



# DISEASE EVALUATIONS AND AGRONOMIC TRAITS OF ADVANCED PEANUT BREEDING LINES IN 2020

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## 2020 Progress Made Possible Through Oklahoma Peanut Commission and National Peanut Board Support

- A total of 34 breeding lines and reference cultivars were evaluated at the Caddo Research Station for agronomic characteristics and soilborne diseases (Sclerotinia blight and pod rot).
- The runner trial included Lariat, Tamrun OL11, FloRun '107', eight breeding lines from the United States Department of Agriculture-Agricultural Research Service (USDA-ARS) and one International Peanut Group (IPG) breeding line. The Spanish/Valencia trial tested OLé, Schubert, Span-17, Valencia C, two USDA-ARS Spanish breeding lines and two New Mexico State University Valencia breeding lines. The Virginia trial evaluated 14 entries: Jupiter, ACI 351, Contender, Venus, Walton, IPG 464 and eight breeding lines from North Carolina State University.
- The Spanish/Valencia plots were dug 131 days after planting (DAP). Runner and Virginia plots were dug 170 DAP. Environmental conditions in September and October were favorable for Sclerotinia blight. Low levels of pod rot were observed in the advanced breeding line/cultivar trial.
- Numerically, the top two runner entries for revenue were Lariat (\$992 per acre) and ARSOK-R92-13 (\$925 per acre). ARSOK breeding line R96-8 had the least Sclerotinia blight at 7%. In contrast, the susceptible control, FloRun '107', had 54% disease.
- For the Spanish/Valencia entries, ARSOK-S96-5 (\$629 per acre), Span-17 (\$624 per acre) and ARSOK-S88-2 (\$615 per acre) had the highest numerical crop values. Span-17 had relatively low but significantly more Sclerotinia blight than other entries.
- In the Virginia trial, the three highest numerical crop values were from Contender, NC17EX and Jupiter (\$895, \$830 and \$830 per acre, respectively). No significant differences in Sclerotinia blight were observed. The Virginia entries had significant differences in pod sizes (number per ounce) and distribution of pod size classes by weight.
- Eight Virginia entries were tested in the pod rot nursery: Jupiter, ACI 351, Contender, IPG 464, NC1EX, NC2EX, NC7EX and NC17EX. Moderately high levels of pod rot were observed, but there were no significant differences among the entries.

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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 2020, we evaluated commercial and advanced breeding lines of runner, Spanish/Valencia and Virginia peanuts in small plots at Oklahoma State University's Caddo Research Station in Fort Cobb. The objectives of these field studies were: 1) to compare advanced breeding lines to commercially available cultivars for agronomic characteristics (e.g., yield and seed grade) and resistance to soilborne diseases and 2) to evaluate a selection of Virginia entries for pod rot resistance in fields where soilborne levels of the pathogens causing peanut pod rot were promoted by planting susceptible genotypes.

## Methods and Field Conditions for Evaluating Advanced Breeding Lines and Cultivars

A total of 34 breeding lines and reference cultivars (12 runner, eight Spanish/Valencia and 14 Virginia market types) were evaluated. Runner and Virginia peanut market types were each grown and evaluated separately, but Spanish and Valencia entries were combined in the same field and analyzed together. All advanced breeding lines were high oleic. Each entry was planted at a density of five seeds/ft in plots consisting of two 15-foot long rows with 36-inch-wide beds. A randomized complete block design was used by dividing the field into four sections (blocks) to account for potential disease gradients and environmental variables. All plots were planted on May 18. The Spanish/Valencia entries were dug on Sept. 25 – 131 days after planting – and threshed on Sept. 29. The runner and Virginia fields were dug 170 days after planting on Nov. 3 and threshed on Nov. 5 and 6.

Due to limited inoculum, three of the four blocks were inoculated with pure sclerotia of *Sclerotinia minor* on Aug. 31. Fields were managed for weeds, foliar diseases and southern blight (caused by *Athelia rolfsii*), following extension recommendations, but were not managed for Sclerotinia blight, pod rot or nematodes. Environmental conditions in 2020 were favorable for Sclerotinia blight due to cooler-than-average temperatures in September and October, in addition to above-average precipitation in September (Table 1). Additional water (0.5 inches to 1 inch) was applied to the plots 20 times between June 2 and Sept. 18 using a center pivot system.

