Partners in Progress
PEANUTS

Peanut Research at OSU 2010

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-1031

OKLAHOMA STATE UNIVERSITY

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Partners in Progress
PEANUTS

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Foreword

We have had a long-standing partnership with the Oklahoma Peanut Commission (OPC) and the peanut producers of this state. 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 Report* serves as a means to highlight significant accomplishments in research and Extension programs that have been supported in partnership with the OPC and the National Peanut Board (NPB). With all of the work that has been accomplished, it is important to recognize that much more research and Extension programming needs to be done to keep our peanut producers competitive and in business. Therefore, our work must be focused to solve 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.

Clarence Watson, Associate 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.

Forty-five Years and Still Cracking!

Not only was 2010 the 45th anniversary of the OPC, it may well have been a bench-mark year for a state rich in peanut production history.

Seizing improved marketing opportunities offered by shellers, the state's farmers increased planted acres by more than 50 percent over 2009. In fact, official records reflected a renewed interest in counties absent from peanut production since the quota program was abandoned. With Oklahoma's 2010 average production near 3,500 pounds per acre and early attractive new crop contract offers; industry observers anticipate strong producer response in 2011.

Heat and drought in Alabama and portions of Georgia not only hurt yields but caused quality problems for much of the southeast production area. Certainly, the national supply of peanuts will tighten as the lower quality lots are removed from the 2010 crop. Historically, tight carryover supplies have improved marketing opportunities and positive producer response.

Adding to the optimism for Oklahoma producers is the joint release of Red River Runner by USDA/ARS and Texas A&M University (TAMU), in cooperation with Oklahoma State University (OSU). Perhaps the highest grading peanut offered to southwest producers, the Red River Runner adds improved profits at the farm gate and a heart healthy alternative to consumers. The result of a multi-year cooperative effort, funded in part by the OPC and the Texas Peanut Producers Board, is a tribute to the value of research and its return on investment.

The scientific investigations continue on many fronts and are supported in part by Oklahoma's peanut producers. Screening new breeding lines for pest resistance, evaluating production practices and profit potential, establishing disease control and management protocols, screening for herbicide resistance and efforts to build the perfect peanut are reported in the 2010 *Partners in Progress Peanut Report*.

A special thanks to the OSU Peanut Improvement Team (PIT) and its supporting agencies, the OSU Division of Agricultural Sciences and Natural Resources, the Oklahoma Agricultural Experiment Station, the Oklahoma Cooperative Extension Service and the USDA/ARS Center for Peanut Improvement.

Mike Kubicek, Executive Secretary
Oklahoma Peanut Commission

Partners in Progress PEANUTS

Calcium Evaluation for Large-seeded Runner and Virginia Peanut Varieties

C.B. Godsey and W. Vaughan
Department of Plant and Soil Sciences

J.P. Damicone
Department of Entomology and Plant Pathology

2010 progress made possible through OPC and NPB support

- **Calcium applied as gypsum did not increase yield or grade at either location.**
- **The application of gypsum did not decrease the incidence of pod rot in Jupiter.**
- **Current calcium (Ca) recommendations are adequate for large-seeded runner and Virginia peanut varieties.**

Introduction

Calcium is a nutrient that is required in large quantities by peanuts. Generally, as seed size increases calcium needs increase. Calcium (Ca) must be available to both the plant and the pod, since after the pegs are formed and move into the soil, Ca will not move from the stems to the pegs. The Ca needs of the developing pod must be met by uptake directly from the surrounding soil. Calcium deficiencies may show up as a darkened plumule or a condition known as black heart. This is the result of the peanut kernel obtaining an insufficient amount of Ca. The embryo within the kernel dies and becomes blackened. Poor seed germination and seedling abnormalities result from this type of seed. Extreme deficiency results in lack of pods. If the deficiency is not too extreme, seeds may not develop, leaving only the shells to develop. Calcium also may have some role in pod rot development.

Peanut market types vary in sensitivity to a lack of Ca in the fruiting zone. The Ca levels required for the different peanut types must be considered and must be used as a guide for determining whether to make an application of Ca. The amount of Ca required is partially related to the seed size of the market type planted. For example, Spanish and runner types require less Ca and Virgina types require more. Current recommendations state that, soil test levels of 600 pounds of Ca per acre are adequate for both runner and Spanish type peanuts. Large-seeded Virginia types require soil test levels of more than 1,500 pounds of Ca per acre. States that grow the large seeded Virginia types recommend Ca application regardless of soil test levels. However, within the last 10 years, seed size of newer varieties has increased resulting in a need to see if newer varieties may require higher amounts of Ca. Objective of this research will be to evaluate Ca requirements of recently released runner and Virginia peanut varieties.

Materials and Methods

Two locations were utilized to evaluate Ca needs of large-seeded runners and Virginia peanut varieties in 2010. The first location was near Hydro on a producer's field. The Ca test for the Virginia peanuts was planted to Jupiter. The runner trial was conducted in a nearby field planted to Tamrun OL07. Both fields were managed by the producer with the exception of Ca application. The other location was at the Caddo County Research Station near Fort Cobb. Jupiter and Tamrun OL07 were the varieties used at this location, as well. One additional treatment was added that consisted of 500 pounds of fine gypsum ($CaSO_4$) per acre. This gypsum was a lot finer compared to the other gypsum treatments. Treatments were hand spread on the plot area (12 feet by 20 feet) in June.

Tests were conducted using randomized, complete block design with four replications. The entire plot was dug and then thrashed three days to four days later. Peanuts were placed in a drier until moisture reached 10 percent. Total sound mature kernels (TSMK) were determined on a 200-gram sample from each plot.

Soil chemical characteristics for each site are provided in Table 1. All locations would be considered to have high amounts of Ca present.

Results and Discussion

Yield and grade are reported in Tables 2 and 3. No significant differences were observed in peanut yield or grade for either market type or variety. The lack of differences may be a result of the high soil test Ca levels present in each trial. These results would support our current recommendations that have 1,500 pounds of Ca per acre as our critical soil test Ca level.

Table 1. Soil chemical properties at the calcium trial locations, 2010.

Location	*pH*	*P*	*K*	*T_So$_4$*	*Ca*	*Mg*
	- - - - - - - - - - - - - - - - - lbs/A - - - - - - - - - - - - - - - - -					
Fort Cobb Virginia Ca Test	6.7	40	310	22	2,712	359
Fort Cobb Runner Ca Test	na	na	na	18	1,831	234
Hydro Runner Ca test	7.4	180	340	17	3,612	492
Hydro Virginia Ca test	6.4	137	265	13	1,658	223

Table 2. Peanut yield and grades from the Virginia calcium evaluation trials, 2010.

	Fort Cobb		*Hydro*	
Treatment	*Yield*	*Grade*	*Yield*	*Grade*
- - lbs gypsum/A - -	- - lbs/A - -	- - TSMK - -	- - lbs/A - -	- - TSMK - -
0	4,356	71	4,197	64
500	4,424	71	4,197	59
1,000	4,383	70	3,992	63
1,500	4,610	72	4,147	61
500 fine	4,587	69	3,852	60
LSD (P=0.05)	ns	ns	ns	ns

Table 3. Peanut yield and grades from the runner calcium evaluation trials, 2010.

	Fort Cobb		*Hydro*	
Treatment	*Yield*	*Grade*	*Yield*	*Grade*
- - lbs gypsum/A - -	- - lbs/A - -	- - TSMK - -	- - lbs/A - -	- - TSMK - -
0	5,531	62	4,878	64
500	4,338	67	4,796	69
1,000	4,860	68	4,665	70
1,500	5,254	66	4,864	62
500 fine	4,601	66	5,334	65
LSD (P=0.05)	ns	ns	ns	ns

In addition to yield and grade, pod rot ratings were collected. Pod rot was severe at both locations, but the application of gypsum did not seem to reduce the incidence of pod rot in the Virginia variety (Jupiter).

Evaluating Variable Rate Fungicide Applications for Control of Sclerotinia

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2010 progress made possible through OPC and NPB support

- **Electrical conductivity and elevation were not correlated to high sclerotinia disease pressure areas.**
- **High disease pressure in aerial imagery and soil sclerotia counts were highly correlated.**
- **In years with light sclerotinia pressure, variable rate fungicide application appears to be profitable.**

Introduction

Oklahoma peanut growers continue to try to increase yields and reduce input costs. Perhaps the largest input in a peanut crop is fungicide applications. This is especially true for areas in the state that have high disease pressure from sclerotinia. On average, a single fungicide application costs $50 per acre to $60 per acre to help control the disease.

A large portion of the Oklahoma peanut crop is still grown in areas where sclerotinia is present, so a solution to reduce fungicide input costs would greatly benefit producers struggling to control the disease.

Precision ag technologies (GPS, variable rate applicators, optical sensors, etc.) are currently available that provide producers with application options. Currently, very few precision ag technologies are used in peanut production. Some potential technologies that could be used to target applications of fungicide to high disease pressure areas is remote sensing (aerial photos). Aerial photos can be used to determine Normalized Difference Vegetation Index (NDVI), which is a simple numerical indicator that can be used to analyze remote sensing measurements. This can be used to assess whether the observed target contains live green vegetation.

In 2009, one peanut field in Caddo County was identified that had visual evidence of sclerotinia. Aerial images were collected in 2009 from this field. Early observations look promising in identifying areas of higher sclerotinia pressure from near infra-red (NIR) or other aerial photographs. This should enable target applications of fungicide to control the highest disease areas. In addition, some areas of the field may not need to be treated or could be treated with a reduced rate of fungicide. Depending on pressure level of disease in a field, it is believed that sclerotinia fungicide application costs can be reduced by 15 percent to 35 percent. This is an early estimate but savings should be realized.

Implementation of this on a producer level should be relatively inexpensive since most ag retailers have the capability to make variable rate prescription maps and apply products variably. If producers do their own spraying, set-up costs to make variable rate applications should be relatively inexpensive and could easily be recouped from fungicide savings. In addition, photographs are not needed every year, except to indentify high disease pressure areas. The objective of this project was to evaluate the potential for variable rate application of fungicide to control sclerotinia.

Materials and Methods

The same field that was mentioned previously (aerial images), identified in 2009 that had a history of sclertonia was grid soil samples on 0.5 acres. Soil samples were taken to a depth of 3 in an effort to characterize the number of sclerotia present. These sclerotia counts were used to determine if correlation existed between sclerotia counts and data gathered from the imagery in 2009.

