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Comparison of Yield, Maturity, Value and Susceptibility to TSWV in Virginia- and Runner-type Varieties of Peanut in 2004

P.M. Phipps, Professor and Extension Specialist, Tidewater Agricultural Research and Extension Center
D.L. Coker, Research Scientist, Tidewater Agricultural Research and Extension Center
J.C. Faircloth, Assistant Professor and Extension Cotton/Peanut Specialist, Tidewater Agricultural Research and Extension Center

The field site was Nansemond fine sandy loam that was planted to wheat in 2003, corn in 2002, and peanuts in 2001. Varieties were replicated in four randomized complete blocks, and plots were two 35-foot rows spaced 3 feet apart.

Vapam 42 percent was applied 8 inches under each row with a coulter and trailing chisel shank on 17 Apr. Disks and a bed shaper produced smooth beds measuring 24 inches wide and 4 inches high over the treated rows. All plots, including an additional section for assessing the maturity of varieties, were planted on 7 May at a rate of ca. 3.5 seed/foot of row. Temik 15G was applied at planting to the seed furrow and a broadcast spray of Orthene 97 at 10 oz/A was applied on 4 June for supplemental thrips control. All varieties were treated with granular 420 landplaster at 1,200 lb/A on 9 June. Thereafter, standard practices for production of runner- and virginia-type peanuts were followed throughout the growing season.

The maturity of varieties was assessed on 20 September using a pod blaster to determine the color of mesocarp tissue. Pods with brown to black mesocarp were considered mature. The incidence of tomato spotted wilt virus (TSWV) and other diseases was monitored during the growing season. Peanuts were inverted in windrows on 18 Oct., and twenty taproots each from three virginia- and three runner-type varieties were tested for TSWV by immunostrip assays (Agdia, Elkhart, Ind.).

Virginia-type varieties were harvested with a two-row combine on 22 Oct. and runner-varieties were harvested on 29 Oct. Yield was determined after drying and adjusting the weight of whole pods to 7 percent moisture. A composite sample of pods from four replicates of each variety was graded by Federal-State Inspection Service methods to estimate market value.

Rainfall in May, June, July, Aug., and Sept. was 0.95, 0.83, 6.62, 5.23, and 0.67 inches above normal, respectively. Rainfall during the period totaled 38.55 inches, which was 14.3 inches above normal. Maximum and minimum air temperatures each month averaged within 2°F of normal, except May when the maximum and minimum averaged 6°F and 7°F above normal and Aug. when the minimum averaged 3°F above normal according to records from a NOAA station 4 miles northwest of the test site. No irrigation was applied.

Plant populations on 24 May averaged 1.79 plants/foot of row and the range among varieties was from 1.42 to 2.17 plants/foot (Table 1). Symptoms of TSWV were first recognized on 5 June when the average of counts for varieties ranged from 0 to 2 plants/plot. Numbers of symptomatic plants increased dramatically in several varieties by 9 July and 28 July, especially in virginia-type varieties. Ratings of disease severity were made on 10 Sept. instead of counting symptomatic plants, because of the difficulty in distinguishing TSWV and Cylindrocladium black rot (CBR) symptoms.

As a group, the virginia types exhibited higher susceptibility to TSWV than the runner types. The runner types having significant disease resistance included ANorden, DP-1, Georgia Green, Georgia-02C, Hull, GA-03L, AP-3, and C99R. Among the virginia-type varieties, Georgia Hi O/L and N01013 exhibited potentially useful levels of disease resistance. NC 12C and Wilson were highly susceptible to TSWV, according to counts on 28 July.

Tests for taproot infection showed that Wilson, Gregory, and Perry were positive for TSWV in 53 percent, 52 percent, and 43 percent of taproots, whereas Georgia Green, Hull, and GA-03L were positive for TSWV in 33 percent, 31 percent, and 24 percent of taproots, respectively.

Numbers of plants with diagnostic symptoms and signs of CBR on 2 Sept. were low and probably had little or no impact on yield. Pod maturity on 20 Sept. was generally highest in virginia-type varieties.

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Runner-type varieties showing TSWV resistance, potential for maturity in Virginia, high yield, and value included DP-1 (Fig. 1), GA-03L (Fig. 2), Hull (Fig. 3), Georgia Green (Fig. 4), and GA-02C (Fig. 5, Table 2). The value of yield by these varieties ranged from $798 to $912/A, which was greater than any of the commercially-grown varieties of virginia-type peanut (Perry, Gregory, NC-V11, VA 98R, NC 12C, Wilson) with values ranging from $431 to $656/A. Virginia-type varieties not grown commercially in the region but having partial resistance to TSWV, high yield, and values of $777 to $823/A included N02006, AgraTech VC2, and Georgia Hi O/L. Additional studies are needed to define the agronomic and quality traits of new virginia and runner varieties as well as their resistance and susceptibility to other important diseases before changing variety recommendations in Virginia.

Fig. 1. DP-1

Fig. 2. Georgia-03L

Fig. 3. Hull

Fig. 4. Georgia Green

Fig. 5. Georgia-02C

Table 1. Field performance of virginia- and runner-type varieties of peanut in 2004.