Ratings for Sclerotinia and southern blights were collected on Sept. 18 in the Spanish/Valencia plots and on Oct. 2 for the Virginia and runner plots. Disease incidence was measured by counting the number of 6-inch sections within each plot that had symptoms of Sclerotinia blight and southern blight. Little southern blight was observed. Spanish/Valencia plots were examined for pod rot three days after digging; Virginia and runner plots were rated for pod rot within three hours of digging.

Peanut grades were determined following USDA-Agricultural Marketing Service guidelines using one 200-gram samples from each plot. One 500-gram sample per plot was used to determine pod sizes in the Virginia entries. Yield was adjusted by factoring in the area lost by plots in the path of the center pivot wheels. Data were analyzed using one-way ANOVA in PROC GLIMMIX of SAS (ver. 9.4). The Type I error rate for pairwise comparisons of breeding lines and cultivars was controlled at  $\alpha = 0.05$ , using the ADJUST=SIMULATE option.

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## Performance of the Runner Market Type Entries

Twelve runner peanut entries were evaluated (Table 2): high-oleic cultivars Lariat, Tamrun OL11 and the Sclerotinia blight-susceptible FloRun '107', eight breeding lines from the ARS-Stillwater peanut program and one breeding line from Dylan Wann (International Peanut Group, Brownfield, Texas).

Statistical differences were found among runner entries for crop value, yield and all shelling characteristics. Numerically, the top two runner entries for revenue and yield were Lariat (\$992 and 6,014 pounds per acre) and ARSOK-R92-13 (\$925 and 5,602 pounds per acre). The lowest crop value and yield were obtained from FloRun '107' (\$651 and 4,054 pounds per acre). Breeding line ARSOK-R90-12 had the highest grade at 71.9%, and ARSOK-R96-8 had the lowest grade at 62.6%. ARSOK-R96-8 was most resistant to Sclerotinia blight with 6.7% disease incidence, and the susceptible control cultivar FloRun '107' and IPG breeding line 08-1-0016 were least resistant.

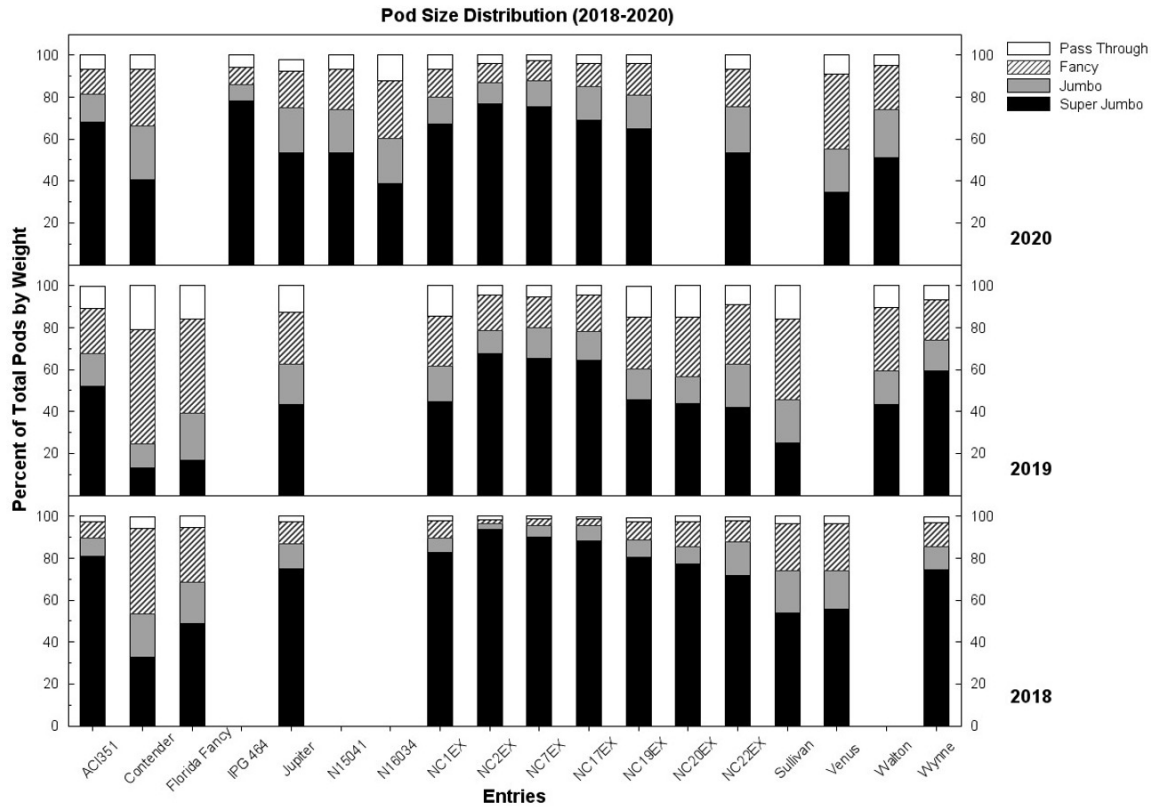
## Performance of the Spanish/Valencia Market Type Entries