In 2010, electrical conductivity (EC) was gathered with the use of a Veris machine on another portion of the same field that was to be rotated to peanuts. This field also was grid soil sampled to determine density of sclerotia. In addition to the EC data, sub meter elevation was recorded. The data collected was used to see if any correlation exists between sclerotia density and these characteristics. In an effort to evaluate variable rate fungicide applications, multiple strips across the field were applied variably depending on disease pressure from sclerotia density. Peanut yield from these strips were compared to adjacent strips across the field that received the recommended flat rate of fungicide. Yield data was collected by modifying a cotton yield sensor.

Results and Discussion

From the field where in-season aerial imagery was collected in 2009, sclerotia counts and disease pressure was highly correlated. High counts of sclerotia corresponded to high disease pressure late in the growing season. This was an indication that the previous year's aerial imagery or grid soil sampling used to identify sclerotia density, may be good tools on which to base variable rate applications.

In 2010, another portion of the field planted to peanuts was grid soil sampled, and EC data was collected prior to planting. Electrical conductivity and elevation were not well correlated with sclerotia counts (Figures 1 and 2). This indicates that using EC or elevation may not be good tools to identify management zones for variable rate fungicide application. Aerial imagery was not available for this portion of the field peanuts were not planted the previous year.

Since sclerotia counts looked promising as a tool to base fungicide application rates from the 2009 data, sclerotia density was used to delineate management zones for variable rate fungicide application. Four variable rate application strips were applied across the length of the field (Figure 3).

Paired comparisons of yield monitor data did not indicate any significant differences in yield outside the application

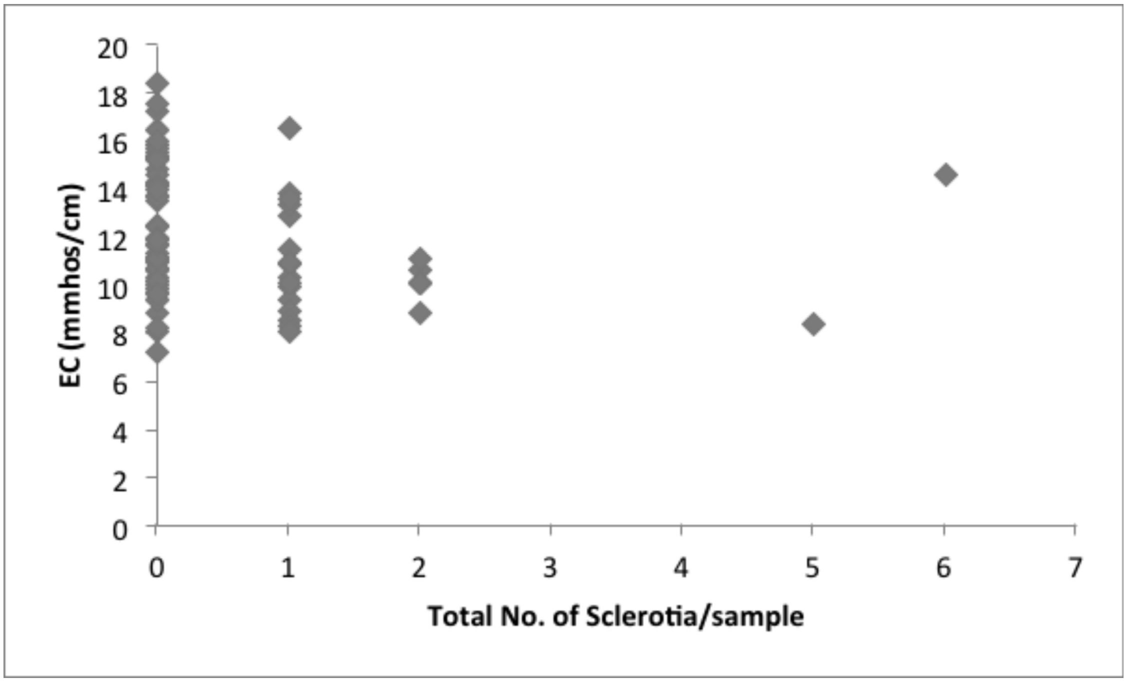

Figure 1. Electrical conductivity versus total number of sclerotia in a 60-feet radius around the soil sample point.

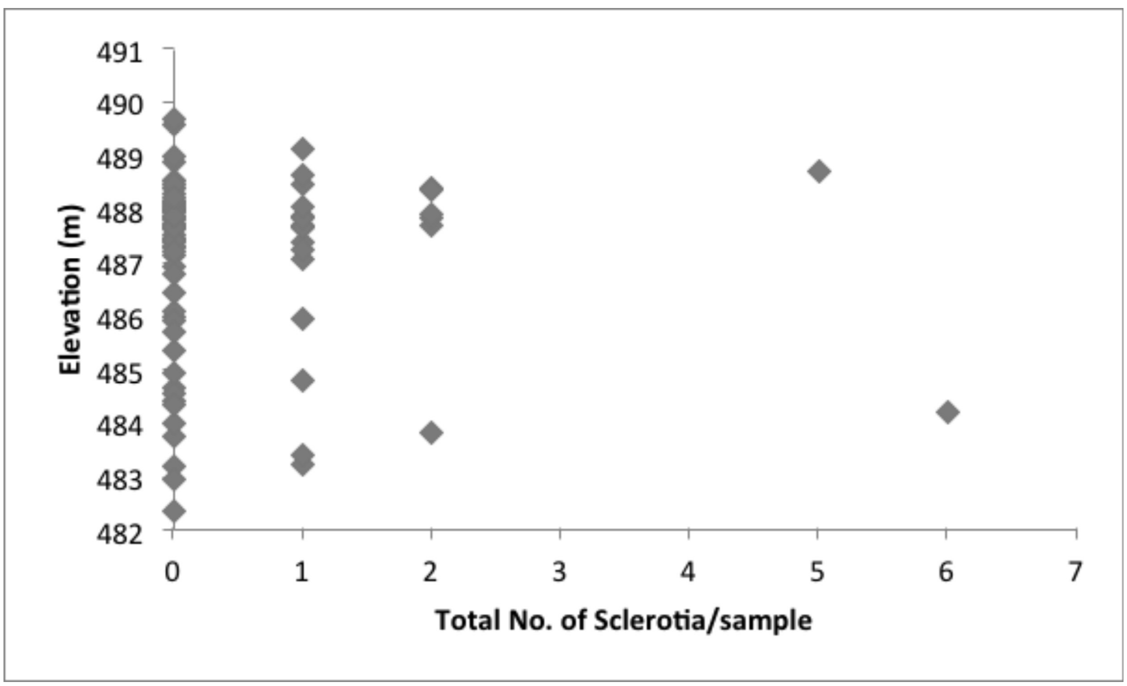

Figure 2. Elevation versus total number of sclerotia within a 60-feet radius of each soil sample point.

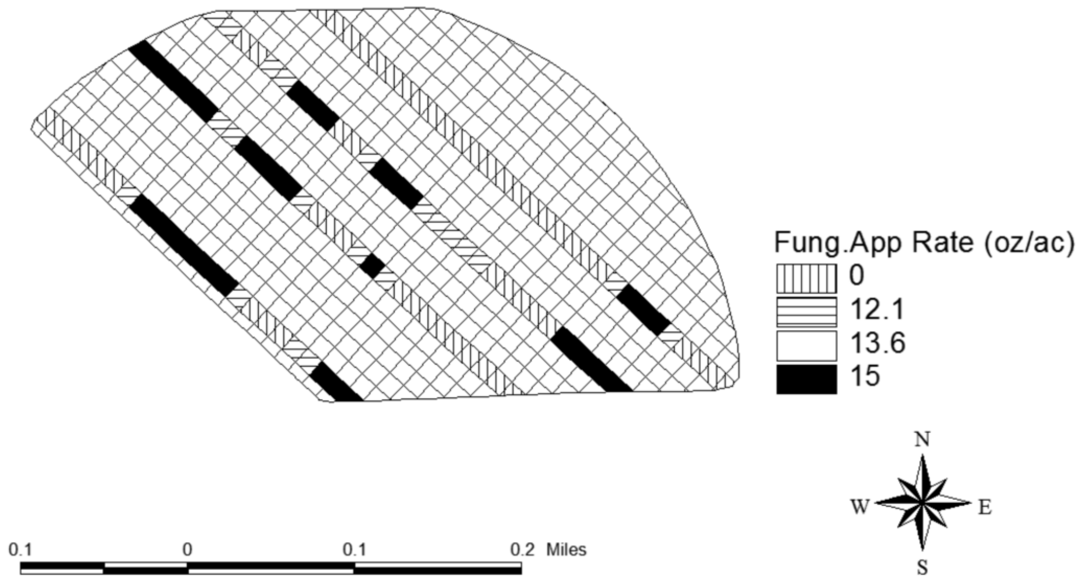

Figure 3. Variable rate fungicide application strips.

strip where a flat rate of 13.6 ounces of Endure was applied when compared to adjacent areas inside the application strip where no Endure was applied (Table 4).

Sclerotinia was not severe in 2010, but results from this study indicate that fungicide applications can be reduced or eliminated in areas of the field where sclerotia counts were zero. If sclerotinia pressure was severe, a flat rate application may be warranted. However, in light pressure years a variable rate application appears to be feasible. A basic economic comparison indicates that applying fungicide variably across the entire 44 acres of the field would result in a cost of $928 per application. In comparison, a flat rate across the field based on a 12 ounce per acre application rate would result in a cost of $2,254 per application.

This study will continue in 2011.

Table 4. Comparison of inside (0 oz/A) and outside (13.6 oz/A) of the variable rate fungicide application strips.

Paired Comparison	*West of Variable Rate Application Strip*	*0 oz/A*	*East of Variable Rate Application Strip*
1	6,539	5,946	5,757
2	5,933	6,353	5,996
3	6,527	5,784	5,839
4	5,892	6,065	5,503
5	5,801	6,029	5,950
6	6,169	5,988	5,643
7	5,709	5,566	5,514
Average	6,081	5,962	5,743

Table 5. Fungicide cost if variable rate application applied to the whole field based on sclerotia counts.

Sclerotia Count	*Percent of Field*	*Rate*	*Cost*
0	52	0	$0
0.3-0.8	28	9	$473
0.8-1.4	12	12	$271
1.4-2.6	6	12	$135
2.6-5.3	2	13	$49
		Total Cost	$928

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Improving Weed Control in Peanuts with Pre-emergence Herbicides

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2010 progress made possible through OPC and NPB support

- **Pre-emergence herbicides are valuable and necessary to improve control of many weeds, including pigweed species, yellow nutsedge and morningglories.**
- **Valor SX® applied pre-emergence improved control of many broadleaf weeds, including pigweed and morningglory species. Valor SX® must be applied to the soil surface prior to peanut emergence to avoid crop injury and should be applied with additional pre-emergence (PRE) herbicides to improve control of other weeds, including grasses.**

Introduction

Weed control continues to be a challenge for peanut production in Oklahoma. Several pre-emergence herbicides are available for use at planting or as lay-by treatments with early-post-emergence (POST) treatments to improve early-season weed control. Pre-emergence herbicides also are useful for controlling weeds that have developed resistance to other PRE and POST herbicides, such as acetolactate synthase-resistant (ALS) pigweed species. To evaluate these PRE herbicides, a study was conducted at the OSU Fort Cobb Research Station in 2010.

