GPC Project#: UGAT-26-19/25

Long-term germplasm enhancement and development of DNA molecular marker resources for peanut.

Nino Brown – UGA-CRSS – Peanut Breeding

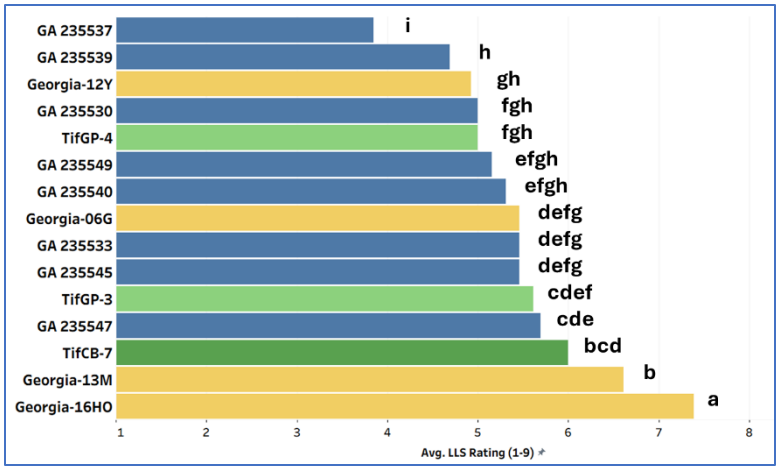

Figure 1. *Late-leaf spot severity score for GA breeding lines (blue), susceptible checks (yellow) and resistant checks (green) in no-fungicide trials conducted at Attapulgus, GA in 2024, and in Edisto, SC, Yoakum, TX, and Tifton, GA in 2025.*

Genotype	Pod Yield			Late-TSWV		
	Rk	lbs/acre		Rk	(%)	
Georgia-20VHO	1	6300	a	10	27.5	cd
GA25007	7	5686	ab	30	5.3	a
GA25032	11	5584	b	27	9.4	ab
GA25030	14	5419	bc	20	15.9	ab
GA25031	16	5372	bc	19	17.5	bc
GA25029	17	5351	bc	23	13.4	ab
GA25034	18	5332	bc	29	5.6	a
GA25033	22	5215	c	28	8.8	ab
GA25037	23	5206	c	26	11.3	ab
GA25036	24	5173	c	25	11.9	ab
GA25035	25	5154	c	24	12.2	ab
Georgia-23RKN	27	5089	c	6	28.4	d
Georgia-06G	30	4813	c	3	32.8	d
Waller LSD		677			10.8	
CV		10.9			52.0	

Genotype	Pod Yield			Late-TSWV		
	Rk	lbs/acre		Rk	(%)	
GA25008	1	6542	a	1	10.3	a
GA25015	2	6476	a	6	17.8	abcd
GA25012	3	6430	ab	9	20.3	bcdefg
GA25014	4	6361	abc	3	15.9	ab
GA25011	5	6293	abc	13	22.5	bcdefg
GA25013	6	6270	abc	2	15.9	ab
GA25001	7	6210	abc	5	16.3	abc
GA25002	8	6207	abc	23	29.1	gh
GA25010	9	6171	abcd	17	25.6	cdefgh
GA25049	10	6163	abcd	7	18.4	abcde
Georgia-20VHO	12	5960	cde	19	26.9	defgh
Georgia-23RKN	14	5641	ef	15	24.4	bcdefgh
Georgia-06G	17	5379	f	25	33.1	h
Waller LSD		461			9.5	
CV		8.5			38.7	

Table 1. *Preliminary yield trial results from PYT-A (left) and PYT-B (right) conducted in 2025 at 4 locations in Georgia (Attapulgus, Midville, Tifton_early, Tifton_late). Pod yield and late-season TSWV incidence is shown for breeding lines derived from NC94022 (blue).*

Growers in Georgia are increasingly faced with a difficult financial outlook for their businesses. Cost of production continues to creep upward while prices for their crops remain flat. In our efforts to develop improved genetics that will keep peanut production profitable in Georgia, our work has focused primarily on improving disease resistance, yield, yield stability, and quality. With this long-term research project, we seek to (1) improve genetic diversity; (2) incorporate germplasm with improved resistance to biotic and abiotic stresses; (3) and map genes that are important to peanut growers for DNA marker-assisted breeding.

We are currently incorporating a number of unique sources of late-leaf spot (LLS) resistance into our breeding pipeline. One of these sources is 'TxAG-6' (Simpson et al., 1993), a tri-species hybrid with high levels of LLS-resistance. Initial crosses with UGA cultivars were made in the greenhouse during the winter of 2018-19. After several years of selecting progenies with acceptable agronomic performance, shelling quality, and LLS-resistance, the first of these lines were tested in 2024 at Attapulgus REC. Based on those results, we narrowed down the list to just 9 lines which were tested in no-fungicide trials in Edisto, SC, Yoakum, TX, and Tifton, GA in 2025. A few of these lines, namely GA 235537, -39, and -30 performed significantly better than the resistant cultivar, TifCB-7 (Fig.1).

For improving resistance to tomato spotted wilt virus (TSWV), we are using NC 94022, a germplasm line developed at NC State, further selected at Univ. of Florida, and tested by Culbreath et al. in 2005. Initial crosses with this line were made in 2020. In 2025, F_6 breeding lines were tested at 4 locations in Georgia (Attapulgus, Midville, Tifton_early, Tifton_late) (Table. 1). Several of these new breeding lines show significantly improved TSWV resistance and pod yields similar to or better than check cultivars.