Two Spanish breeding lines from ARS-Stillwater and two Valencia lines from Naveen Puppala (New Mexico State University) were evaluated in addition to cultivars Valencia C, OLé, Schubert and Span-17. The 2020 contract price for Valencia peanuts was \$750 per ton (Puppala, personal communication), but all entries were analyzed using the Spanish contract price of \$475 per ton to facilitate comparisons. Significant differences among the Spanish and Valencia entries were found for all agronomic characteristics except visibly damaged kernels (Table 2). ARSOK-S96-5 produced the highest value crop and yield (\$629 and 4,477 pounds per acre) and was significantly greater than the three Valencia entries. Span-17 and ARSOK-S88-2 had the highest seed grade, both at 65%, which was significantly greater than AROSOK-S96-5 at 59%. Little Sclerotinia blight was observed, but Span-17 had more disease than the other entries.

## Performance of the Virginia Market Type Entries

A total of 14 Virginia peanut entries were evaluated (Tables 3 and 4): Jupiter and high-oleic cultivars ACI 351, Contender, Venus, Walton and IPG 464; six early-maturing lines from Thomas Isleib (NCEX series, North Carolina State University); and two early-maturing lines from Jeffrey Dunne (N15041 and N16034, also NCSU). The Virginia entries differed statistically except in incidence of Sclerotinia blight, percentage small seed and visibly damaged kernels (Table 3). Numerically, the top three entries for crop value and yield were Contender (\$895 and 5,421 per acre), NC17EX (\$830 and 5,112 per acre) and Jupiter (\$830 and 5,251 per acre). N16034 was significantly lower in grade than the other entries. Significant differences in number of pods per ounce were found for all categories of pod sizes (Table 4), as well as the distribution of pod sizes by weight (Figure 1).

**Figure 1. Distribution of Virginia pod sizes by weight from the advanced breeding line/ cultivar trials in 2018 to 2020.**



## Average Performance over the Past Three Years (2018-2020)

Seven runner, five Spanish and nine Virginia entries were evaluated from 2018 to 2020 (Table 5). In 2018, harvest dates for the runner, Spanish and Virginia plots were 141, 130 and 147 days after planting, respectively. In 2019, all market types experienced a severe early freeze before being harvested 162 days after planting. Little Sclerotinia blight was present in 2019.

When data from multiple years were combined, significant differences in Sclerotinia blight, yield and grade were found among the runner entries. All entries were better than the susceptible control, FloRun '107', in Sclerotinia resistance. The highest numerical yields were obtained from Lariat and ARSOK-R92-13. Seed grades for ARSOK-R90-12 were significantly greater than FloRun '107' and ARSOK-R93-10. Among the Spanish entries, Span-17 had significantly more Sclerotinia blight than other entries. No statistically significant differences were observed among entries in yield, but Span-17 had better seed grade than Schubert and OLé. The nine Virginia entries were not significantly different in Sclerotinia blight. NC17EX had the highest numerical yield at 4,792 pounds per acre, which was greater than NC7EX and NC22EX. The grades obtained from NC7EX and NC17EX were significantly higher than Jupiter.

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## Pod Rot Nursery Results

For the pod rot nursery, a total of eight Virginia entries (ACI 351, Contender, Jupiter, IPG 464, NC1EX, NC2EX, NC7EX and NC17EX) were evaluated in a field where moderately high levels of pod rot were observed in 2017 (Table 6) and where pod rot-susceptible germplasm lines are planted every three years. The field was planted on May 18, using a randomized complete block design with four blocks. Plots were managed for leaf spots, Sclerotinia and southern blights and were irrigated identically to the advanced line/cultivar plots. Plots were dug on Oct. 16, 152 days after planting, and evaluated for pod rot within three hours after digging by estimating the percentage of discolored pods. Moderately high levels of pod rot were observed (Table 6), but no significant differences were found among the Virginia entries. Numerically, NC17EX and Jupiter had the highest levels of pod rot at 54% and 53%, respectively. Entries with numerically less pod rot included NC2EX and NC17EX, both at 36%.