Materials and Methods

TamSpan 90 was planted May 24 at 80 pounds per acre. Pre-emergence treatments were applied immediately after planting and were incorporated with irrigation. Visual estimates of crop injury and weed control were collected at four weeks after planting.

Results and Discussion

Valor SX® (active ingredient: flumioxazin) is a PRE herbicide used to improve control of many broadleaf weeds in peanuts. Valor SX® belongs to the PPO inhibitor herbicide mode of action and is an excellent alternative for controlling ALS-resistant pigweed species. Furthermore, since Valor SX® must be applied to the soil surface prior to peanut emergence, it will provide early-season residual weed control and reduce the number of weeds present during POST treatments. In this trial, Valor SX® provided the best weed control when used in combination with Dual Magnum® or Prowl H_2O®. Valor SX®

is not particularly good at controlling grasses and should be applied with other PRE herbicides to improve grass control.

Spartan® (sulfentrazone) provided excellent control of Palmer amaranth, yellow nutsedge and morningglory; however, this product is currently not labeled for use in peanuts in Oklahoma because of potential crop injury.

Weed control trials will be conducted again during 2011 to evaluate PRE herbicides to further improve weed control in Oklahoma peanut production.

Acknowledgements

Thank you to the OPC for providing funding for this research.

Table 6. Visual estimates of crop injury and weed control at four weeks after planting for various pre-emergence herbicides and herbicide combinations for use in peanut production in Oklahoma.

			% Crop Injury and Weed Control				
Treatment	*Timing*	*Rate (per acre)*	*Injury*	*Annual Grasses*	*Yellow Nutsedge*	*Palmer Amaranth*	*Morningglory*
Valor SX®	PRE	2 oz	5	63	64	70	96
Dual Magnum®	PRE	1.33 pt	1	61	96	96	91
Prowl H_2O®	PRE	2 pt	3	80	79	79	81
Valor SX® + Prowl H_2O®	PRE	2 oz + 2 pt	7	84	81	99	73
Valor SX® + Dual Magnum® + Prowl H_2O®	PRE	2 oz + 0.8 pt + 1.5 pt	3	92	93	98	97
Outlook®	PRE	16 fl oz	1	98	81	95	89
Dual Magnum® + Spartan®[a]	PRE	1.33 pt + 4 fl oz	11	84	98	99	98
Prowl H_2O® + Spartan®[a]	PRE	2 pt + 4 fl oz	33	90	98	99	99
Untreated			0	0	0	0	0
LSD[a] (5%)			7	20	19	17	19

[a] LSD = least significant difference.

Integrated Management of Peanut Diseases

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Department of Entomology and Plant Pathology

2010 progress made possible through OPC and NPB support

- **Under light pressure from Sclerotinia blight, several experimental fungicides provided control of Sclerotinia blight that was similar to the fungicides Endura® and Omega®.**
- **Red River Runner (formerly ARSOK-R1) continues to produce the highest crop values ($/A) under pressure from Sclerotinia blight from a combination of high grades and moderate disease resistance.**
- **On Virginia-type peanuts under severe pod rot pressure, fungicides such as Abound® and ProPhyt® (phosphorous acid) reduced pod rot, increased yield and reduced kernel damage below 2 percent.**
- **Reduced fungicide programs made according to the calendar or the weather-based advisory program continued to provide good leaf spot control.**
- **Several experimental fungicides provided excellent control of early leaf spot and/or web blotch.**

Eight field trials were completed in 2010 that addressed the management of important peanut diseases in Oklahoma. The management strategies that were evaluated included chemical 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, Sclerotinia blight and pod rot. Chad Godsey and Wendal Vaughan, OSU Plant and Soil Sciences; and Hassan Melouk and Kelly Chenault, USDA/ARS in Stillwater, are acknowledged for their cooperation and assistance in these studies. Appreciation is expressed to Mark DeLeon at Erick and Merlin Schantz at Hydro, peanut farmers who hosted the on-farm trials. The excellent cooperation of Bobby Weidenmaier and the farm crew at the Caddo Research Station continues to be greatly appreciated.

Results from 2010 are summarized in this report. In interpreting the results, small differences in treatment values should not be overemphasized. Least significant differences (LSD) values are shown at the bottom of most tables. Unless two values differ by at least the LSD value shown, little confidence can be placed in the superiority of one treatment or variety over another.

Weather conditions were variable in 2010. Rainfall was above normal and temperatures were below normal for July. However, temperatures were generally above normal and rain below normal for the remainder of the growing season. Foliar diseases such as leaf spot and web blotch were significant problems that got an early start during the July rains. Southern blight was a minor problem at the Caddo Research Station. Sclerotinia blight only reached low levels at the Caddo Research

Station where it is normally severe. Pod rot was the most significant soilborne disease problem in 2010. It was severe on many acres of Virginia-type peanuts. Yields and grades were generally above average as a result of the extended warm and dry fall.

Sclerotinia Blight

Sclerotinia blight remains a destructive disease in Oklahoma. It occurs in all areas of the state except in far southwestern production areas. Field trials at the Caddo Research Station were focused on evaluating new fungicides, developing effective reduced fungicide programs with registered fungicides, and determining the disease and yield responses of new, high oleic varieties and breeding lines to fungicide programs. In 2010, disease pressure was lower than normal for this site.

Evaluation of Fungicides

The objective of this study was to evaluate the experimental fungicides DPX-LEM17, DPX-YT669, DPX-Q8Y78 and Propulse for control of Sclerotinia blight. The experimental fungicides were compared to the fungicides Omega® and Endura®. Two preventive applications of each fungicide were made on a four-week interval beginning 65 days after planting except for Propulse, which was applied on a 21-day schedule.

Sclerotinia blight did not develop until late September and only reached low levels by harvest when compared to previous trials at this site (Table 7). Dry conditions in August and severe deer grazing of the plots, which served to reduce canopy density, reduced disease development. All of the treatments except DPX-Q8Y78 at 24 fluid ounces reduced Sclerotinia blight compared to the untreated check. Disease pressure was not sufficient to affect yield.

Table 7. Effect of fungicides for control of Sclerotinia blight on runner-type peanuts (Tamrun OL02) at the Caddo Research Station, Fort Cobb, 2010.

Treatment and rate/A (timing)[z]	*Sclerotinia Blight (%)*	*Yield (lbs/A)*	*Crop Value ($/A)*[y]
Omega® 4F 1.5 pt (P1, P2)	19.0 bc [x]	5,140 a	917 a
Endura® 70WG 10 oz (P1, P2)	19.2 bc	5,060 a	903 a
DPX-LEM17 1.67F 16 fl oz (P1, P2)	28.7 bc	5,205 a	929 a
DPX-LEM17 1.67F 24 fl oz (P1, P2)	20.7 bc	5,053 a	902 a
DPX-YT669 2.08F 8 fl oz (P1+P2)	21.0 bc	4,937 a	896 a
DPX-YT669 2.08F 16 fl oz (P1+P2)	22.7 bc	4,929 a	881 a
DPX-Q8Y78 2F 18 fl oz (P1+P2)	30.5 bc	4,929 a	880 a
DPX-Q8Y78 2F 24 fl oz (P1+P2)	31.0 ab	4,763 a	850 a
Propulse 3.3F 13.7 fl oz (21-d)	18.5 c	5,024 a	896 a
check	42.7 a	4,980 a	889 a
LSD (P=0.05)[w]	12.1	ns	ns

[z] P1 and P2 = preventive applications on July 23 and Aug. 26, respectively. 21-day = applications on July 23, Aug. 12 and Sept. 2.

[y] Based on an average grade of 73 percent TSMK.

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

[w] Fisher's least significant difference (LSD).

[v] NS=treatment effect not significant at P=0.05.

Timing of Fungicide Applications

A fungicide application for Sclerotinia blight lasts about three weeks, and preventive applications are recommended to provide full-season protection. Because the fungicides Omega® and Endura® are expensive, reduced application programs are needed that use a single, well-timed application. The objective of this study was to identify efficient use patterns for Omega® and Endura®. The reduced application program consisted of single applications made on demand (first sign of disease). Reduced application programs were compared to preventive applications made according to the calendar at 65 days and 95 days after planting, or on a 14-day schedule.

Sclerotinia blight did not develop until late September and only reached low levels by harvest compared to previous trials at this site (Table 8). Dry conditions in August and severe deer grazing of the plots, which served to reduce canopy density, reduced disease development. All of the treatments reduced Sclerotinia blight compared to the untreated check. Endura® and Propulse provided the best control. Preventive, demand and 14-day application schedules were similar in effectiveness. Disease pressure was not sufficient to affect yield.

Variety Response to Fungicide Programs

Fungicides that are highly effective in the control of Sclerotinia blight are now registered. However, the high cost of both Omega® and Endura® has limited their effectiveness because adequate

Table 8. Effect of fungicide application timing on control of Sclerotinia blight on runner-type peanuts (Tamrun OL02) at the Caddo Research Station, Fort Cobb, 2010.

Treatment and rate/A (timing)[z]	*Sclerotinia Blight (%)*	*Yield (lbs/A)*	*Crop Value ($/A)*[y]
Omega® 4F 1.5 pt (P1, P2)	17.7 bc[y]	4,951 a	873 a
Omega® 4F 1.5 pt (D)	13.7 bcd	5,002 a	881 a
Omega® 4F 1 pt (P1, P2)	18.7 b	5,009 a	882 a
Endura® 70WG 10 oz (P1, P2)	13.2 bcd	4,813 a	848 a
Endura® 70WG 8 oz (P1+P2)	10.2 d	4,697 a	827 a
Endura® 70WG 10 oz (D)	9.0 d	4,792 a	845 a
Propulse 3.3F 13.7 fl oz (14-d)	10.7 cd	5,096 a	898 a
DPX-LEM17 1.67F 1 pt (14-d)	18.0 bc	5,140 a	905 a
Tilt®/Bravo® 4.3F 1.5 pt + Omega® 4F 0.5 pt (14-d)	12.7 bcd	4,936 a	870 a
check	32.5 a	4,763 a	839 a
LSD (P=0.05)[w]	7.3	ns	ns

[z] P1 and P2 = preventive applications on July 23 and Aug. 26, respectively. D = demand application on Aug. 26, 14-d = applications on July 23, Aug. 6, Aug. 19, Sept. 2.
[y] Based on an average grade of 72 percent TSMK.
[x] Values in a column followed by the same letter are not significantly different a P=0.05.
[w] Fisher's least significant difference (LSD).
[v] Treatment effect not significant at P=0.05.

rates and numbers of applications are not always used. Peanut varieties have different reactions to Sclerotinia blight and use of partially resistant varieties may reduce the cost or preclude the need for a fungicide program. Economic returns from fungicide programs for Sclerotinia blight are mostly positive for susceptible varieties such as Flavor Runner 458 and break-even for moderately resistant cultivars such as Tamrun OL02, Tamrun OL07 and Red River Runner. Economic returns are almost always negative for resistant varieties such as Tamspan 90 and Tamnut OL06.

