)*	*Percent of trial average*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
Runner[1]				
ARSOK R47A	5,175a	113	67bc	668
Lariat	4,993a	109	69a-c	663
Webb	4,953a	108	69a-c	658
Tamrun OL11	4,642ab	101	73a	652
ARSOK R92-13	4,577ab	100	66bc	582
ARSOK R94-4	4,505ab	98	68a-c	590
Georgia 09B	4,493ab	98	65c	562
ARSOK R90-12	4,307ab	94	65bc	539
ARSOK R93-10	4,259ab	93	70ab	574
Flavor Runner 458	3,875b	85	66bc	492
Mean	4,578		68	
CV	28.1		7.7	
LSD (0.05)	1,044		4.2	
Spanish[1]				
OLé	4,909	105	66ab	608
ARSOK S88-2	4,901	104	68a	625
AT-9899	4,739	101	64b	569
Tamnut OL06	4,541	97	63b	537
Schubert	4,382	93	68a	559
Mean	4,692		66	
CV	24.2		7.1	
LSD (.05)	ns		3.8	
Virginia[1]				
ARSOK V85-377	5,394	106	66bc	695
Jupiter	5,280	104	65bc	670
ARSOK V85-7	5,255	103	73a	749
Florida Fancy	5,046	99	64cd	631
VENUS	4,989	98	67b	653
Wynne	4,638	91	63d	571
Mean	5,100		66	
CV	24.1		6.3	
LSD (.05)	ns		3.4	

1 Market Type.
2 % TSMK = Percent total sound mature kernels.
3 Calculated based on peanut market-type price December 2017 (USDA-FSA).
4 Values within the same column followed by the same letter are not significantly different at P = 0.05.

Table 8. Yields and grades averaged across all peanut variety trial locations, 2016 and 2017, along with two-year averages and estimated revenue.[4, 5]

Variety or line	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Yield (lbs/a)*	*Grade[2] (% TSMK)*	*Revenue[3] ($/a)*
	--------2016--------		--------2017--------		----2-year average----		
Runner[1]							
ARSOK R47A	5,989ab	69ab	5,119	69c-e	5,675a	70	696
Tamrun OL11	6,146a	71a	4,332	78a	5,434ab	73	763
Lariat	6,122a	68ab	4,888	71b-d	5,387ab	71	737
Webb	5,493b-d	63c-e	4,997	72b-d	5,234ab	68	685
ARSOK R92-13	5,324cd	68ab	4,780	72b-d	5,076ab	68	665
ARSOK R94-4	5,324cd	60e	4,465	72a-c	4,835ab	68	633
ARSOK R90-12	5,251c-e	65b-d	4,707	73a-b	4,707ab	67	607
ARSOK R93-10	4,670e	56f	4,453	74ab	4,576ab	68	600
Flavor Runner 458	5,057de	66bc	4,537	69de	4,505b	67	581
Mean	5,844	69	4,702	71	5,047	68	
CV	9.9	5.3	15.0	3.5	18.9	6.9	
LSD (0.05)	980	6.1	ns	3.5	1110	ns	
Spanish[1]							
AT-9899	5,355a	68	4,738	63b	5,047	66	625
OLé	5,169a	66	4,908	66ab	5,038	66	624
Tamnut OL06	4,977ab	65	4,541	63b	4,759	64	571
ARSOK S88-2	4,013b	67	4,900	67a	4,456	67	560
Mean	4,879	63	471	67	4,825	66	
CV	4.4	2.4	7.2	5.7	17.0	5.4	
LSD (.05)	985	ns	ns	3.2	ns	ns	
Virginia[1]							
ARSOK V85-377	5,662ab	65bc	5,445	69b	5,755	67b	753
Florida Fancy	5,731a	63c	5,203	65c	5,433	65b	690
Jupiter	5,166b-d	63c	5,287	66bc	5,375	65b	682
ARSOK V85-7	5,203bc	72a	4,561	75a	5,301	73a	831
VENUS	5,324a-c	64c	5,094	69b	5,221	67b	683
Wynne	4,767d	63c	4,453	68bc	5,031	65b	638
Mean	5,273	65	5,007	69	5,352	67	
CV	6.5	3.5	6.1	3.5	16.9	4.6	
LSD (.05)	505	3.4	ns	3.6	ns	3.6	

[1] Market Type.
[2] % TSMK = Percent total sound mature kernels.
[3] Calculated based on peanut market-type price December 2017 (USDA-FSA).
[4] Data not shown for all varieties tested in 2013-2017 and used to calculate mean, CV and LSD.
[5] Values within the same column followed by the same letter are not significantly different at P = 0.05; NS = not significantly different.

Table 9. Pod rot in runner market-type entries, Caddo County peanut variety test, 2017.

Variety or line	*Percent pod rot*[1]
Tamrun OL11	4.0 a
Georgia-09B	3.0 a
Flavor Runner 458	2.8 a
ARSOK R94-4	2.8 a
ARSOK R92-13	1.3 a
ARSOK R93-10	1.3 a
ARSOK R90-12	0.8 a
Webb	0.3 a
ARSOK R47A	0.3 a
Lariat	0.3 a

[1] Pod rot ratings taken immediately after digging. Numbers with the same lowercase letter within each market-type are not significantly different.

Table 10. Pod brightness and distribution for virginia genotypes included in the 2017 Oklahoma peanut variety trials. Values are averaged across locations.[1]

Variety or line	*Brightness (Hunter L Score)*	*40/64 x 3"*[2] *no./oz*	*37/64 x 3"*[2] *no./oz*	*32/64 x 3"*[2] *no./oz*	*Pass through*[2] *no./oz*
Jupiter	51a	10b	12a	17bc	37cd
ARSOK V85-377	50a	9a	12a	16ab	35bc
Wynne	50a	9a	12a	18c	39d
ARSOK V85-7	50a	11c	12a	15a	32a
VENUS	50a	10b	13b	17bc	34ab
Florida Fancy	48b	10b	12a	17bc	32a
Mean	50	9.8	12.2	16.6	34.8
CV	3.1	1.2	1.1	2.3	2.7
LSD (.05)	1.7	0.8	0.4	1.0	2.8

[1] Values within the same column followed by the same letter are not significantly different at P = 0.05.
[2] Indicates the number of pods per ounce riding the indicated screen size. Pass through indicates number of pods per ounce passing through a 32/64 x 3-inch screen.