## Additional Acknowledgments

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**Table 1. Monthly air temperature and rainfall for 2020 field season at the Caddo Research Station in Fort Cobb, Oklahoma from Mesonet.**

Month	Daily Mean	Departure from 15-Year Average	Total	Departure from 15-Year Average
	___ Air Temperature (°F) ___		___ Rainfall (Inches) ___	
May 18-31 <sup>1</sup>	70.8	-1	0.96	-1.97
June <sup>2</sup>	78.8	0	1.15	-2.82
July <sup>2</sup>	81.9	0	3.62	0.91
August <sup>2</sup>	79.0	-1	0.85	-2.64
September	69.5	-4	4.65	1.88
October <sup>2</sup>	57.0	-4	2.21	-0.67
November 1-3	53.2	-	0	-

<sup>1</sup> Mean temperature and rainfall are for May 18 (planting date) to May 31 and Nov. 1-3 (last digging date). Departure from 15-year average includes all days in May.

<sup>2</sup> Data from some days is not available due to incomplete Mesonet records.



**Table 2. Yield, grade, Sclerotinia blight, and shelling characteristics in advanced runner and Spanish/Valencia breeding lines and commercial cultivars planted at the Caddo Research Station in Fort Cobb, Oklahoma on May 18, 2020.<sup>1</sup>**

Entry	Revenue (\$/A) <sup>2</sup>	Yield (lbs/A)	Grade <sup>3</sup>	Sclerotinia <sup>4</sup>	100-Seed (g)	ELK (%) <sup>5</sup>	Medium (%) <sup>5</sup>	Small (%) <sup>5</sup>	VDK (%) <sup>5</sup>	Hull (%)
<b>Runner</b>										
Lariat	992a	6014a	69.7a	28.8a-c	68.0bc	34.9b	29.3bc	2.9b	0.4ab	25.5b
ARSOK-R92-13	925ab	5602ab	69.3a	27.9a-c	73.9ab	41.3ab	20.5c	3.9ab	0.7ab	26.4b
ARSOK-R90-12	862a-c	5060ab	71.9a	24.4a-c	71.4a-c	39.8ab	24.2bc	3.6ab	0.3ab	24.1b
Tamrun OL11	850a-c	5106ab	70.1a	19.6bc	65.8bc	35.5b	29.8bc	3.8ab	0.2b	25.8b
ARSOK-R93-1	838a-c	5009ab	70.1a	28.7a-c	69.6bc	40.2ab	22.6bc	3.2b	0.4ab	25.1b
ARSOK-R95-1	825a-c	5118ab	68.0ab	22.5bc	71.0a-c	32.5bc	27.8bc	3.1b	0.2b	27.3b
ARSOK-R96-8	820a-c	5518ab	62.6b	6.7c	78.7a	50.4a	6.3d	2.4b	0.6ab	33.7a
ARSOK-R91-2	817a-c	4937ab	69.8a	32.4a-c	73.7ab	43.8ab	21.6bc	2.9b	0.4ab	26.4b
ARSOK-R93-10	804a-c	5058ab	66.9ab	23.8bc	62.3c	31.2bc	28.6bc	3.4ab	1.4a	27.2b
IPG 08-1-0016	759a-c	4659ab	68.4ab	41.5ab	51.1d	17.8c	42.6a	6.3a	0.3b	26.9b
ARSOK-R94-4	717bc	4441b	68.0ab	30.0a-c	74.5ab	42.5ab	20.2c	2.7b	0.6ab	27.6b
FloRun '107'	651c	4054b	67.5ab	53.5a	62.0c	29.1bc	30.9b	5.3ab	0.8ab	27.5b
<b>Spanish/Valencia</b>										
ARSOK-S96-5	629a	4477a	59.3b	0b	50.3a	42.4a	10.3d	3.8c	0.4	37.2a
Span-17	624a	4054ab	64.8a	9.2a	45.5b	32.3b	23.5c	6.9b	0.1	31.0c
ARSOK-S88-2	615ab	4005ab	64.7a	0b	39.0c	30.9b	23.7bc	6.9b	0.4	31.7bc
OLé	582ab	3872ab	63.3ab	0b	41.3bc	29.2bc	23.6bc	8.0ab	0.1	33.4a-c
Schubert	523a-c	3535a-c	62.4ab	0b	42.0bc	24.3cd	29.1a	8.0ab	0.5	33.4a-c
Valencia C	441bc	3061bc	61.1ab	0b	42.1bc	21.5d	28.1ab	9.8a	0.3	35.3ab
New Mexico-M2 (Val)	397c	2626c	63.5ab	0b	42.3bc	22.2d	30.5a	10.0a	0.2	31.7bc
New Mexico-M7 (Val)	392c	2602c	63.3ab	0b	41.9bc	22.2d	30.9a	9.0ab	0.2	32.2bc