The objective of this study was to evaluate the disease and yield responses of high oleic varieties Tamrun OL02, Flavor Runner 458, Tamrun OL07, Tamnut OL06 and Red River Runner (formerly ARSOK-R1) to various levels of fungicide input for control of Sclerotinia blight. The high-input treatments consisted of two preventive applications. The low-input treatment was a single application made at the first appearance of disease (demand).

Sclerotinia blight did not develop until late September and only reached low levels by harvest when compared to previous trials at this site (Table 9). Dry conditions in August and severe deer grazing of the plots, which served to reduce canopy density, reduced disease development. Levels of Sclerotinia blight in response to fungicide programs varied depending on the variety. All fungicides reduced Sclerotinia blight compared to the untreated check on Flavor Runner 458, but not on Red River Runner or Tamnut OL06. On Tamrun OL02 and Tamrun OL07, all fungicide treatments except one of the Omega® treatments reduced disease incidence compared to the check. In untreated plots, Flavor Runner 458 was most susceptible and Tamnut OL06 was most resistant with the other, moderately resistant cultivars being intermediate. There was little difference in disease control between preventive and demand programs, or between the fungicides Omega® and Endura®. All fungicides treatments numerically increased yield and crop value compared to the untreated check, but responses were only statistically significant for Flavor Runner 458. On Flavor Runner 458, preventive programs, but not demand programs, increased yield and crop value. Yields were generally highest for the moderately resistant varieties and lowest for the resistant Spanish-type variety Tamnut OL06. Crop values were generally highest for Red River Runner because of its high grade relative to the other varieties. Because of the unusually low disease pressure, planting a moderately resistant variety without fungicide treatment was among the most profitable strategies in 2010.

Southern Blight, Limb Rot and Pod Rot

Southern blight, limb rot and pod rot are damaging soilborne diseases that are widely distributed in Oklahoma. Effective management relies on the use of fungicide programs that control both foliar and soilborne diseases. Fungicide programs are recommended in fields with a history of damage from southern blight and limb rot. Folicur, Abound® and Provost® have provided good to excellent control of these soilborne diseases, as well as foliar diseases. Pod rot is caused by *Rhizoctonia*—which also causes limb rot—*Pythium* or both fungi in combination. Pod rot control has relied on planting partially resistant varieties and avoiding highly susceptible varieties such as Virginia types. While OSU data on pod rot control with fungicides has been inconclusive, Abound is widely used to control this disease. Research is needed to assess the benefits and economic returns from using these fungicides and assessing the effectiveness of experimental fungicides under development for use on peanuts.

Partners in Progress PEANUTS

Table 9. Disease and yield responses of high oleic peanut varieties to fungicide programs for Sclerotinia blight at the Caddo Research Station, Fort Cobb, 2010.

Treatment and Rate/A (timing)[z]	*TOL02*	*FR458*	*RRR*	*TOL07*	*TOL06*	*Avg*[y]
			Sclerotinia blight (%) – Oct. 21			
Omega® 4F 1.0 pt (P1,P2)	7.2 b[x]	20.0 b	9.2 a	11.5 ab	0.2 b	9.6
Omega® 4F 1.5 pt (D)	11.0 ab	17.5 bc	8.7 a	11.2 b	0.5 b	9.8
Endura® 70WG 8 oz (P1,P2)	7.7 b	9.2 c	10.2 a	8.5 bc	4.0 a	7.9
Endura® 70WG 10 oz (D)	7.2 b	10.2 bc	11.0 a	4.5 c	2.0 b	7.0
check	15.7 a	36.7 a	18.5 a	18.0 a	1.2 b	18.0
Avg[w]	9.8	18.7	11.5	10.7	1.6	
LSD[v] (P=0.05)	5.3	10.2	ns[u]	6.6	1.8	
			Yield (lbs/A)			
Omega® 4F 1.0 pt (P1,P2)	5,463 a	4,574 ab	4,955 a	4,991 a	3,657 a	4,728
Omega® 4F 1.5 pt (D)	4,973 a	3,939 bc	5,037 a	4,628 a	3,730 a	4,461
Endura® 70WG 8 oz (P1,P2)	5,018 a	4,828 a	4,837 a	5,400 a	3,775 a	4,772
Endura® 70WG 10 oz (D)	5,028 a	4,247 abc	5,009 a	4,846 a	3,821 a	4,590
check	4,755 a	3,530 c	4,537 a	4,392 a	3,185 a	4,080
Avg	5,047	4,223	4,875	4,851	3,634	
LSD (P=0.05)	ns	750	ns	ns	ns	
			Value[t] ($/A)			
Omega® 4F 1.0 pt (P1,P2)	960 a	799 ab	930 a	890 a	604 a	836
Omega® 4F 1.5 pt (D)	873 a	688 bc	946 a	825 a	616 a	790
Endura® 70WG 8 oz (P1,P2)	881 a	843 a	908 a	963 a	624 a	844
Endura® 70WG 10 oz (D)	883 a	743 abc	940 a	864 a	631 a	812
check	835 a	616 c	852 a	783 a	526 a	723
Avg	887	738	915	865	600	
LSD (P=0.05)	ns	131	ns	ns	ns	

[z] P1 and P2 = preventive applications on July 23 and Aug. 26, respectively; D = demand application on Aug. 26.

[y] Averaged over variety.

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

[w] Averaged over fungicide treatment.

[v] Fisher's least significant difference (LSD).

[u] NS=treatment effect not significant at P=0.05.

[t] Based on an average grade (percent TSMK) of 72 percent for TOL02, 71 percent for FR458, 77 percent RRR, 73 percent for TOL07 and 68 percent for TOL06.

Evaluation of Fungicide Programs

The objective of this study was to evaluate fungicide programs with experimental and registered fungicides on control of soilborne and foliar diseases. Full-season fungicide programs consisted of six applications on a 14-day schedule. Fungicide programs consisted of the experimental fungicides DPX-LEM17, DPX-YT669, DPX-Q8Y78 and DPX-QFA61; and the fungicides Abound®, Folicur® and Provost® applied two times to four times at mid season. The remaining applications in the six-spray programs were Bravo® for leaf spot. Fungicide programs were compared to an untreated check and a full-season Bravo® program for control of leaf spot only.

Leaf spot appeared in early September and increased to low levels in the untreated check by harvest (Table 10). Leaf spot did not cause measurable levels of defoliation in this study. The hot, dry weather in August and September, and the lack of a peanut crop in the field for the previous two years, contributed to the low disease levels. All of the fungicide programs reduced leaf spot to low levels. Pod rot, the only soilborne disease that developed, occurred at low levels (<5 percent) and did not differ among treatments. Disease levels were not sufficient to affect yield or crop value.

Table 10. Effect of fungicide program for soilborne and foliar diseases on disease control on Spanish-type peanuts (Tamnut OL06), Erick, 2010.

Treatment and Rate/A (timing)[z]	*Early Leaf Spot (%)*	*Pod Rot (%)*	*Yield (lbs/A)*	*Crop Value ($/A)*[y]
Check	23.8 a[x]	0.0 a	4,900 a	820 a
Bravo® 6F 1.5 pt (1-6)	2.9 b	1.2 a	5,191 a	869 a
Bravo® 6F 1.5 pt (1,6) Provost® 3.6F 8 fl oz (2-5)	0.9 b	0.9 a	5,563 a	931 a
Bravo® 6F 1.5 pt (1,6) Folicur® 3.6F 7.2 fl oz (2-5)	3.0 b	0.9 a	5,082 a	851 a
Bravo® 6F 1.5 pt (1,6)				
DPX-LEM17 1.67F 1 pt (2-5)	0.8 b	0.6 a	5,055 a	846 a
Bravo® 6F 1.5 pt (1,3,5,6)				
DPX-YT669 2.08F 12 fl oz (2,4)	1.3 b	1.9 a	5,654 a	946 a
Bravo® 6F 1.5 pt (1-6) DPX-Q8Y78 2F 18 fl (2-5)	0.1 b	0.3 a	5,091 a	852 a
Bravo® 6F 1.5 pt (1-6)				
DPX-QFA61 2.92F 14.5 fl oz (2-5)	3.9 b	2.2 a	5,300 a	887 a
Tilt®/Bravo® 4.3SE 1.5 pt (1,3,5,6)				
Abound® 2.08F 18.5 fl oz (2,4)	0.0 b	0.3 a	5,100 a	854 a
Tilt®/Bravo® 4.3SE 1.5 pt (1,3,5,6)				
Abound® 2.08F 12.3 fl oz (2,4)	1.6 b	4.4 a	5,654 a	946 a
LSD (P=0.05)[w]	6.0	ns[v]	ns	ns

[z] 1 to 6 are the spray dates 1=July 8, 2=July 22, 3=Aug. 5, 4=Aug. 19, 5=Sept. 2, and 6=Sept. 16.

[y] Based on an average grade of 69 percent TSMK.

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

[w] Fisher's least significant difference (LSD).

[v] NS = treatment effect not significant at P=0.05.

Evaluation of Fungicide Programs for Pod Rot

The objective of this study was to evaluate fungicides programs specific for pod rot on a highly susceptible, Virginia-type variety in a field with a history of pod rot. The fungicides Ridomil and ProPhyt (phosphorous acid) have activity only on water molds—such as *Pythium*—while Abound® has excellent activity on *Rhizoctonia*, and some activity on *Pythium*. The fungicides were applied twice on four-week intervals beginning at early pod set.

Pod rot, caused primarily by *Pythium* was severe, affecting more than 60 percent of plants and 40 percent of pods in the untreated check (Table 11). ProPhyt and ProPhyt + Abound® were the only treatments that significantly reduced pod rot incidence and severity compared to the untreated check. All treatments except Ridomil Gold® increased yield compared to the untreated control. The untreated check and Ridomil Gold® had the lowest crop values, which resulted from levels of damaged kernels that exceeded the 2 percent threshold for Segregation 1 peanuts in one or more of the plots. Ridomil Gold® 4E caused obvious yellowing around the edges of leaves on treated plants. None of the treatments provided a high level of disease control.