Disease Evaluations and Agronomic Traits of Advanced Peanut Breeding Lines in 2017

Rebecca S. Bennett and Kelly D. Chamberlin
USDA-ARS, Stillwater

2017 progress made possible through OPC and NPB support

- **A total of 19 breeding lines and reference cultivars (10 runner, three Spanish and six Virginia market types) were evaluated at the Caddo Research Station for yield, seed characteristics, and soilborne diseases (Sclerotinia blight, southern blight and pod rot). All advancd breeding lines were high oleic.**
- **Environmental conditions in 2017 were favorable for Sclerotinia blight. Relatively low levels of southern blight and pod rot were observed.**
- **Numerically, the top three runner entries for revenue and yield were Tamrun OL11 ($544 per acre; 4041 pounds per acre), Lariat ($478 per acre; 3,636 pounds per acre) and Webb ($472 per acre; 3,706 pounds per acre). ARSOK R47A had the highest grade of all entries at 77 percent. Tamrun OL11 had the least Sclerotinia blight at 39 percent, while Florida-07 and Webb had the most at 93 and 81 percent, respectively,**
- **Little soilborne disease was found on the Spanish entries OLé, Schubert and ARSOK S88-2. OLé had the highest crop value ($477 per acre) and yield (4,260 pounds per acre). ARSOK S88-2 had the highest grade at 67 percent.**
- **In the Virginia trial, crop value and yield were highest in Florida Fancy ($475 per acre; 3,741 pounds per acre), VENUS ($433 per acre; 3,364 pounds per acre) and ARSOK V85-377 ($417 per acre; 3,086 pounds per acre). ARSOK V85-7 had the highest grade at 78 percent. Florida Fancy and VENUS had the least Sclerotinia blight (48 and 40 percent, respectively).**
- **Pod size distribution was also evaluated for the Virginia entries. The largest super jumbo pods were found in ARSOK V85-377 and Wynne (nine pods per ounce). ARSOK V85-7 had the largest jumbo pods at 11 pods per ounce, but no differences were found among entries in the number of fancy pods per ounce. Florida Fancy had the largest pass-through pods at 23 pods per ounce.**

A major goal of the ARS peanut research program in Stillwater is to develop and release high-oleic peanut cultivars for the southwest with improved yield, disease resistance and seed characteristics. In 2017, commercial and advanced breeding lines of runner, Spanish and Virginia peanuts in small plots were evaluated at OSU's Caddo Research Station in Fort Cobb. The objectives of this field study were to compare advanced or newly released lines to commercially available cultivars in agronomic quality (e.g., yield and seed grade) and disease resistance to soilborne diseases.

Methods and Field Conditions

A total of 19 breeding lines and reference cultivars (10 runner, three Spanish and six Virginia market types) were evaluated. The three peanut market types were grown and evaluated separately, and all advanced breeding lines were high oleic. Each breeding line or cultivar was planted at a density of five seeds per foot in plots consisting of two 15-foot-long rows with 36-inch beds. A randomized complete block design was used by dividing the field into four sections to account for potential disease gradients and environmental variables. Each breeding line or cultivar was planted once in each section for all market types except for the Spanish study, which had additional replications. Plots were planted May 17. Plots were inoculated with pure sclerotia of *Sclerotinia minor* at a rate of 0.5 gram per 15-foot row Sept. 5. The field was managed for weeds, foliar diseases and southern blight, but was not managed for Sclerotinia blight, pod rot or nematodes.

Environmental conditions were fairly conducive for Sclerotinia blight from August to October, the months during which this disease usually occurs (Table 11). Daily average temperatures in August, September and October were 76.6, 72.1 and 62.0 F, respectively. Rainfall was notably greater than the 15-year average in August (4.03 inches), September (1.24 inches) and October (1.17 inches). Additional water (0.5 to 1 inch) was applied to the plots 16 times between June 5 and Oct. 9 using a center pivot system.

Disease evaluations for Sclerotinia and southern blights were conducted on Sept. 11 and 21 for the Spanish entries, and Sept. 11 and Oct. 12 for the runner and Virginia entries. Disease incidence was measured by counting the number of 6-inch sections within each plot that had symptoms of Sclerotinia blight, caused by *Sclerotinia minor*, and southern blight, caused by *Sclerotium rolfsii*. Little southern blight was observed. In addition, the area lost to the center pivot's irrigation tracks was estimated in affected plots on the last rating date. Spanish plots were dug Oct. 2 and threshed Oct. 3; runner and Virginia plots were dug Oct.30 and threshed Nov. 2. For the runner and Virginia plots, pod rot ratings were taken within five hours of digging by estimating the percentage of discolored pods. Pod rot damage was minimal and no greater than 5 percent

Table 11. Monthly air temperature and rainfall for field season, Caddo Research Station, 2017.[1]

	Air temperature (F)		*Rainfall (inches)*	
Month	*Daily mean*	*Departure from 15-year average*	*Total*	*Departure from 15-year average*
May[2]	69.6	-1	0.28	-1.53
June[3]	77.7	-1	2.40c	-1.95
July[3]	82.1	+1	2.78	+0.13
August	76.6	-4	7.06	+4.03
September[3]	72.1	0	3.28	+1.24
October[2]	62.0	0	4.02	+1.17

[1] Data from Mesonet.
[2] Mean temperature and rainfall are for May 17 (planting date) to May 31 and Oct. 1 to 30 (last digging date). Departure from 15-year average includes all days in May and October.
[3] Incomplete records or data unavailable.

in each of the runner plots, so statistical analyses were conducted only for the Virginia entries. Peanut grades were determined following USDA-AMS guidelines, using two to three 200-gram samples from each plot. One 500-gram sample per plot was used to determine pod size distribution in the Virginia entries. Pods were presorted prior to shelling, and all sound mature kernels from grade samples were assessed for visible damage. Yield was adjusted in plots affected by wheels from the center pivot by factoring in the percent of the plot area lost. Data were analyzed using one-way ANOVA in PROC GLIMMIX of SAS (ver. 9.3). The Type I error rate for pairwise comparisons of breeding lines and cultivars was controlled at $P = 0.05$ using the Tukey-Kramer adjustment.

Performance of the Advanced Runner-Type Breeding Lines and Cultivars in 2017

Ten runner peanut entries, including the high-oleic cultivars Florida-07, Georgia-09B, Lariat, Tamrun OL11 and Webb were evaluated (Tables 12 and 13). Statistical differences among entries were found in both early and late Sclerotinia ratings. In the early rating, Florida-07 had the most Sclerotinia blight at 38 percent. By the late rating, Florida-07 and Webb had the most Sclerotinia blight at 93 and 81 percent, respectively, while Tamrun OL11 had the least disease at 39 percent (Table 12).