<sup>1</sup> Market types were analyzed separately and are ordered by highest to lowest contract revenue per acre. Spanish/Valencia plots were dug on Sept. 25 (131 days after planting, DAP); runners were dug Nov. 3 (170 DAP). Numbers with the same lowercase letter within columns for each market type are not significantly different ( $\alpha = 0.05$ ). No differences among entries if letters absent in column.

<sup>2</sup> Based on a contract price per ton of \$475 for all market types, but actual contract price for Valencia was \$750/ton. Calculations do not include deductions for excess splits or damaged and other kernels.

<sup>3</sup> Grade = percent total sound mature kernels + sound splits.

<sup>4</sup> Incidence of Sclerotinia blight rated on Sept. 24 for Spanish and Oct. 2 for runners.

<sup>5</sup> Screen sizes: ELK, extra-large kernels, 21/64 for runner, 19/64 for Spanish/Valencia; medium kernels, 18/64 for runner, 17/64 for Spanish/Valencia; small kernels, 16/64 for runner, 15/64 for Spanish/Valencia; VDK, visibly damaged kernels.



**Table 3. Yield, grade, Sclerotinia blight, and shelling characteristics of advanced Virginia breeding lines and commercial cultivars planted at the Caddo Research Station in Fort Cobb, Oklahoma on May 18, 2020.<sup>1</sup>**

Entry	Revenue (\$/A) <sup>2</sup>	Yield (lbs/A)	Grade <sup>3</sup>	Sclerotinia <sup>4</sup>	100-Seed (g)	ELK (%) <sup>5</sup>	Medium (%) <sup>5</sup>	Small (%) <sup>5</sup>	VDK (%) <sup>5</sup>	Hull (%)
<b>Virginia</b>										
Contender	895a	5421a	69.5a	30.0	92.6c-f	54.7ab	10.3e-g	2.0	0.5	28.3c
NC17EX	830ab	5112a	68.2a	38.3	100.8a-d	48.3a-d	14.0c-f	2.8	0.7	29.3bc
Jupiter	830ab	5251a	66.6a	36.4	85.0e-g	44.3a-e	18.3bc	2.5	0.5	31.9b
NC1EX	786ab	4931a	67.3a	27.5	97.2b-e	42.6b-e	17.4cd	3.3	0.6	29.7bc
NC19EX	776ab	4780ab	68.3a	33.8	103.1a-d	53.9a-c	10.0e-g	2.3	0.6	29.7bc
ACI 351	762ab	4876ab	65.9a	41.3	93.3b-f	44.2a-e	16.9c-e	3.4	0.3	32.3b
NC2EX	747ab	4701ab	66.8a	32.7	111.5a	55.0a	7.4g	1.5	0.8	31.1bc
IPG 464	741ab	4622ab	67.6a	48.3	106.1a-c	54.5ab	8.3fg	2.3	0.7	30.6bc
Venus	739ab	4707ab	66.2a	22.9	78.3fg	34.1ef	27.2a	3.5	0.4	31.2bc
NC7EX	729ab	4441ab	69.2a	40.8	108.9ab	56.1a	9.1e-g	1.5	0.3	29.0bc
N15041	694a-c	4433ab	65.7a	25.5	88.1d-g	39.8d-f	19.2a-c	3.8	0.2	31.2bc
NC22EX	640b	4041ab	66.7a	40.0	98.7a-e	42.4b-e	16.2c-f	3.5	0.3	30.4bc
Walton	638b	4054ab	66.4a	30.0	82.4fg	41.7c-e	18.1b-d	3.5	0.3	31.8bc
N16034	492c	3606b	57.4b	35.8	73.4g	26.4f	25.5ab	3.2	1.1	38.0a

<sup>1</sup> Entries sorted from highest to lowest contract revenue per acre. Plots dug on Nov. 3 (170 days after planting). Numbers with the same lowercase letter within columns for each market type are not significantly different ( $\alpha = 0.05$ ). No differences among entries if letters absent in column.