Foliar Diseases

Foliar diseases are widespread across all production areas of Oklahoma and can be damaging when severe. Where early leaf spot is not controlled, yield losses have averaged from 500 pounds to 700 pounds per acre. However, losses exceeding 1,000 pounds per acre are possible in years when weather favors severe disease development and vines become completely defoliated. Foliar diseases can be effectively controlled with a full-season fungicide program that consists of six sprays per season.

Table 11. Effect of fungicide programs on control of pod rot on Virginia-type peanuts (Jupiter), Hydro, 2010.

	Pod Rot (%)[y]		*Damaged*	*Yield*	*Crop Value*
Treatment and Rate/A[z]	*Incidence*	*Severity*	*Kernels (%)*	*(lbs/A)*	*($/A)*
Check	62.0 a[x]	42.5 a	2.5 a	3,340 b	379 b
Abound® 2.08F 18.5 fl oz	54.5 ab	36.9 ab	1.1 ab	4,138 a	707 a
Ridomil Gold® 4E 0.5 pt	57.2 a	43.5 a	2.3 a	3,202 b	468 b
Abound® 2.08F 18.5 fl oz +					
Ridomil Gold® 4E 0.5 pt	52.7 ab	40.0 ab	0.3 b	4,378 a	776 a
ProPhyt 4.2L 4 pt	39.2 c	28.9 b	1.1 ab	3,957 a	692 a
Abound® 2.08F 18.5 fl oz +					
ProPhyt 4.2L 4 pt	46.2 bc	28.9 b	1.0 a	4,327 a	749 a
LSD (P=0.05)[w]	10.6	11.7	1.5	610	221

[z] Treatments were applied on July 15 and Aug. 12.

[y] Incidence=percentage of 6-inch row segments with pod rot. Severity=percentage of pods with rot.

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

[w] Fisher's least significant difference (LSD).

Table 12. Evaluation of Topguard® and other fungicides on control of foliar diseases on Spanish-type peanuts (Tamspan 90) at the Caddo Research Station, Fort Cobb, 2010.

Treatment and Rate/A (timing)[z]	*Early Leaf Spot (%)*	*Web Blotch (%)*	*Defoliation (%)*	*Yield (lbs/A)*	*Value ($/A)*[y]
Check	74.1 a[x]	13.3 e	42.9 a	3,891 a	611 a
Bravo® 6F 1.5 pt (1-6)	5.0 d	28.3 bcd	7.1 c	4,007 a	630 a
Bravo® 6F 1.5 pt (1,6) Topguard® 1F 7 fl oz (2-5)	26.7 c	31.7 abc	16.6 bc	3,819 a	600 a
Bravo® 6F 1.5 pt (1,6) Topguard® 1F 10 fl oz (2-5)	19.2 cd	39.2 a	14.2 bc	3,935 a	618 a
Bravo® 6F 1.5 pt (1,6) Topguard® 1F 14 fl oz (2-5)	13.3 cd	34.1 abc	10.8 c	4,116 a	647 a
Bravo® 6F 1.5 pt (1,6) Topguard® 1F 28 fl oz (2-5)	0.0 d	31.6 abc	9.1 c	4,087 a	642 a
Bravo® 6F 1.5 pt (1,6) Bravo® 6F 1 pt + Topguard® 1F 7 fl oz (2-5)	9.6 cd	35.0 abc	9.1 c	4,203 a	660 a
Bravo® 6F 1.5 pt (1,6) Folicur® 3.6F 7.2 fl oz (2-5)	26.2 c	38.3 ab	11.6 bc	4,262 a	670 a
Bravo® 6F 1.5 pt (1,6) Provost® 3.6F 7.2 fl oz (2-5)	1.2 d	26.7 cd	6.6 c	4,501 a	707 a
Bravo® 6F 1 pt + Folicur® 3.6F 7.2 fl oz (A1 to A4)	47.5 b	17.5 ed	23.7 b	4,189 a	658 a
LSD (P=0.05)[w]	19.9	10.8	12.6	ns[v]	ns

[z] 1 to 6 are 14-day applications on 1=June 30, 2=July 15, 3=July 29, 4=Aug. 12, 5=Aug. 26 and 6=Sept. 9; A1 to A5 applications made on June 30, July 23, Aug. 12, and Sept. 9 according to the MESONET Leaf Spot Advisory program.

[y] Based on an average grade of 64 percent TSMK.

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

[w] Fisher's least significant difference (LSD).

[v] Treatment effect not significant at P=0.05.

However, reduced fungicide programs that are effective and utilize fewer sprays per season are needed to reduce the cost of peanut production. The objectives of the research on foliar diseases were to identify new fungicides and to develop effective-reduced application programs.

Evaluations of Fungicides at the Caddo Research Station Trial 1

The objective of this trial was to evaluate the experimental fungicide Topguard® at various rates in comparison to the fungicides Bravo®, Folicur® and Provost®. Fungicides were applied on a full-season, 14-day schedule that totaled six sprays. Topguard®, Folicur® and Provost® were applied as a block of four mid-season sprays. The first and last application was chlorothalonil as Bravo®. A tank mixture of Bravo® + Folicur® also was applied according to the weather-based, Leaf Spot Advisory program on the Oklahoma MESONET (http://agweather.mesonet.org/).

Leaf spot was established by early September and increased to moderate levels compared to an adjacent trial (Table 12).

Web blotch appeared in early September and was more severe in fungicide-treated plots because most leaves in untreated check plots had severe early leaf spot. All fungicide programs reduced leaf spot and defoliation compared to the untreated check. Bravo® and Topguard® at 28 fluid ounce, Bravo® + Topguard® and Provost provided the best control of leaf spot. All treatments numerically increased yield and crop value compared to the untreated check, but responses were not statistically significant.

Evaluations of Fungicides at the Caddo Research Station Trial 2

The objective of this trial was to evaluate various DPX experimental fungicides in comparison with the fungicides Bravo®, Folicur®, Headline® and Provost®. Fungicides were applied as full-season, 14-day schedules except for Bravo + Folicur which was applied in a reduced (three application) calendar program.

Leaf spot was severe by early September and increased to severe levels, causing more than 70 percent defoliation by harvest (Table 13). Web blotch appeared in early September and was more severe for some treatments than the untreated check plots because most leaves in the check had leaf spot or were defoliated. All fungicide programs reduced leaf spot and defoliation compared to the untreated check. Bravo®, DPX-YT669 at 12 fluid ounces, and Headline®/Provost® provided the best control of early leaf spot. All

Table 13. Evaluation of experimental fungicides on control of foliar diseases on Spanish-type peanuts (Tamspan 90) at the Caddo Research Station, Fort Cobb, 2010.

Treatment and Rate/A (timing)[z]	*Early Leaf Spot (%)*	*Web Blotch (%)*	*Defoliation (%)*	*Yield (lbs/A)*	*Value ($/A)[y]*
Check	93.3 a[x]	0.0 d	71.2 a	2,802 e	453 e
Bravo® 6F 1.5 pt (1-6)	20.8 ed	29.2 a	13.3 bcd	4,457 ab	720 ab
DPX-LEM17 1.67F 1 pt (1-6)	53.3 b	0.8 d	20.8 b	4,007 bcd	647 bcd
DPX-YT669 2.08F 6 fl oz (1-6)	54.2 b	0.0 d	17.9 bc	3,928 d	635 d
DPX-YT669 2.08F 12 fl oz (1-6)	24.1 d	6.7 c	5.0 ef	3,906 d	631 d
DPX-Q8Y78 2F 18 fl oz (1-6)	30.0 cd	5.0 cd	10.4 cde	4,174 bcd	674 bcd
Headline® 2.08E 9 fl oz (1,2) DPX-LEM17 1.67F 1 pt (3-5) Bravo® 6F 1.5 pt (6)	34.6 cd	2.9 cd	3.7 ef	4,421 abc	714 abc
DPX-QFA61 2.92F 14.5 fl oz (1,2) Provost® 3.6F 7 fl oz (3,4,5) Bravo® 6F 1.5 pt (6)	29.1 cd	6.6 c	7.1 def	3,978 cd	643 cd
Headline® 2.08E 9 fl oz (1,2) Provost® 3.6F 7 fl oz (3,4,5) Bravo® 6F 1.5 pt (6)	5.4 e	19.2 b	1.7 f	4,777 a	773 a
Bravo® 6F 1 pt + Folicur® 3.6F 7.2 fl oz (3,4,5)	40.8 bc	2.5 cd	16.7 bc	3,891 d	629 d
LSD (P=0.05)[w]	16.0	5.6	7.9	459	74

[z] 1 to 6 are 14-day applications made on 1=July 1, 2=July 15, 3=July 29, 4=Aug. 12, 5=Aug. 26, and 6=Sept. 9.

[y] Based on an average grade of 66 percent TSMK.

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

[w] Fisher's least significant difference (LSD).

treatments increased yield and crop value compared to the untreated check by at least 1,000 pounds per acre.

Evaluation of Fungicides and Reduced Fungicide Programs on Foliar Disease Control

The objective of this trial was to evaluate various full and reduced fungicide programs using fungicides—Bravo®, Headline®, Tilt®/Bravo®—and experimental fungicides Topguard®, DPX-Q8Y78. Fungicides were applied on a 14-day schedule beginning July 8 for the full-season program, and Aug. 5 for the reduced calendar program; or according to the MESONET Leaf Spot Advisory.

Leaf spot appeared in early September and increased to low levels in the untreated check at harvest. Disease development was not sufficient to cause measurable defoliation. The hot, dry weather in August and September, and the lack of a peanut crop in the field for the previous two years, contributed to the low disease levels. All of the fungicide programs reduced leaf spot to low levels. Disease control did not differ between fungicide treatments or application schedules. Disease levels were not sufficient to affect yield or crop value.

Table 14. Effect of fungicides and reduced fungicide programs on control of early leaf spot on Spanish-type peanuts (Tamnut OL06), Erick, 2010.