Statistical differences were found among runner entries for crop value, yield and all shelling characteristics (Table13.) Numerically, the top three runner entries for revenue and yield were Tamrun OL11 ($544 per acre; 4,041 pounds per acre), Lariat ($478 per acre; 3,636 pounds per acre) and Webb ($472 per acre; 3,706 pounds per acre). Entries with the lowest crop value and yield were Florida-07 ($360 per acre; 2,879 pounds per acre) and ARSOK R90-12 ($382 per acre; 2,844 pounds per acre). Breeding line ARSOK R47A had the highest grade at 77 percent, followed by ARSOK R90-12, Tamrun OL11 and ARSOK R92-13, all at 76 percent. ARSOK R92-13 had the largest seed size at 76 grams per 100 seeds, while the smallest seeds were found in Florida-07 (61 grams), Georgia-09B (62 grams) and ARSOK R93-10 (63 grams). The greatest percentage of jumbo pods was found in Georgia-09B and ARSOK R92-13, both at 48 percent. The lowest was found in Florida-07 and AROSK R93-10 (32 and 35 percent, respectively). ARSOK R47A had the fewest visibly damaged kernels (0.2 percent) and smallest hull percentage (21 percent).

Performance of the Advanced Spanish-Type Breeding Lines and Cultivars in 2017

Little soilborne disease was found on the Spanish entries OLé, Schubert and ARSOK S88-1, and no significant differences were observed in disease ratings (Table 12). Significant differences were found for crop value, yield, grade and percentages of jumbo and visibly damaged kernels (Table 13). The Spanish entries did not differ in seed size (grams per 100 seeds) or hull percentage. OLé had the highest crop value ($477 per acre) and yield (4,260 pounds per acre). The grade of ARSOK S88-2 (67 percent) was higher than Schubert (62 percent). Schubert had the fewest jumbo kernels (19 percent) and the most visibly damaged kernels (1 percent).

Table 12. Sclerotinia blight, southern blight and pod rot in runner, Spanish and Virginia advanced breeding lines and commercial cultivars, Caddo Research Station, 2017.[1]

Variety or line	*Sclerotinia[2] (early rating)*	*Sclerotinia (late rating)*	*Southern[2] (early rating)*	*Southern (late rating)*	*Pod Rot[3]*
Runner					
ARSOK R47A	10.0b	55.0cd	0.8a	—	—
ARSOK R90-12	15.4b	60.8b-d	4.2a	—	—
ARSOK R92-13	17.5b	60.0b-d	1.7a	—	—
ARSOK R93-10	6.7b	50.8cd	0.4a	—	—
ARSOK R94-4	17.1b	64.2bc	1.3a	—	—
Florida-07	38.3a	92.5a	0.8a	—	—
Georgia-09B	12.9b	68.8bc	2.5a	—	—
Lariat	8.8b	53.3cd	0.0a	—	—
Tamrun OL11	3.8b	38.8d	0.8a	—	—
Webb	15.4b	81.3ab	0.4a	—	—
Spanish					
ARSOK S88-2	3.3a	5.0a	3.0a	6.6a	—
OLé	2.1a	6.0a	0a	1.6a	—
Schubert	2.7a	11.9a	0.3a	2.3a	—
Virginia					
ARSOK V85-377	6.7a	60.4ab	1.3b	1.7b	1.3b
ARSOK V85-7	4.2a	75.0a	0.8b	2.5b	1.8b
Florida Fancy	8.8a	48.3b	1.7ab	2.1b	17.5a
Jupiter	7.5a	63.3ab	6.3a	10.8a	7.8ab
VENUS	3.3a	39.6b	0.8b	1.3b	0.8b
Wynne	2.5a	54.6ab	0.4b	0.4b	4.5b

[1] Market types were analyzed separately. Numbers with the same lowercase letter within columns for each market type are not significantly different (P = 0.05). Ratings not taken due to low levels of disease.

[2] Early ratings conducted Sept. 9. Late ratings conducted Sept. 21 for Spanish and Oct. 12 for runners and Virginias.

[3] Pod rot ratings conducted within five hours of digging.

Table 13. Yield, grade, shelling characteristics and incidence of Sclerotinia blight in advanced runner and Spanish breeding lines and commercial cultivars at the Caddo Research Station, 2017.[1]

Variety or line	*Revenue ($/a)[2]*	*Yield (lbs/a)*	*Grade[3]*	*100-Seed (g)*	*ELK (%)[4]*	*VDK (%)[4]*	*Hull (%)*	*Sclerotinia late (%)[5]*
Runner								
Tamrun OL11	544a	4,041a	75.9ab	68.8ab	40ab	0.7ab	21.9cd	38.8d
Lariat	478ab	3,636ab	75.4ab	67.7ab	41ab	0.4ab	22.5b-d	53.3cd
Webb	472ab	3,706ab	72.3bc	68.3ab	40ab	0.5ab	24.8a	81.3ab
Georgia-09B	466ab	3,516ab	74.9a-c	62.1b	48a	0.8ab	22.2b-d	68.8bc
ARSOK R92-13	461ab	3,436ab	75.9ab	75.8a	48a	0.5ab	22.0cd	60.0b-d
ARSOK R93-10	456ab	3,521ab	74.5a-c	63.0b	35b	1.2a	23.1a-d	50.8cd
ARSOK R47A	452ab	3,291ab	77.2a	69.5ab	40ab	0.2b	21.0d	55.0cd
ARSOK R94-4	432ab	3,372ab	73.8a-c	68.9ab	40ab	0.7ab	23.6a-c	64.2bc
ARSOK-R90-12	382b	2,844b	76.0ab	68.6ab	37ab	0.4ab	21.7cd	60.8b-d
Florida-07	360b	2,879b	71.1c	61.4b	32b	0.7ab	24.4ab	92.5a
Spanish								
OLé	477a	4,260a	65.6ab	44.1a	29a	0.5b	30.3a	6.0a
ARSOK-S88-2	432ab	3,687b	67.4a	41.9a	29a	0.4b	28.4a	5.0a
Schubert	385b	3,519b	62.3b	43.9a	19b	1.0a	32.0a	11.9a

[1] Market types were analyzed separately. Numbers with the same lowercase letter within columns for each market type are not significantly different (P = 0.05).
[2] Based on the 2017 USDA peanut loan rate: runner, $354.32/ton; Spanish, $343.60. Calculations do not include deductions for excess splits or damaged and other kernels.
[3] Grade = % total sound mature kernels + sound splits.
[4] ELK, percentage of seeds riding largest screen: runner, 21/64 screen; Spanish, 19/64. VDK, kernels with visible damage.
[5] Incidence of Sclerotinia blight at the last rating date, Sept. 21 for Spanish and Oct. 12 for runners.