Variety and type[z]	Plants/ft[y] (May 24)	TSWV[x] 9 Jul	TSWV[x] 28 July	TSWV[x] 10 Sep	CBR[w] (2 Sep)	% Mature[v] (20 Sep)	Yield[u] (lb/A)	Value[t] ¢/lb	Value[t] $/A
Andru II (R)	1.85 d-g	9.8 f-h	28.3 f-k	10.3 e-k	4.3	27	3997 d-f	17.98	718 d-f
ANorden (R)	1.86 d-g	7.5 h	22.0 i-k	8.0 h-k	2.5	35	3127 g-i	18.74	586 g-i
Carver (R)	1.71 fg	15.8 b-f	36.3 c-h	18.5 b-e	3.5	3	4242 cd	18.52	786 cd
DP-1 (R)	1.73 fg	8.8 gh	16.8 jk	4.8 k	0.8	14	4936 a	18.47	912 a
Georgia Green (R)	2.03 a-d	11.5 d-h	27.3 g-k	9.3 f-k	3.0	18	4371 b-d	19.06	833 a-c
Georgia-01R (R)	1.87 c-f	12.3 d-h	28.8 e-j	13.8 c-k	2.3	1	4213 cd	19.11	805 b-d
Georgia-02C (R)	2.03 a-d	7.8 gh	19.0 jk	4.8 k	1.5	22	4243 cd	18.81	798 cd
Hull (R)	1.86 d-g	13.3 c-h	24.3 h-k	7.5 h-k	0.0	30	4406 a-d	18.45	813 a-d
ViruGard (R)	1.42 h	16.5 b-e	34.8 c-i	19.3 b-e	3.5	34	3458 f-h	18.65	645 f-h
GA-03L (R)	1.97 a-e	8.0 gh	17.5 jk	7.3 i-k	4.0	54	4608 a-c	18.45	850 a-c
AP-3 (R)	1.92 b-f	9.5 gh	15.0 k	5.5 jk	2.0	8	4306 cd	17.98	774 c-e
C99R (R)	1.63 gh	13.3 c-h	24.8 h-k	9.0 g-k	1.8	3	4874 ab	18.54	904 ab
AgraTech VC2 (V)	1.71 fg	16.0 b-e	34.5 d-i	15.5 b-i	3.3	20	4189 cd	18.64	781 c-e
Georgia Hi O/L (V)	1.92 b-f	13.8 b-g	29.8 e-j	12.8 d-k	5.5	23	4346 b-d	18.94	823 a-d
Gregory (V)	1.78 e-g	18.5 bc	41.3 c-f	24.0 b	5.5	52	3432 gh	18.28	627 f-h
NC-V11 (V)	2.17 a	19.8 ab	42.0 c-e	17.3 b-g	3.3	50	2715 i-k	18.69	507 i-k
VT 9506102-6 (V)	1.91 c-f	19.5 ab	47.0 b-d	18.3 b-f	3.3	49	2154 k	18.42	396 l
VA 98R (V)	2.15 ab	19.8 ab	48.0 a-c	17.5 b-g	4.5	54	2474 jk	18.79	465 j-l
Perry (V)	1.88 c-f	12.0 d-h	39.0 c-g	21.0 b-d	5.8	46	3509 e-g	19.31	678 e-g
NC 12C (V)	2.10 a-c	17.5 b-d	56.8 ab	34.3 a	7.0	43	3554 e-g	18.63	662 fg
Wilson (V)	2.01 a-d	25.3 a	60.5 a	24.0 b	4.8	30	2383 jk	18.09	431 kl
N00098 OL (V)	1.62 gh	13.0 c-h	36.0 c-h	16.5 b-h	3.0	32	2938 h-j	18.64	548 h-j
N01013 T (V)	1.85 d-g	8.5 gh	23.8 h-k	14.0 c-j	3.8	61	3376 gh	18.55	626 f-h
N02006 (V)	1.80 d-g	10.8 e-h	38.8 c-g	22.3 bc	3.0	17	4069 c-e	19.09	777 c-e
LSD (P≤0.05)	**0.24**	**6.03**	**13.25**	**9.04**	**n.s**	**--**	**562**	**--**	**105**

[z] R=runner type, V=virginia type.
[y] Determined from counts of plants in two, 35-ft rows/plot.
[x] Counts of plants/plot with symptoms of Tomato spotted wilt virus (TSWV).
[w] Counts of plants/plot with symptoms and signs of Cylindrocladium black rot (CBR).
[v] Percentages of whole pods with mesocarp tissue either black or brown.
[u] Yields are based on weight of peanuts with 7% moisture. Peanuts were dug on 18 Oct; virginia-type varieties were harvested on 22 Oct and runner-types were harvested on 29 Oct.
[t] Value was determined by grading a composite sample of whole pods from replicates of each variety according to procedures used by the Federal-State Inspection Service. Means in columns followed by the same letter(s) are not significantly different (LSD, P≤0.05).

Table 2. Summary of traits for superior performing runner varieties of peanut in 2004.

Variety	TSWV Incidence (Sep 10)	Yield (lb/A)	% Mature (Sep 20)	SS + SMK	Value (¢/lb)
DP-1	4.8	4936	14	75	18.47002
GA-03L	7.3	4608	54	76	18.45443
Hull	7.5	4406	30	76	18.45438
GA Green	9.3	4371	18	79	19.05742
GA-02C	4.8	4243	22	78	18.80863