Treatment and Rate/A (timing)[z]	*Early Leaf Spot (%)*	*Yield (lbs/A)*	*Crop Value ($/A)*[y]
Check	34.6 a[x]	5,636 a	968 a
Bravo® 6F 1.5 pt (1-6)	2.0 b	5,536 a	951 a
Bravo® 6F 1.5 pt (1,3,5) Headline 2.08E 6 fl oz (2,4,6)	1.0 b	6,098 a	1,049 a
Bravo® 6F 1.5 pt (1,6) Topguard 1.04F 14 fl oz (2-5)	0.4 b	5,735 a	985 a
Bravo® 6F 1.0 pt + Topguard 1.04F 7 fl oz (3,4,5)	4.5 b	5,572 a	957 a
Bravo® 6F 1.0 pt + Topguard 1.04F 7 fl oz (A1-A3)	0.9 b	5,554 a	954 a
DPX-Q8Y78 2F 18 fl oz (3,4,5)	1.3 b	5,690 a	978 a
DPX-Q8Y78 2F 18 fl oz (A1-A3)	5.1 b	5,717 a	982 a
Headline® 2.08E 6 fl oz (3,5) TiltBravo 4.3SE 1.5 pt (4)	0.4 b	5,681 a	976 a
Headline® 2.08E 6 fl oz (A1,A3)			
Tilt®/Bravo® 4.3SE 1.5 pt (A2)	0.8 b	4,955 a	851 a
LSD (P=0.05)[w]	8.3	ns[v]	ns

[z] 1 to 6 are 14-day applications made on 1=July 8, 2=July 22, 3=Aug. 5, 4=Aug. 19, 5=Sept. 2, 6=Sept. 16; A1 to A3 are applications made on A1=July 8, A2=Aug. 5 and A3=Sept. 2, according to the MESONET Leaf Spot Advisory program.

[y] Based on an average grade of 71 percent TSMK.

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

[w] Fisher's least significant difference (LSD).

[v] NS = treatment effect not significant at P=0.05.

Peanut Variety Tests

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Department of Plant and Soil Sciences

2010 progress made possible through OPC and NPB support

- **Several new peanut varieties that look promising were evaluated in 2010.**
- **Red River Runner continues to perform well in most locations with high grades.**
- **Tamnut OL06 and AT 98-99-14 consistently performed well at most locations over the last several years.**

Variety Tests

All variety tests 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. Variety X location interaction was significant so the results were separated by county (Tables 15 to 17). 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). At planting, liquid inoculant formulation was applied with the seed. Tests were conducted using randomized, complete block design with five replications. The entire plot was dug, then thrashed three days to four days later. Peanuts were placed in a drier until moisture reached 10 percent. Total sound mature kernels was determined on a 200-gram sample from each plot.

Overview of the 2010 Production Year

In 2010, weather conditions were good for peanut production. Above normal rainfall in May delayed planting in some areas. In July, hot and dry weather developed in most of the peanut growing areas. Overall pod set was relatively uniform, and there was an excellent fall to mature and dry down the crop. Throughout the year disease pressure was normal. The hot, dry conditions in late July and early August reduced the threat of severe disease pressure.

Interpreting Data

Details of establishment and management of each test are listed in footnotes. Least significant differences (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, then it is 95 percent certain the yield difference is real, and 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 (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 and management conditions similar to those of the tests. The relative yields of all peanut varieties are affected by crop management and by environmental factors including soil type, summer conditions, soil moisture conditions, diseases and insects.

Beckham County

Good growing conditions were observed at Erick throughout the growing season. Early season precipitation was above normal, which delayed planting in some cases. The trial was planted May 24 into a strip-till seedbed. No significant foliar diseases were observed during the growing season. The only yield limiting disease that was observed in the plots was pod rot. Pod rot was most severe in the Virginia varieties.

Average yield for the runner test was 5,257 pounds per acre with an average grade of 72 percent (Table 15). No significant differences were observed among the runner varieties. Red River Runner and Flavor Runner 458 were the highest grading peanut varieties. The higher grades for these two varieties also were observed in 2009.

Average yield and grade for the Spanish test were 4,657 pounds per acre and 70 percent TSMK, respectively. In the Spanish test ARSOK-S1, Tamnut OL06 and Tamspan90 were the top yield performers. ARSOK-S1 is an experimental variety that has not been released at this time. Tamnut OL06 is high oleic and was released from TAMU in the spring of 2007. ARSOK-S1 and Tamnut OL06 routinely perform well in Beckham County.

Average yield and grade in the Virginia test was 3,786 pounds per acre and 67 percent TSMK, respectively. Yields and grades were lower than normal due to pod rot problems.

Caddo County

The trial at Fort Cobb was planted May 17 into a strip-till seedbed. Overall, growing conditions were good during the season at Fort Cobb. Average yield for the runner test was 4,145 pounds per acre with an average grade of 68 percent TSMK (Table 16). Tamrun OL02, GA-09B and Red River Runner were the top performing varieties in yield. Red River Runner had the highest grade in the trial.

Average yield and grade for the Spanish test were 3,887 pounds per acre and 66 percent TSMK, respectively. Spanco and ARSOK-S1 were the top yielding varieties.

Average yield and grade in the Virginia test was 3839 pounds per acre and 64 percent TSMK, respectively. Yield and grade were hurt by pod rot problems. However, GA-08V was clearly the best variety in 2010 in the Virginia test.

Hydro

This was the third year for a test location in Custer/Blaine counties. Good growing conditions were observed throughout the growing season. Early season precipitation was above normal, which delayed planting in some cases, the trial was planted May 5. Yields were excellent at this location. Average yield for the runner test was 6,787 pounds per acre with an average grade of 68 percent TSMK (Table 17). Tamrun OL07 performed very well at this location and graded similar to the other top yielding varieties.

Yields for the Spanish varieties were excellent—approaching yields for the runner varieties. Average yield and grade for the Spanish test were 5,940 pounds per acre and 65 percent TSMK, respectively. AT 98-99-14 and Spanco were the highest yielding varieties at this location. AT 98-99-14 has a runner growth habit but is typically graded as a Spanish and has consistently yielded well in this region.

Average yield and grade in the Virginia test was 6,128 pounds per acre and 67 percent TSMK, respectively. Pod rot incidence was high but yields were still good. Due to pod rot variability, a significant difference was not detected, but GA-08V performed well.

Love County

This was the first year for a test location in Love County. Good growing conditions were observed throughout the growing season. The trial was planted May 19 into a strip-till seedbed. Yields were good at this location. Average yield for the runner test was 4,569 pounds per acre with an average grade of 71 percent TSMK (Table 18). Red River Runner, Tamrun OL02, ARSOK-35-1 and GA-09B were the top yielding varieties. Red River Runner also had an exceptionally high grade, making it by far the most profitable variety in 2010.

Yields for the Spanish varieties were also good. Average yield and grade for the Spanish test were 3,985 pounds per acre and 63 percent TSMK, respectively. Spanco was the highest yielding variety at this location.

Average yield and grade in the Virginia test was 3,474 pounds per acre and 63 percent TSMK, respectively. Pod rot incidence was not as high as other locations but still present. GA-08V was by far the best performing variety in both yield and grade.

Table 15. Peanut yields, pod rot observations and grades from Beckham County variety tests, 2010.

Variety or Line	*Pod Rot (% of plot)*	*Yield (lbs/A)*	*Percent of Trial Average*	*Grade (% TSMK)[2]*	*Revenue ($/A)*
Runner[1]					
Tamrun OL02	<1	5,846	111	71.7	1,021
GA-09B	41	5,359	102	70.4	922
ARSOK-R35-1	28	5,358	102	69.9	912
Red River Runner	25	5,223	99	73.7	937
ARSOK-R29-3	11	5,081	97	71.3	882
Tamrun OL07	4	5,064	96	71.2	878
Flavor Runner 458	26	4,866	93	75.0	888
CV		10		5.4	
LSD 0.05	17	ns		ns	
Spanish[1]					
ARSOK-S1	2	5,501	118	69.9	932
Tamnut OL06	2	5,374	115	67.1	874
Tamspan 90	14	5,271	113	67.5	862
Spanco	16	4,683	101	74.8	848
AT 98-99-14	31	4,411	95	69.2	740
Olin	21	4,206	90	67.3	686
Pronto	19	3,970	85	72.7	699
GA-04S	36	3,839	82	68.7	639
CV		12.0		5	
LSD 0.05	10	706		4.3	
Virginia[1]					
N080701	1	5,059	120	72.1	945
Brantley	41	4,642	110	66.3	804
N08081	40	4,256	101	69.2	775
Champs	29	4,030	96	68.6	727
GA-08V	58	3,800	90	65.7	652
Jupiter	35	3,528	84	65.3	605
CV		16.0		3.4	
LSD 0.05	19	ns		2.9	

[1] Market type.

[2] Percent TSMK = Percent total sound mature kernels.

[3] Not significantly different at a probability level of 5 percent.

Table 16. Peanut yields, pod rot observations and grades from Caddo County variety tests, 2010.

Variety or Line	*Yield (lbs/A)*	*Percent of Trial Average*	*Grade (% TSMK)*[2]	*Revenue ($/A)*
Runner[1]				
Tamrun OL02	4,770	115	68.1	794
GA-09B	4,559	110	69.6	773
Red River Runner	4,519	109	71.7	789
Tamrun OL07	4,218	102	68.9	708
Flavor Runner 458	4,116	99	69.4	699
ARSOK-R29-3	3,675	89	65.2	584
ARSOK-R35-1	3,158	76	65.4	503
CV	10		2.6	
LSD 0.05	452		1.9	
Spanish[1]				
Spanco	4,527	116	67.4	743
ARSOK-S1	4,516	116	65.1	716
Tamspan 90	4,120	106	65.5	657
AT 98-99-14	3,989	103	65.8	642
Tamnut 06	3,881	100	64.2	607
Pronto	3,532	91	69.1	594
Olin	3,441	89	63.4	531
GA-04S	3,089	79	63.7	479
CV	11		2.4	
LSD 0.05	459		1.7	
Virginia[1]				
GA-08V	5,224	120	68.0	932
Jupiter	4,596	106	64.2	772
N08081	4,273	98	67.8	757
Brantley	4,080	94	64.3	686
Champs	3,599	83	62.7	590
CV	14		1.8	
LSD 0.05	706		1.3	

[1] Market type.
[2] Percent TSMK = Percent total sound mature kernels.
[3] Not significantly different at a probability level of 5 percent.

Table 17. Peanut yields, pod rot observations and grades from Blaine County variety tests, 2010.