Performance of the Advanced Virginia-Type Breeding Lines and Cultivars in 2017

A total of six Virginia peanut entries were evaluated, including Jupiter, and high-oleic Florida Fancy, VENUS and Wynne (Tables 12 and 14). Significant differences were found among entries for all disease ratings except the early Sclerotinia rating (Table 12). In the late Sclerotinia rating, the most disease was found on ARSOK V85-7 (75 percent), and the least disease was on Florida Fancy and VENUS (48 and 40 percent, respectively). Jupiter was most affected by southern blight in both the early (6 percent) and late (11 percent) rating dates. Florida Fancy had the most pod rot at 18 percent, which was significantly higher than other entries, except Jupiter (8 percent).

The Virginia entries differed statistically in all agronomic qualities except the number of fancy pods per ounce and hull percentage (Table 14). The crop value and yield of Florida Fancy ($475 per acre; 3,741 pounds per acre), VENUS ($433 per acre; 3,364 pounds per acre) and ARSOK V85-377 ($417 per acre; 3,086 pounds per acre) were significantly higher than Jupiter and AROSK V85-7. In seed grade, ARSOK V85-7 had the highest grade (78 percent) of all entries, surpassing the next highest, ARSOK V85-377, by 5 percent. Florida-07 had the lowest grade at 71 percent.

Significant differences were found in pod size distribution for super jumbo, jumbo and pass-through categories (Table 14). The largest super jumbo pods were found in ARSOK V85-377 and Wynne (nine pods per ounce), which was significantly greater than Jupiter and VENUS (11 and 10 pods per ounce, respectively). In jumbo pods, ARSOK V85-7 had the largest at 11 pods per ounce, and VENUS had the smallest at 12 pods per ounce. The largest pass-through pods were in Florida Fancy and ARSOK lines V85-377 and V85-7 (23, 24 and 25 pods per ounce, respectively). Wynne had the smallest pass-though pods (32 pods per ounce).

ARSOK V85-377, ARSOK V85-7 and VENUS had the highest percentage of fancy pods at 95 percent, while Florida Fancy had the fewest (84 percent). The biggest seeds were found in Wynne at 100 grams per 100-seed, which was significantly larger than VENUS (83 grams per 100 seeds). ARSOK V85-7 had the most extra large kernels at 62 percent; Florida Fancy had the fewest (36 percent). The most and least visibly damaged kernels were found in Jupiter (1.6 percent) and VENUS (0.7 percent), respectively.

Average Performance over the Past Three Years (2015-2017)

The past three seasons have differed considerably in environmental conditions, most notably the low levels of Sclerotinia blight in 2015 due to above-average fall temperatures. When data from 2015 to 2017 were averaged, significant differences were found among the runner entries Florida-07, Lariat, Tamrun OL11 and ARSOK R47A only in incidence of Sclerotinia blight and yield (Table 25). Florida-07 had the most disease (54 percent) and lowest yield (3932 pounds per acre). Between the Spanish entries OLé and ARSOK S88-2, statistically significant differences were only found for yield. OLé produced an average of 4,200 pounds per acre, while ARSOK S88-2 produced 3,890 pounds per acre. For the Virginia entries Florida Fancy, Jupiter, VENUS and ARSOK V85-7, differences were found in incidence

Table 14. Yield, grade, shelling characteristics, and incidence of Sclerotinia blight in advanced Virginia breeding lines and commercial cultivars at the Caddo Research Station, Fort Cobb in 2017.[1]

Variety or line	*Revenue ($/a)[2]*	*Yield (lbs/a)*	*Grade[3]*	*Super Jumbo (no./oz)[4]*	*Jumbo (no./oz)[4]*	*Fancy (no./oz)[4]*	*Pass Through (no./oz)[4]*	*Fancy Pods (%)[5]*	*100-Seed (g)*	*ELK (%)[6]*	*VDK (%)[6]*	*Hull (%)*	*Sclerotinia late (%)[7]*
Virginia													
Florida Fancy	475a	3,741a	69.8b	9.8bc	11.6ab	12.2a	23.2b	84.4b	84.8ab	36d	0.9ab	27.9a	48.3b
VENUS	433a	3,364a	70.8b	10.4ab	12.1a	16.3a	29.3ab	94.9a	83.4b	41cd	0.7b	32.7a	39.6b
ARSOK V85-377	417a	3,086a	73.4b	9.0d	11.3ab	13.8a	24.0b	95.2a	87.1ab	53b	0.7ab	31.6a	60.4ab
Wynne	369ab	2,938ab	69.9b	9.1cd	11.4ab	16.8a	32.0a	93.1ab	100.3a	48bc	0.8ab	28.6a	54.6ab
ARSOK V85-7	279b	2,178bc	77.8a	9.9bc	11.1b	14.2a	24.7b	94.5a	91.1ab	62a	0.8ab	21.5a	75.0a
Jupiter	278b	1,997c	69.9b	10.8a	11.4ab	15.1a	28.0ab	93.7ab	90.6ab	49b	1.6a	32.8a	63.3ab

[1] Numbers with the same lowercase letter within columns for each market type are not significantly different (P = 0.05).
[2] Based on the 2017 USDA peanut loan rate per ton for Virginia ($360.46). Calculations do not include deductions for excess splits or damaged and other kernels.
[3] Grade = % total sound mature kernels + sound splits.
[4] Number of pods per ounce for pods riding slotted screens sized for super jumbo (40/64 x 3" slots), jumbo (38/64 x 3"), fancy (32/64 x 3"). Pass-through pods fit through the 32/64 x 3" screen.
[5] Percentage of Virginia pods that ride the 34/64-inch spacing on presizer.
[6] ELK, percentage of seeds riding 21.5/64 screen. VDK, kernels with visible damage.
[7] Incidence of Sclerotinia blight at the last rating date, Oct. 12.