<sup>2</sup> Based on contract price of \$475/ton. Calculations do not include deductions for excess splits or damaged and other kernels.

<sup>3</sup> Grade = percent total sound mature kernels + sound splits.

<sup>4</sup> Incidence of Sclerotinia blight rated on Oct. 2.

<sup>5</sup> Screen sizes: ELK, extra-large kernels, 21.5/64; medium kernels, 18/64; small kernels, 15/64; VDK, visibly damaged kernels





**Table 4. Pod size characteristics (number per ounce) in advanced Virginia breeding lines and commercial cultivars planted at the Caddo Research Station in Fort Cobb, Oklahoma on May 18, 2020.<sup>1</sup>**

Entry	Super Jumbo(no./oz) <sup>2</sup>	Jumbo(no./oz) <sup>2</sup>	Fancy(no./oz) <sup>2</sup>	Pass Through (%) <sup>3</sup>
<b>Virginia</b>				
Jupiter	11.0a-c	13.4d-f	19.5ab	5.9bc
ACI 351	11.1a-c	15.9a-d	25.2a	6.5a-c
Contender	9.3c	11.4f	15.3b	6.6a-c
IPG 464	10.1bc	17.8a	24.7a	5.9bc
N15041	10.7a-c	13.8b-f	20.2ab	7.1a-c
N16034	12.4a	14.3b-f	18.8ab	12.0a
NC1EX	9.6c	14.6b-e	23.6a	6.7a-c
NC2EX	9.4c	16.6ab	25.0a	4.1c
NC7EX	9.6c	16.4a-c	26.0a	2.5c
NC17EX	9.5c	14.0b-f	25.0a	4.1c
NC19EX	9.3c	12.2ef	19.7ab	4.1bc
NC22EX	9.8bc	12.8d-f	19.7ab	6.5a-c
Venus	11.5ab	13.4c-f	17.7ab	9.0ab
Walton	10.6bc	12.9d-f	18.2ab	5.1bc

<sup>1</sup> Entries sorted from highest to lowest contract revenue per acre from Table 3. Plots dug on Nov. 3 (171 days after planting). Numbers with the same lowercase letter within columns for each market type are not significantly different ( $\alpha = 0.05$ ).

<sup>2</sup> Number of pods per ounce for pods riding slotted screens sized for super jumbo (40/64 x 3-inch slots), jumbo (37/64 x 3 inches), fancy (32/64 x 3 inches). Pass-through pods fit through 32/64 x 3-inch screen.

<sup>3</sup> Percentage of pods by weight.



**Table 5. Three-year averages for Sclerotinia blight, yield (pounds per acre), and seed grade in advanced breeding lines and commercial cultivars at the Caddo Research Station in Fort Cobb, Oklahoma (2018-2020).<sup>1</sup>**