Variety or Line	*Pod Rot (% of plot)*	*Sclerontia (% of plot)*	*Yield (lbs/A)*	*Percent of Trial Average*	*Grade (% TSMK)[2]*	*Revenue ($/A)*
Runner[1]						
Flavor Runner 458	4	18	7,184	106	70.0	1,224
Tamrun OL07	2	7	7,162	106	68.4	1,203
Tamrun OL02	<1	16	6,933	102	67.2	1,140
GA-09B	24	7.5	6,679	98	68.5	1,119
Red River Runner	<1	5	6,552	97	69.4	1,112
ARSOK-R35-1	2	6	6,512	96	67.8	1,080
ARSOK-R29-3	4	5	6,483	96	66.4	1,053
CV			12		3.8	
LSD 0.05	5	8	ns		ns	
Spanish[1]						
AT 98-99-14	2	0	6,803	115	64.9	1,084
Spanco	1	0	6,647	112	67.6	1,093
Tamspan 90	1	0	6,244	105	64.3	986
ARSOK-S1	1	0	5,982	101	64.4	938
Tamnut OL06	0	0	5,852	99	65.3	930
Olin	0	0	5,427	91	65.3	863
Pronto	3	0	5,329	90	66.5	863
GA-04S	2	0	5,235	88	62.3	802
CV			9		3.6	
LSD 0.05	2	ns	598		2.5	
Virginia[1]						
GA-08V	8	0	7,148	111	65.1	1,217
Jupiter	10	0	6,701	104	67.3	1,181
N08081	13	0	6,476	100	66.2	1,127
N080701	6	0	6,461	100	69.6	1,179
Brantley	11	0	6,077	94	66.4	1,057
Champs	10	0	5,844	91	64.7	990
CV			14		4.3	
LSD 0.05	ns	ns	ns		ns	

[1] Market type.

[2] Percent TSMK = Percent total sound mature kernels.

[3] Not significantly different at a probability level of 5 percent.

Table 18. Peanut yields, pod rot observations, and grades from Love County variety tests, 2010.

Variety or Line	*Yield (lbs/A)*	*Percent of Trial Average*	*Grade (% TSMK)*[2]	*Revenue ($/A)*
Runner[1]				
Red River Runner	5,118	112	75.5	941
ARSOK-R35-1	4,798	105	68.1	799
Tamrun OL02	4,760	104	70.0	811
GA-09B	4,746	104	73.4	848
ARSOK-R29-3	4,390	96	68.1	731
Tamrun OL07	4,309	94	69.5	729
Flavor Runner 458	3,862	85	71.7	674
CV	10		3.5	
LSD 0.05	536		2.7	
Spanish[1]				
Spanco	4,545	114	71.2	784
ARSOK-S1	4,287	108	68.2	708
AT 98-99-14	4,149	104	71.4	718
GA-04S	3,939	99	70.6	676
Tamnut OL06	3,888	98	65.9	621
Tamspan 90	3,848	97	69.7	650
Pronto	3,779	95	72.4	663
Olin	3,449	87	69.3	579
CV	11		2.4	
LSD 0.05	462		1.8	
Virginia[1]				
GA-08V	5,147	133	70.4	945
Jupiter	3,882	100	63.8	644
Champs	3,787	98	63.7	626
N08081	3,726	96	65.3	637
N080701	3,541	91	56.4	523
Brantley	3,155	81	67.4	554
CV	14		3.6	
LSD 0.05	603		2.6	

[1] Market type.
[2] Percent TSMK = Percent total sound mature kernels.
[3] Not significantly different at a probability level of 5 percent.

Long-term Averages

When making variety selection, it is always important to consider more than one year of data. This is especially true for peanut varieties due to the year to year variability observed in our climate. Tables 18, 19 and 20 contain multi years of data. Variety comparisons are easier when performed over multiple years.

Beckham County

Over the last four-year period, Tamrun OL07 and Red River Runner have performed the best out of the runner varieties tested (Table 19). These two varieties clearly perform the best in this region. The one advantage for Red River Runner compared to Tamrun OL07 is the higher grade. Over the four-year period Red River Runner has had 3 percent higher TSMK.

The Spanish varieties that have performed the best over the last four years have been Tamnut OL06, AT 98-99-14 and ARSOK-S1. ARSOK-S1 is an experimental variety that is not yet released. Grades of AT 98-99-14 and ARSOK-S1 tend to be higher than grades of Tamnut OL06.

All Virginia varieties tested have performed similarly. However, Brantley and Jupiter tend to yield higher in Beckham County.

Caddo County

Over the last four-year period in Caddo County, Red River Runner has performed the best out of the runner varieties tested (Table 20). Grades for Red River Runner have consistently been better compared to all other varieties. After one year of testing, GA-09B looks promising in Caddo County. Evaluations will continue for GA-09B.

The Spanish varieties that have performed the best over the last four years have been Spanco, AT 98-99-14 and ARSOK-S1. However, there has not been a lot of separation. Grades among these top performers have been similar.

All Virginia varieties tested have performed similarly. After one year of testing, GA-08V looks promising.

Custer County

Over the last three-year period in Custer County, Tamrun OL07 has performed the best out of the runner varieties tested (Table 21). Grades for Red River Runner have consistently been better compared to all other varieties. Tamrun OL07 seems to outperform Red River Runner when grown on tighter soils.

The Spanish variety that hasperformed the best over the last three years have been AT 98-99-14. Grades among these top performers has been similar.

Among the Virginia varieties, Jupiter appears to have a slight yield advantage. After one year of testing, GA-08V looks promising and evaluations will continue in the variety.

Additional Information on the Web

A copy of this publication, as well as a variety of information on peanut and soybean management, can be found at:

www.peanut.okstate.edu/

Appreciation is expressed for the cooperation and assistance from:

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Table 19. Peanut yields and grades from Beckham County variety tests in 2007 to 2010 and 4-year average.

	- - - - 2007 - - - -		- - - - 2008 - - - -		- - - - 2009 - - - -		- - - - 2010 - - - -		- - - - 4-year Avg. - - - -	
Runner[1]										
GA-09B	na	na	na	na	na	na	5,359	70.4	5,359	70
Tamrun OL07	5,838	74	5,710	76	4,229	74.0	5,064	71.2	5,210	74
Red River Runner	5,229	77	5,928	79	4,461	78.2	5,223	73.7	5,210	77
Southwest Runner	4,473	74	5,899	74	na[3]	na	na	na	5,186	74
Tamrun OL02	3,147	71	5,463	74	4,657	73.9	5,846	71.7	4,778	73
Flavor Runner 458	4,443	74	5,107	78	4,352	76.3	4,866	75.0	4,692	76
LSD 0.05	1,825	2	781	3	ns	1.5	ns	ns		
Spanish[1]										
ARSOK-S1	4,046	74	5,619	73	4,138	71.9	5,501	69.9	4,826	72
Tamnut OL06	4,029	73	5,961	71	3,939	70.6	5,374	67.1	4,826	70
AT 98-99-14	4,000	75	6,141	73	4,320	73.4	4,411	69.2	4,718	73
Spanco	3,740	76	5,616	69	3,684	74.3	4,683	74.8	4,431	74
Tamspan 90	3,323	74	5,140	72	3,576	72.2	5,271	67.5	4,328	71
GA 04S	3,766	71	5,147	65	na	na	3,839	68.7	4,251	68
OLin	2,998	74	4,828	71	3,530	72.1	4,206	67.3	3,891	71
Pronto	2,886	77	4,672	73	3,521	75.6	3,970	72.7	3,762	74
LSD 0.05	577	2	502	2	502	1.4	706			
Virginia[1]										
Gregory	4,866	69	5,173	70	3,975	70.3	na	na	4,671	70
Brantley	4,433	72	4,599	71	4,068	74.2	4,642	66.3	4,436	71
Jupiter	4,409	73	5,470	69	4,034	70.8	3,528	65.3	4,360	70
Champs	na	na	na	na	na	na	4,030	68.6	4,030	69
GA-08V	na	na	na	na	na	na	3,800	65.7	3,800	66
LSD 0.05	ns	1	ns	ns	ns	ns	ns	3		

[1] Market type.
[2] % TSMK = Percent total sound mature kernels.
[3] Data was not available because variety was not included in the table.

Table 20. Peanut yields and grades from Caddo County variety tests in 2007 to 2010 and 4-year average.

Variety or Line	*Yield (lbs/A)*	*Grade (% TSMK)*[2]	*Yield (lbs/A)*	*Grade (% TSMK)*	*Yield (lbs/A)*	*Grade (% TSMK)*	*Yield (lbs/A)*	*Grade (% TSMK)*	*Yield (lbs/A)*	*Grade (% TSMK)*
	- - - - 2007 - - - -		- - - - 2008 - - - -		- - - - 2009 - - - -		- - - - 2010 - - - -		- - - - 4-year Avg. - - - -	
Runner[1]										
GA-09B	na	na	na	na	na	na	4,559	69.6	4,559	70
Red River Runner	2,831	72	3,764	74	4,068	65.2	4,519	71.7	3,796	71
Tamrun OL02	2,323	68	3,311	68	3,717	60.7	4,770	68.1	3,530	66
Tamrun OL07	2,278	68	3,416	68	3,480	61.4	4,218	68.9	3,348	67
Flavor Runner 458	2,355	69	2,882	69	3,063	63.2	4,116	69.4	3,104	68
Southwest Runner	2,355	70	3,812	71	na[3]	na	na	na	3,084	70
LSD 0.05	374	2	352	3	779	ns	452	1.9		
Spanish[1]										
Spanco	2,314	70	3,539	67	3,467	64.7	4,527	67.4	3,462	67
ARSOK-S1	2,350	68	3,420	69	3,354	64.0	4,516	65.1	3,410	66
AT 98-99-14	2,804	70	3,224	65	3,006	65.8	3,989	65.8	3,256	67
Tamnut OL06	2,246	64	3,608	69	2,937	63.8	3,881	64.2	3,168	65
Tamspan 90	1,938	65	3,278	67	3,002	63.3	4,120	65.5	3,084	65
Pronto	1,788	72	3,184	66	3,093	59.6	3,532	69.1	2,899	67
OLin	1,593	68	3,325	70	3,118	65.2	3,441	63.4	2,869	67
GA 04S	1,661	63	2,556	62	na	na	3,089	63.7	2,435	63
LSD 0.05	521	4	477	3	414	ns	459	1.7		
Virginia[1]										
GA-08V	na	na	na	na	na	na	5,224	68.0	5,224	68
Champs	na	na	na	na	na	na	3,599	62.7	3,599	63
Jupiter	1,892	64	3,122	67	3,536	63.2	4,596	64.2	3,286	65
Brantley	1,974	68	2,820	66	3,292	64.1	4,080	64.3	3,042	66
Gregory	2,242	65	2,653	68	3,542	63.3	na	na	2,812	66
LSD 0.05	455	3	ns	ns	ns	ns	706	1.3		

[1] Market type.
[2] % TSMK = Percent total sound mature kernels.
[3] Data was not available because variety was not included in given year.

Table 21. Peanut yields and grades from Custer County variety tests in 2008 to 2010 and 3-year average.