Table 15. Three-year averages for incidence of Sclerotinia blight, yield, and seed grade in advanced breeding lines and commercial cultivars, Caddo Research Station.[1]

	2015-2017			2015			2016			2017		
Entry	*SM*	*Yield*	*Grade[2]*	*SM*	*Yield*	*Grade*	*SM*	*Yield*	*Grade*	*SM*	*Yield*	*Grade*
Runner												
Florida-07	54.0a	3,932b	69.8a	15.0a	3,884a	74.8ab	54.6a	5,034a	63.4b	95.5a	2,879a	71.1b
Lariat	23.1b	4,576a	72.7a	4.2b	4,296a	76.1a	11.7b	5,797a	66.8ab	53.3b	3,636ab	75.4a
Tamrun OL11	21.9b	4,641a	72.5a	3.3b	4,513a	71.2b	23.8b	5,370a	70.3a	38.8c	4,041a	75.9a
ARSOK 47A	24.4b	4,591a	72.3a	2.9b	4,622a	70.9b	15.4b	5,858a	68.9a	55.0b	3,291ab	77.2a
Spanish												
OLé	2.6a	4,200a	66.6a	0	3,267a	69.2a	0.8a	5,058a	65.3a	6.0a	4,254a	65.6a
ARSOK S88-2	2.4a	3,890b	67.7a	0	3,182a	70.6a	1.7a	4,852a	65.2a	5.0a	3,693b	67.4a
Virginia												
Florida Fancy	30.3ab	4,550a	66.2b	4.2a	4,477a	66.7c	38.3ab	5,433a	62.1b	48.3bc	3,741a	69.8b
Jupiter	40.8a	3,771b	67.9b	7.5a	4,054ab	69.1bc	51.7a	5,082a	64.6b	63.3ab	2,178b	69.9b
VENUS	18.5b	4,098ab	67.4b	2.1a	3,557b	70.5b	13.8b	5,372a	60.8b	39.6c	3,363a	70.7b
ARSOK V85-7	29.3ab	4,005b	75.0a	0.8a	3,545b	74.3a	20.6b	5,239a	74.1a	75.0a	1,997b	77.7a

[1] SM, incidence of Sclerotinia blight at the last rating date.
2 Percent total sound mature kernels + sound splits.

of Sclerotinia blight, yield and grade. The most disease was found in Jupiter (41 percent), while VENUS had the least disease (19 percent). Florida Fancy produced the highest yields (4,550 pounds per acre) over the three years, which was significantly higher than Jupiter and ARSOK V85-7 (3,772 and 4,005 pounds per acre, respectively). ARSOK V85-7 had the highest seed grade at 75 percent of all the entries.

Acknowledgements

We thank A. Harting and L. Myers at USDA-ARS, and R. Weidenmaier, H. Houston and B. Leighton at the Caddo Research Station, for invaluable technical support. Seed for several commercial lines were provided by Golden Peanut Company or Birdsong Peanuts. This research is supported by USDA-ARS CRIS Project No. 3072-21220-007-00D. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the USDA, which is an equal opportunity provider and employer.

Integrated Management of Peanut Diseases

John Damicone, Brenda Anaya, Ross Dees and Brooke King
Department of Entomology and Plant Pathology

2017 progress made possible through OPC and NPB support

- **Levels of soilborne diseases such as Sclerotinia blight and pod rot were low in 2017.**
- **Foliar diseases such as early leaf spot and web blotch, and the soilborne disease southern blight (*Sclerotium rolfsii*) were severe in 2017.**
- **Control of early leaf spot and web blotch resulted in yield responses of 1,000 to 1,500 pounds per acre.**
- **Miravis, an experimental fungicide that is anticipated to be registered for use on peanuts in 2018, provided superior control of foliar diseases, but required tank mixing with Elatus for control of southern blight.**
- **Of the commercially available peanut varieties, the runner variety Lariat and the Spanish variety OLé were the most resistant to Sclerotinia blight, while Georgia 09B and Jupiter were the most susceptible.**
- **The fungicides Miravis + Elatus provided control of Sclerotinia blight equivalent to Omega or Endura, although disease pressure was low.**

Field trials were completed in 2017 that addressed the management of important peanut diseases in Oklahoma. The management strategies that were evaluated included chemical control, biological control and disease-resistant varieties. Efforts were made to develop and demonstrate a range of input levels for the fungicide programs. The diseases studied included early leaf spot, web blotch, southern blight and Sclerotinia blight. The excellent cooperation of Bobby Weidenmaier and the staff at the Caddo Research Station is greatly appreciated. Additional funding for the trials was provided by BASF, Bayer, DuPont and Syngenta.

Results from 2017 are summarized in this report. In interpreting the results, small differences in treatment values should not be overemphasized. Statistical analysis at the 95 percent confidence level is applied to all the trial data. Unless values are statistically different (followed by different letters), little confidence can be placed in the superiority of one treatment or variety over another.

Conditions were generally favorable for development of the peanut crop and diseases. Most of the trials at the Caddo Research Station were planted May 10. Rainfall during the cropping period (May 10 to Oct. 30) totaled 2.91 inches for May, 2.4 inches for June, 2.78 inches for July, 7.06 inches for August, 3.28 inches for September and 4.02 inches for October. Plots received 14 applications of sprinkler irrigation at 0.5 to 1 inch per application that totaled 9.0 inches of water. Compared to the 30-year average, rainfall was nearly 3 inches above normal for the cropping period of May through October. Monthly rainfall totals were below normal for May and June and were

above normal from for the remaining months. Average daily temperature was below normal each month and was nearly 6 F below normal for August. The cool, wet conditions in August favored foliar disease development. Web blotch was unusually severe in 2017 on Spanish varieties. Pod rot was a minor concern while levels of Sclerotinia blight and southern blight were somewhat below normal. Southern blight pressure was extreme when inoculated with *Sclerotium rolfsii*.

Sclerotinia blight

Variety Responses to Fungicide Programs

The objective of this trial was to measure the disease and yield responses of peanut varieties that were commercially available in 2017 to various levels of fungicide input for Sclerotinia blight. Varieties included Jupiter (susceptible Virginia), Lariat and Tamrun OL11 (resistant runners), Georgia 09B (intermediate runner) and OLé (resistant Spanish). The high-input treatment consisted of two preventive applications. The low-input treatment was a single application made at the first appearance of disease (demand). The trial was planted May 10 and dug Oct. 30.

Sclerotinia blight appeared in August, but only reached low levels compared to previous trials at this site. The low disease incidence was attributed to reduced plant growth in which the vines did not cover the ground in between rows. Fungicides reduced Sclerotinia blight on all varieties except Lariat and OLé, which had the lowest levels of disease (Table 16). There were no differences in disease control between the preventive and demand programs on any of the varieties. Disease levels were highest for Jupiter and Georgia 09B. Yield and crop value were highest for Lariat, Georgia 09B and Tamrun OL11. Fungicides increased yields above the untreated check for all varieties. However, crop value responses were below those observed in the past and generally not sufficient to offset treatment costs.