Entry	2018-2020			2018			2019			2020		
	SM <sup>3</sup>	Yield	Grade	SM <sup>3</sup>	Yield	Grade	SM <sup>3</sup>	Yield	Grade	SM <sup>3</sup>	Yield	Grade
<b>Runner</b>												
Florun '107'	69.5a	4011b	68.2c	85.4a	4949	70.7	—	—	—	53.5a	4054b	67.5
Lariat	30.2b	5009a	71.3a-c	31.7d	5141	73.7	—	3872	70.6a	28.8b	6014a	69.7
Tamrun OL11	28.1b	4521ab	71.6ab	36.7dc	4899	74.3	—	3557	70.5a	19.6b	5106ab	70.1
ARSOK-R90-12	30.7b	4659ab	72.5a	42.1b-c	5360	75.2	—	3509	71.1a	24.6b	5602a	69.3
ARSOK-R92-13	44.2b	4959a	71.2a-c	60.4a-c	5462	74.5	—	3812	69.9ab	27.9b	5058ab	66.9
ARSOK-R93-10	31.7b	4622ab	69.2bc	39.6b-d	5179	74.8	—	3630	66.1b	23.8b	4441b	68.0
ARSOK-R94-4	47.1b	4598ab	69.8a-c	64.2ab	5324	74.4	—	4029	67.1ab	30.0b	5070ab	71.7
<b>Spanish</b>												
OLé	0b	4047	65.3bc	0	5082	68.6b	—	3187	64.2bc	0b	3872	63.3ab
Schubert	0b	4042	62.7c	0	5239	63.3c	—	3351	62.3c	0b	3535	62.5ab
SPAN 17	9.6a	4066	68.9a	10	5155	73.5a	—	2989	68.4a	9.2a	4054	64.8a
ARSOK-S88-2	0b	4170	66.2ab	0	5300	68.1b	—	3207	65.7a-c	0b	4005	64.7a
ARSOK-S96-5	1.0b	4123	67.1ab	2.1	5143	73.8a	—	2750	68.2ab	0b	4477	59.3b
<b>Virginia</b>												
ACI 351	50.2	4224a-c	68.3ab	59.2	4366b	69.2ab	—	3521	70.2ab	41.3	4876	65.9
Contender	39.4	4695ab	69.7ab	48.8	5493a	72.7a	—	3170	66.9ab	30.0	5421	69.5
Jupiter	51.4	4641ab	67.1b	70.0	4659ab	68.3b	—	3848	65.1b	36.4	5251	66.6
NC1EX	38.2	4474a-c	69.4ab	48.3	5058ab	71.7ab	—	3422	69.4ab	27.5	4931	67.3
NC2EX	44.5	4256a-c	69.4ab	56.7	4804ab	71.3ab	—	3267	71.1ab	32.7	4701	66.8
NC7EX	49.8	4118bc	70.9a	58.7	4646ab	71.4ab	—	3267	72.3a	40.8	4441	69.2
NC17EX	46.7	4792a	70.7a	52.1	5554a	72.4a	—	3836	72.3a	38.3	5112	68.2
NC19EX	53.1	4364a-c	69.6ab	72.5	4949ab	71.3ab	—	3364	69.2ab	33.8	4780	68.3
NC22EX	52.1	3972c	68.6ab	64.2	4707ab	71.6ab	—	3168	67.7ab	40.0	4041	66.7

<sup>1</sup> 2018 plots harvested 130 days after planting (DAP) for Spanish, 141 DAP for runners, and 147 DAP for Virginia. All 2019 plots harvested 162 DAP. 2020 plots harvested 131 DAP for Spanish and 170 DAP for runners and Virginias. Market types were analyzed separately. Numbers with the same lowercase letter within columns for each market type are not significantly different ( $\alpha = 0.05$ ).

No differences among entries if letters absent in column.

<sup>2</sup> Grade = percent total sound mature kernels + sound splits.

<sup>3</sup> SM, percent incidence of Sclerotinia blight. No Sclerotinia ratings taken in 2019 due to unfavorable conditions and a severe early freeze.



**Table 6. Pod rot in Virginia entries planted in the pod rot nursery and cultivar/advanced breeding line trial at the Caddo Research Station in Fort Cobb, Oklahoma in 2019 and 2020.<sup>1</sup>**

Entry	Pod Rot (%) <sup>2</sup>		
	2020 Pod Rot Nursery	2019 Cultivar/ Breeding Lines	2019 Pod Rot Nursery
Jupiter	52.2	42.5	42.9a
ACI 351	48	27.5ab	31.3a-c
Contender	45	23.8ab	37.5ab
Florida Fancy	-	28.8ab	-
IPG 464	50.5	-	-
NC1EX	40	18.8b	14.3de
NC2EX	35.9	9.0b	23.8b-e
NC7EX	53.8	26.8ab	-
NC17EX	36.2	18.0b	13.5e
NC19EX	-	13.0b	-
NC20EX	-	14.3b	-
NC22EX	-	9.3b	-
Sullivan	-	22.5ab	15.5c-e
Walton	-	13.0b	-
Wynne	-	23.8ab	30.0a-d

<sup>1</sup> Numbers with the same lowercase letter within columns for each market type are not significantly different ( $\alpha = 0.05$ ).

<sup>2</sup> Percentage of pods with symptoms of pod rot estimated within 3 days after digging.