Variety or Line	*Yield (lbs/A)*	*Grade (% TSMK)*[2]	*Yield (lbs/A)*	*Grade (% TSMK)*	*Yield (lbs/A)*	*Grade (% TSMK)*	*Yield (lbs/A)*	*Grade (% TSMK)*
	- - - - 2008 - - - -		*- - - - 2009 - - - -*		*- - - - 2010 - - - -*		*- - - - 3-year Avg. - - - -*	
Runner[1]								
Tamrun OL07	7,402	61	6,716	68.2	7,162	68.4	7,093	66
GA-09B	na[3]	na	na	na	6,679	68.5	6,679	69
Flavor Runner 458	6,360	66	6,135	66.0	7,184	70.0	6,560	67
Red River Runner	6,309	65	6,530	72.4	6,552	69.4	6,464	69
Tamrun OL02	5,340	59	6,559	68.9	6,933	67.2	6,277	65
LSD 0.05	1,456	4	735	3.8	ns	ns		
Spanish[1]								
AT 98-99-14	5,833	68	7,743	70.3	6,803	64.9	6,793	68
ARSOK-S1	5,612	68	7,106	68.4	5,982	64.4	6,233	67
Tamnut OL06	5,981	65	6,312	67.5	5,852	65.3	6,048	66
Spanco	4,879	70	6,240	65.8	6,647	67.6	5,922	68
OLin	5,961	70	6,248	69.9	5,427	65.3	5,879	68
Tamspan 90	5,122	67	5,550	68.0	6,244	64.3	5,639	66
Pronto	4,824	71	6,047	68.5	5,329	66.5	5,400	69
LSD 0.05	907	2	976	ns	598	2.5		
Virginia[1]								
GA-08V	na	na	na	na	7,148	65.1	7,148	65
Jupiter	6,236	63	6,636	65.9	6,701	67.3	6,524	65
Brantley	5,242	66	7,050	66.4	6,077	66.4	6,123	66
Gregory	5,485	61	6,443	67.5	na	na	5,964	64
Champs	na	na	na	na	5,844	64.7	5,844	65
LSD 0.05	ns	ns	435	ns	ns	ns		

[1] Market type.
[2] % TSMK = Percent total sound mature kernels.
[3] Data was not available because variety was not included in given year.

Evaluation of Disease Reaction and Agronomic Traits of Selected Peanut Entries

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Partners in Progress PEANUTS

2010 progress made possible through OPC and NPB support

- **At the Caddo Research Station, Fort Cobb, incidence of Sclerotinia blight was too low and variable to include data in this report during the 2010 peanut growing season.**
- **At the Caddo Research Station, Fort Cobb, incidence of southern blight was moderate that allowed useful disease reaction of peanut lines included in three studies during the 2010 peanut growing season.**
- **All Spanish and runner peanut breeding lines tested at the Caddo Research Station in 2010 are high oleic.**
- **Overall, grades of the Spanish peanut entries ranged from 61 percent to 66 percent. The advanced breeding line ARSOK-S1 graded at 63 percent, whereas the cultivar Tamnut OL06 graded at 61 percent, with an LSD of 3 at P=0.05.**
- **The 100 seed weight of the advanced breeding line ARSOK-S1 is 47.6 grams, which is significantly less than that of Tamnut OL06 at 49.5 grams.**
- **Incidence of Southern blight in ARSOK-S1 is 4.7 percent, which is not significantly different from that of Tamnut OL06 and Olin at 10.0 percent and 9.7 percent, respectively.**
- **Overall, grades of the runner-type peanut entries ranged from 56.4 to 72.3.**
- **The newly released Red River Runner had the highest significant (P=0.05) grade of 72.3 percent as compared with the rest of the runners in the test.**
- **Yields of the two high oleic runner cultivars Red River Runner and Tamrun OL07 were statistically (P=0.05) similar.**
- **The high oleic runner breeding line 143-3 had the lowest incidence of Southern blight at 1 percent.**
- **Four of the high oleic Spanish X runner breeding lines (008-1, 068-3, 140-1, and 140-3 had the lowest incidence of southern blight.**
- **The yield and grade of the breeding line 140-1 was similar to that of the regular oleic cultivar Okrun, but the 100 seed weight is considerably small at 46.8 grams.**

Our peanut improvement efforts are focused on enhancing yield, quality and disease resistance. Therefore, the major emphasis of this research project is to develop high oleic peanut cultivars possessing disease resistance, and high yield and grade. All the plot research reported here was performed at the Caddo Research Station. Weed management protocol was implemented, and a leaf spot fungicide advisory program was used to manage foliar diseases. All plots were irrigated as needed to ensure optimum moisture with a pivot system. All plots were planted May 11. Final disease evaluations were performed Sept. 21, and on Oct. 5 for the runner and Spanish X runner lines. Spanish plots were harvested Oct. 4, while the runners and the Spanish X Runner were harvested on Oct. 15. Also, yield and grade of all entries in the tests were determined under the prevailing environmental conditions in Oklahoma in 2010.

Objectives of the small field plot studies performed were:

- to determine the agronomic qualities and incidence of Sclerotinia blight and southern blight in field plots on selected Spanish type peanut lines,
- to determine the agronomic qualities and incidence of Sclerotinia blight and southern blight on selected runner-type peanut lines, and
- to determine the agronomic qualities and incidence of Sclerotinia blight and southern blight in selected Spanish X runner-type peanut lines.

Incidence of Sclerotinia blight in all field plots was too low and variable. Therefore, only southern blight disease incidence data were included in this report.

Performance of the Advanced Spanish Breeding Lines and Cultivars in 2010

Data of agronomic qualities and incidence of Southern blight in the 13 entries tested are presented in Table 22. Yields and grades among the high oleic lines were not significant at P=0.05. One hundred seed weight of ARSOK-S1 and Tamnut OL06 is significantly (P= 0.05) higher than that of Olin. Differences in the incidence of Southern blight among ARSOK-S1, Tamrun OL06, and Olin were not significant at P=0.05.

Performance of the Advanced Runner-type Breeding Lines and Cultivars in 2010

Data of agronomic qualities and incidence of southern blight in the 14 entries tested are presented in Table 23. The yield of the high oleic cultivars Red River Runner and Tamrun OL07 was not significantly (P=0.05) different at 3,759 pounds per acre and 3,436 pounds per acre, respectively. The breeding line 143-3 exhibited the lowest incidence of southern blight at 1 percent and had a yield similar to the two high oleic cultivars, Red River Runner and Tamrun OL07, but the grade was considerably low at 58.9 percent.

Performance of the Spanish X Runner-type Breeding Lines in 2010

Data of agronomic qualities and incidence of southern blight in the nine Spanish X runner entries tested are presented in Table 24. The incidence of southern blight in four of the Spanish X runner breeding lines was 4 percent, which is statistically (P=0.05) different from that of Tamspan 90 at 19 percent. Furthermore, breeding line 068-3 had zero incidence of southern blight. The yield and grade of the breeding line 140-1 was similar to that of the regular oleic cultivar Okrun, but the 100 seed weight is considerably small at 46.8 grams.

Further evaluations of all the peanut breeding lines discussed in this report will be conducted during the 2011 growing season at the Caddo Research Station.

Thanks to Doug Glasgow, Kenneth Jackson, and Lisa Myers of the USDA/ARS; and Bobby Weidenmaier and Mike Brantes of the Oklahoma Agricutlural Experiment Station, for providing technical support in conducting this field research.

Table 22. Agronomic qualities and incidence of southern blight in field plots of selected Spanish type peanut lines at the Caddo Research Station, 2010.

Entry	*Yield (lbs/A)*	*Grade*	*Hulls (%)*	*100 sdwt (g)**	*#/oz (>21)***	*So. Blight (%)*
Olin	1,839	61	29	38.6	62	9.7
ARSOK-S1	2,598	63	30	47.6	53	4.7
Tamnut OL06	2,307	61	32	49.5	51	10.0
Tamspan 90	2,775	65	29	45.7	54	3.3
099-2	2,146	63	30	37.6	63	0.0
00103	2,404	64	29	41.6	58	7.7
108-1	2,033	64	28	37.8	64	1.7
112-2	2,452	65	29	37.7	63	2.7
00113	2,178	63	29	36.9	65	4.3
00129	2,130	63	29	40.5	60	1.7
133-2	1,904	61	30	39.6	62	1.7
133-3	2,001	66	27	39.5	62	0.7
135-1	1,855	61	29	40.0	60	1.7
LSD (0.05)***	722	3.0	2	1.5	2.0	8.6

*Seed weight of graded kernels.

**Number of kernels (retained on 21/64 screen) per ounce.

***LSD (0.05) = Least significant difference at the 5 percent probability.

Table 23. Agronomic qualities and incidence of southern blight of selected runner-type peanut lines in field plots at the Caddo Research Station, 2010.

Entry	*Yield (lbs/A)*	*Grade*	*Hulls (%)*	*100 sdwt (g)*	*#/oz (>21)*	*So. Blight (%)*
Okrun	3,614	63.6	27	57.9	40.4	17
Tamrun 96	4,001	67.4	26	60.3	39.4	8
Red River Runner	3,759	72.3	22	66.3	36.2	4
Tamrun OL07	3,436	66.9	27	64.2	36.8	12
Southwest Runner	3,582	67.7	27	50.8	46.4	7
023-1	2,952	62.7	28	62.8	35.5	6
023-3	3,291	62.6	28	63.2	35.3	8
029-2	3,017	60.2	29	63.7	35.2	7
029-3	3,001	64.1	28	65.3	35.7	4
032-1	2,969	64.8	27	65.5	34.8	10
036-1	3,130	63.3	29	64.7	35.8	4
143-1	3,178	61.9	30	47.6	48.3	2
143-2	3,243	56.5	32	47.1	48.4	2
143-3	3,695	58.9	30	47.5	49.2	1
LSD (0.05)*	523	4.1	2	3.8	1.8	10

*LSD (0.05) = Least significant difference at the 5 percent probability.

Table 24. Agronomic qualities and incidence of southern blight in field plots of selected Spanish X runner-type peanut lines at the Caddo Research Station, 2010.

Entry	*Yield (lbs/A)*	*Grade*	*Hulls (%)*	*100 sdwt (g)*	*#/oz (>21)*	*So. Blight (%)*
Okrun	3,727	62.6	27	57.2	40.7	12
Southwest Runner	3,566	63.6	27	51.9	45.6	9
ARSOK-S1	3,065	65.1	28	50.4	49.1	10
Tamspan 90	2,468	63.7	27	47.8	50.3	19
008-1	2,856	58.5	34	61.8	39.3	4
00058	2,243	55.4	35	53.0	38.2	8
068-3	3,082	59.8	34	64.0	37.8	0
140-1	3,678	64.9	28	46.8	50.2	3
140-3	3,178	57.7	34	64.3	37.6	2
LSD (0.05)*	545	5.4	2	6.9	1.8	13

*LSD (0.05) = Least significant difference at the 5 percent probability.

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