Evaluation of Fungicides and Biologicals for Control of Sclerotinia blight

The objective of this trial was to evaluate fungicides and biologicals (Oso, Double Nickel) for control of Sclerotinia blight on the susceptible variety Florida Fancy. Treatments were applied twice on a preventive schedule approximately four weeks apart. The trial was planted May 10 and dug Oct. 30.

The vines never lapped between rows and despite the cool rainy weather in August, Sclerotinia blight only reached 25 percent in the non-treated check by harvest (Table 17). All treatments except Oso and Double Nickel reduced disease incidence compared to the nontreated check. All treatments except Oso, Double Nickel alone and Fontelis had higher yields than the nontreated check. Because of the low disease pressure, yield and value responses barely offset treatment costs.

Foliar Diseases

Evaluation of Fungicide Programs

The objective of this trial was to evaluate fungicide programs applied on various schedules for control of foliar diseases on the variety OLé. Fungicides were applied on a full-season 14-day schedule that totaled six sprays, on a 3-spray reduced 14-day program and according to the weather-based Peanut Leaf Spot Advisor program on the Oklahoma MESONET (http://www.mesonet.org). Treatments included the

Table 16. Responses of peanut varieties to fungicide programs for control of Sclertotinia blight.

Treatment and rate/a (timing)[1]	*Lariat*	*Jupiter*	*Georgia 09B*	*OLé*	*Tamrun OL11*	*Average*[2]
Sclerotinia blight (%) - Oct. 12						
Omega 4F 1.0 pt (P1,P2)	0.5a[3]	5.0b	2.7b	0.0a	1.0b	1.8
Omega 1.5 pt (D)	0.2a	4.7b	2.2b	0.0a	1.2b	1.7
Endura 70WG 8 oz (P1+P2)	0.5a	3.2b	1.5b	0.0a	0.5b	1.1
Endura 70WG 10 oz (D)	0.2a	2.2b	0.7b	0.0a	1.7b	1.0
Untreated check	1.5a	11.0a	10.2a	0.0a	6.5a	5.8
Average4	0.6	5.2	3.5	0.0	2.2	
Yield (lb/a)						
Omega 4F 1.0 pt (P1,P2)	4,456	3,751	4,320	3,703	4,447	4,135a[3]
Omega 1.5 pt (D)	4,438	3,276	4,274	3,439	4,519	3,989a
Endura 70WG 8 oz (P1+P2)	4,519	4,002	4,501	3,439	4,528	4,198a
Endura 70WG 10 oz (D)	4,474	3,893	4,383	3,367	4,565	4,136a
Untreated check	4,184	2,967	3,984	3,185	3,957	3,655b
Average[4]	4,414a[3]	3,578b	4,292a	3,427b	4,403a	
Value ($/a)[5]						
Omega 4F 1.0 pt (P1,P2)	786	638	775	624	801	725a[3]
Omega 1.5 pt (D)	783	558	767	580	814	700a
Endura 70WG 8 oz (P1+P2)	797	681	808	580	816	736a
Endura 70WG 10 oz (D)	789	663	787	568	822	726a
Untreated check	738	505	715	537	713	642b
Average[4]	778a[3]	609b	770a	578b	793a	

[1] P1 and P2 are preventive applications on Aug. 2 and Aug. 31, respectively; D is the demand application on Aug.16.
[2] Averaged over variety.
[3] Values in a column or row followed by the same letter are not statistically different at P = 0.05.
[4] Averaged over fungicide treatment.
[5] 2017 loan rate value based on an average grade (% TSMK) of 72 for Lariat, 67 (31% ELK) for Jupiter, 73 for Georgia 09B, 70 for OLé and 73 for Tamrun OL11.

registered fungicides Folicur + Bravo, Headline + Alto and the experimental fungicide Mirivis + Alto. The trial was planted May 10 using strip till techniques and dug Oct. 17.

Cool, rainy weather in August favored foliar disease development, which reached severe levels compared to previous trials at this site. Early leaf spot appeared in August and reached 90 percent incidence and caused over 50 percent defoliation Sept. 14 (Table 18). Defoliation reached 100 percent in the non-treated check by harvest. All treatments reduced early leaf spot and had low defoliation levels Sept. 14. Web blotch appeared in September and was highest for Folicur, and Headline + Alto programs, and lowest for Miravis + Alto programs. Web blotch also was low in the non-treated check because nearly all leaves had early leaf spot by the time web blotch began to develop. By Oct. 12, defoliation increased to high levels in the Folicur + Bravo and Headline + Alto programs. Miravis + Alto programs provided the best disease control. The increase in defoliation from Sept. 14 and

Table 17. Evaluation of fungicides and biological for control of Sclerotinia blight on Florida Fancy Virginia-type peanuts.

Treatment and rate/a (timing)[1]	*Sclerotinia blight (%)*		*Yield (lbs/a)*	*Value ($/a)*[2]
	Sept. 14	*Oct. 12*		
Omega 4F 1.0 pt (1,2)	2.0de[3]	7.0bc	4,516bc	809bc
Endura 70WG 8 oz (1,2)	1.0e	5.7c	4,617abc	827abc
Oso 6.5 fl oz + Induce 0.25% (1,2)	9.2a	28.0a	4,363bcd	782bcd
Double Nickel LC 1 qt (1,2)	7.2abc	24.2a	4,327cd	775cd
Double Nickel LC 1 qt (1) Omega 4F 1 pt (2)	7.0abc	14.0b	4,690abc	840abc
Elatus 45WG 7.3 fl oz + Miravus 1.67F 3.42 fl oz (1,2)	2.5de	8.2bc	4,980a	892a
Propulse 3.3F 13.7 fl oz (1,2)	5.2bcd	11.2bc	4,675abc	837abc
Fontelis 1.67F 1.5 pt (1,2)	3.2de	10.0bc	4,472bcd	801bcd
Priaxor 4.17F 8 fl oz (1,2)	5.0cd	9.2bc	4,770ab	854ab
Non-treated check	8.5ab	25.2a	4,080d	731d

[1] Applications 1 and 2 refer to preventive applications on Aug. 2 and Aug. 31, respectively.
[2] 2017 loan rate value based on an average grade 70% TSMK and 36% ELK.
[3] Values in a column followed by the same letter are not statistically different at P = 0.05.

Oct. 12 was likely due to web blotch. Within each fungicide treatment, disease control was similar among the full-season, leaf spot advisor and reduced calendar programs. All treatments increased yield compared to the nontreated check by over 1,050 pounds per acre and increased crop value by at least $175 per acre.

Foliar Diseases and Southern Blight

Evaluation of Fungicide Programs

The objective of this trial was to evaluate fungicide programs for control of foliar and soilborne diseases of peanuts. All fungicides tested except Miravis are registered for use on peanuts. The full-season Bravo program controls foliar diseases but not soilborne diseases such as southern blight. Plots were inoculated with the southern blight fungus by sprinkling millet seed colonized by the fungus along the center two rows of each plot July 26 after the second fungicide application. The foliar diseases early leaf spot and web blotch developed naturally. The trial was planted May 10 using strip till techniques and dug Oct. 17.

Cool rainy weather in August favored foliar disease development which reached severe levels compared to previous trials at this site. Early leaf spot appeared in the non-treated check in August and reached nearly 90 percent incidence and over 60 percent defoliation Sept. 14 (Table 19). Defoliation reached nearly 100 percent by harvest in the nontreated check (Table 19). All treatments reduced early leaf spot and had low defoliation Sept. 14. Web blotch appeared in September and was highest for Folicur, Abound and full-season Bravo treatments; and lowest for treatments receiving Miravis. Web blotch also was low in the nontreated check because nearly all leaves had severe early leaf spot when web blotch appeared. Defoliation increased to high levels for the Folicur and full-season Bravo treatments, which did not differ from the non-treated check by Oct. 12. Plots receiving Miravis provided the best foliar disease control. The increase in defoliation from Sept. 14

Table 18. Evaluation of fungicide programs on control of early leaf spot and web blotch on OLé Spanish-type peanuts.

	Sept. 14			Oct. 12			
Treatment and rate/a (timing)[1]	*Early leaf spot (%)*	*Web blotch (%)*	*Defoliation (%)*	*Foliar disease (%)*[2]	*Defoliation (%)*	*Yield (lbs/a)*	*Value ($/a)*[3]
Bravo 6F 1.5 pt (1,6) Folicur 3.6F 7.2 fl oz (2-5)	19.1bcd[4]	11.7ab	2.9b	95.8 a	79.1 b	3,630d	606d
Bravo 6F 1 pt + Folicur 3.6F 7.2 fl oz (A1-A4)	12.7de	3.7cd	1.2b	96.7a	76.7bc	4,058abc	677abc
Bravo 6F 1 pt + Folicur 3.6F 7.2 fl oz (3-5)	24.6bc	1.7cd	5.0b	92.1a	63.3c	3,840bcd	641bcd
Headline 2.09E 6 fl oz (1, 3, 5) Alto 0.83F 5.5 fl oz (2, 4, 6)	1.2ef	7.9bc	0.0b	95.0a	80.0b	3,811d	636d
Headline 2.09E 6 fl oz (A1, A3) Alto 0.83F 5.5 fl oz (A2, A4)	2.5ef	16.2a	0.0b	97.5a	86.2ab	3,928a-d	656a-d
Headline 2.09E 6 fl oz (3, 5) Alto 0.83F 5.5 fl oz (4)	27.5b	5.0cd	2.1b	94.6a	80.0b	3,703d	618d
Miravis 1.67F 3.4 fl oz (1, 3, 5) Alto 0.83F 5.5 fl oz (2, 4, 6)	1.0f	0.0d	0.0b	25.0c	10.0d	4,174ab	697ab
Miravis 1.67F 3.4 fl oz (A1, A3) Alto 0.83F 5.5 fl oz (A2, A4)	2.5ef	3.7cd	0.0b	31.6bc	18.3d	3,935a-d	657a-d
Miravis 1.67F 3.4 fl oz (3, 5) Alto 0.83F 5.5 fl oz (4)	14.1cd	2.1cd	2.9b	40.4b	23.3d	4,196a	700a
Non-treated check	95.4a	3.1cd	56.6a	100.0a	100.0a	2,585e	431e

[1] 1 to 6 correspond to the spray dates of 1=June 28, 2=July 12, 3=July 26, 4=Aug. 9, 5=Aug. 22 and Sept. 8 for the calendar programs; A1 to A4 correspond to the spray dates of A1=July 28, A2=July 12, A3=Aug. 2, and A4=Aug. 22 for the weather-based Leaf Spot Advisor program.

[2] Early leaf spot and web blotch were rated together.

[3] 2017 loan rate value based on an average grade 69%TSMK.

[4] Values in a column followed by the same letter are not statistically different at P = 0.05.

Table 19. Evaluation of fungicide programs for control of foliar diseases and southern blight (*Sclerotium rolfsii*) on OLé Spanish peanuts.

	Sept. 14			Oct. 12				
Treatment and rate/a (timing)[1]	*Early leaf spot (%)*	*Web blotch (%)*	*Defoliation (%)*	*Foliar disease (%)*[2]	*Defoliation (%)*	*So. blight (%)*	*Yield (lb/a)*	*Value ($/a)*[3]
Alto 0.83 SL 5.5 fl oz + Bravo 6F 1.5 pt (1) Elatus 45WG 7.3 oz + Miravis 1.67F 3.4 fl oz (2,4) Bravo 6F 1.5 pt (5)	0.4e4	0.0d	0.0d	12.9d	4.1e	12.0ef	3,347a	502a
Alto 0.83 SL 5.5 fl oz + Bravo 6F 1 pt (1) Miravus 1.67F 3.4 fl oz (2,4) Bravo 6F 1.5 pt (5)	0.4e	0.0d	0.0d	13.7d	3.3e	41.7a	1,299d	195d
Alto 0.83 SL 5.5 fl oz + Bravo 6F 1 pt (1) Omega 4F 1.0 pt + Miravis 1.67F 3.4 fl oz (2,4) Bravo 6F 1.5 pt (5)	0.0e	0.0d	0.0d	6.2d	0.0e	20.2cd	1,779c	267c
Bravo 6F 1.5 pt (1,5) Provost 3.6F 8 fl oz (2, 3,4)	9.2de	5.4cd	2.1d	80.8b	53.7bc	11.2f	2,476b	371b
Bravo 6F 1.5 pt (1, 3,5) Abound 2.08F 18.5 fl oz (2,4)	12.5d	10.0bc	1.2d	86.7ab	67.5b	11.7ef	2,621b	393b
Bravo 6F 1.5 pt (1, 3,5) Fontelis 1.67F 1 pt (2,4)	12.8d	0.0d	1.2d	61.7c	35.8d	14.5def	2,592b	389b
Bravo 6F 1.5 pt (1,3,5) Priaxor 4.17F 6 fl oz (2,4)	2.8de	2.5cd	0.0d	63.3c	40.8cd	24.2c	1,786c	268c
Bravo 6F 1.5 pt (1,5) Folicur 3.6F 7.2 fl oz (2 3,4)	33.7c	25.0a	10.0c	97.5a	83.3a	12.2ef	2,238b	335b
Bravo 6F 1.5 pt (1-5)	48.3b	16.2b	17.5b	98.7a	86.6a	31.0b	1,241d	186d
Non-treated check	89.6a	3.1cd	62.9a	100.0a	93.7a	18.0cde	915d	137d

[1] 1 to 5 correspond to the spray dates of 1 = June 28, 2 = July 12, 3 = July 26, 4 = Aug. 9 and 5 = Aug. 22

[2] Early leaf spot and web blotch were rated together.

[3] 2017 loan rate value based on an average grade 61%TSMK.

[4] Values in a column followed by the same letter are not statistically different at P = 0.05.

to Oct. 12 was likely due to web blotch. Southern blight was severe and was highest for plots receiving Miravis alone on the second and fourth applications. Elatus+ Miravis, Provost, Abound and Folicur provided the best southern blight control. All treatments except Miravis alone on the second and fourth applications, and the full-season Bravo program increased yield and crop value compared to the non-treated check. Elatus + Miravis had the highest yield and crop value, while Provost, Abound, Fontelis and Folicur were intermediate. The low average grade and resulting crop values were attributed to severe southern blight because an adjacent trial that had very low southern blight graded a more typical 69 percent TSMK.

2017 Peanut Weed Science Report

Todd Baughman
Institute for Agricultural Biosciences, Ardmore

Peanut weed management trials were conducted at Caddo Research Station near Fort Cobb in 2017. Peanut were planted in early May. Cool temperatures slowed peanut growth early in the season and likely attributed to some of the herbicide injury observed. While peanut maturity was delayed along with harvest, peanut yield exceeded 5,000 pounds per acre in 2017.

Trial PFCS17-01 evaluated various weed management programs with Zidua (pyroxasulfone) in peanut. Peanut stand reduction and injury was 5 percent or less season long with all treatment combinations except for leaf burn from paraquat. This injury from paraquat was transient in nature and was not observed later in the season. Texas panicum, Palmer amaranth and ivyleaf morningglory control initially was at least 90 percent with Prowl H2O PRE. The addition of a chloroacetimide herbicide (Outlook, Warrant, Zidua) extended this control. While early season control was excellent, the addition of Cadre + 2,4-DB POST was needed to maintain season long control of Texas panicum and ivyleaf morningglory. Early season yellow nutsedge control was less than 85 percent with all treatments. The only treatments that controlled Palmer amaranth at least 95 percent and yellow nutsedge at least 90 percent late season were Prowl H2O PRE followed by Zidua SC + Gramoxone AC followed by Cadre + 2,4-DB alone or with Outlook POST.

Trial PFCS17-02 evaluated tolerance of peanut to various application timings of Anthem Flex. Anthem Flex at 2 or 4 fluid ounces per acre was applied PRE, At-Crack and POST to peanut. This was compared to a weed-free check or Dual Magnum at 1.33 pints PRE. This trial was maintained weed-free. Stand reduction was less than 5 percent season regardless of rate or application timing. Due to cool temperatures after planting visual peanut injury in the form of stunting was at 15 percent or greater with both rates of Anthem Flex and with Dual Magnum. This initial injury decreased during the season and was not observable at the end of the season. Initial injury was 6 percent with both rates of Anthem Flex At-Crack and decreased over time. Peanut injury was 5 percent or less with all POST applications of Anthem Flex. Plant stand counts, peanut yield and grade were not affected by any treatment.

Trial PFCS15-03 evaluated the effects of 2,4-DB + glyphosate on peanut. This trial was established to simulate drift and misapplication or tank-contamination. The trial was maintained weed free. Rates were applied from 1X, 1/2X, 1/4X, 1/8X and 1/16X. All of these rates were applied at 30, 60 and 90 days after planting. Peanut stand reduction season long was 5 percent or less with all rates and application timings. Significant visual peanut injury was observed with the 1/4X, 1/2X and 1X rates regardless of application timing. Peanut injury was

greater than 10 percent with both the 1/16 and 1/8X rate when applied 60 DAP. Peanut yields were reduced with the 1/4X, 1/2X and 1X rate regardless of application timing. The 1/8X rate reduced yields when applied at the 60 and 90 DAP timing. Peanut grade was not affected when applied 30 DAP. Grade was reduced with the 1X rate 60 DAP and the 1/2X and 1X rate 90 DAP. Care must be taken to minimize peanut to exposures of 2,4-DB + glyphosate.

Trial PFCS17-04 evaluated the potential for the use of fluridone preemergence in peanut. This trial was maintained weed-free. Stand reduction was 5 percent or less with all treatments. Initial injury was greater than 10 percent with all treatments including fluridone, Valor and Dual Magnum. Visual injury decreased throughout the season and was 1 percent less with all treatments at the end of the season. Plant stand counts, width, yield and grade were not affected by any treatments, similar to the weed-free check.

Trial PFCS17-05 evaluated Anthem Flex (pyroxasulfone + carfentrazone) for weed control in peanut. Peanut stand reduction was 5 percent or less and injury was less than 10 percent with PRE treatments. Injury was 8 to 10 percent with At-Crack applications mainly due to leaf burn from the addition of Gramoxone (paraquat) to all treatments. Injury was less than 5 percent with all the treatments for the remainder of the season. Texas panicum (and Palmer amaranth control early season was at least 95 percent with all PRE and At-Crack treatments. By the end of the season Texas panicum control was at least 85 percent with all treatments that included Cadre POST. Late season Palmer amaranth control was at least 94 percent with all treatments that included Cobra + 2,4-DB POST. Initial ivyleaf morningglory control was at least 97 percent with all PRE treatments that included Valor PRE. Late season control was at least 85 percent with all treatments that included Cadre POST. Yellow nutsedge control was 60 percent or less early season with all treatments. Late season control was at lest 75 percent with all treatments that included Cadre POST.

Appreciation is expressed to the OPC and the NPB for support of this project. Without the support of the OPC and the peanut producers of Oklahoma who contribute to the board through their checkoff dollars, much of this research would not be possible. Appreciation also is extended to Bobby Weidenmaier and the farm crew at the Caddo Research Station for their assistance in conducting these trials. Thanks also to: BASF Crop Protection, FMC Corporation and SePro Corporation for their support of these projects. Finally, the help of Robbie Peterson and Dylon Teeter is appreciated.

RESEARCH