

APPLICATION FOR RELEASE OF (check one):

CULTIVAR

ASSOCIATE CULTIVAR

GERMPLASM

PARENTAL LINE

GENETIC STOCK

1. Crop:

Peanut (*Arachis hypogaea* L. subsp. *hypogaea* var. *hypogaea*)

2. Experimental no. or name:

17-223

3. Pedigree and history:

The original population was developed by crossing 'Georgia-07W' (Branch and Breneman, 2008) x MAS 7. MAS 7 is a high oleic, nematode-susceptible breeding line selected from the cross of 'Florida-07' (Gorbet and Tillman, 2009) x ['Tifguard' (Holbrook et al., 2008) x Florida-07]. F₁ plants were grown in the summer of 2014. F₂ and F₃ populations were grown during the summer of 2015 and 2016, respectively. Marker-assisted selection was used to identify F₄ seed (eg. 17-223) that were homozygous for high oleic acid content. These seed were planted and individual plants were harvested. Cleaved amplified polymorphic sequence marker 1101/1048 (Chu et al., 2009) targeting the 441_442insA mutation of *AhFAD2* initially was used to genotype for the high O/L trait. For the purpose of this selection, the CAPS marker was converted to a gel-free single nucleotide polymorphism (SNP) assay using a HybProbe design (Roche Applied Science, 2004). Detailed protocols for DNA extraction and marker analysis were presented by Chu et al. (2011).

F_{4:6} progeny rows were grown during the summer of 2018, and visually evaluated for resistance to TSWV and agronomic characteristics before and after digging. Replicated yield testing began with F_{4:7} material.

17-223 was evaluated for resistance to white mold (*Athelia rolfsii*), also known as stem rot, for three years at the Black Shank Farm in Tift County, GA. Plots were inoculated and rated using the system described in Cui et al. (2020).

Approximately 30 Kg of 17-223 seed was purified using a Brimrose Luminar 3076 SeedMeister AOTF-NIR Spectrometer to discard any possible seed that were not high oleic. Remaining seed were planted in Tifton in 2024 for a breeder seed increase.

4. Description of plant material:

17-223 is a high oleic acid peanut. 17-223 is runner market-type in seed and pod size. It

has a spreading runner growth habit with an erect mainstem that is prominent throughout the growing season, and at harvest. It has a high level of resistance to white mold. It is a medium maturity class peanut, with about 135 days needed for optimal maturity. 17-223 has a tan testa (seed coat) with percent kernels comparable to other runner cultivars.

5. Need for and potential users of plant material:

Farmers who want to grow a high oleic, runner-type peanut cultivar with resistance to white mold and TSWV also need the highest yield and grade for maximum economic return.

6. Justification for release:

White mold is one of the most damaging diseases of peanut with regards to both cost of control and yield loss in the southeastern United States (Backman and Brenneman, 1995). 17-223 is a high-oleic (Table 1) peanut genotype with a high level of resistance to white mold (Tables 2, 3, and 4), significantly better than GA-06G over three years of testing (2021-2023). 17-223 also was significantly more resistant to TSWV than GA-06G when tested in 2020-2022) (Tables 5, 6, and 7). 17-223 exhibited very good pod yield in all Tifton, Alabama, and Georgia multilocation variety trials (Tables 2, 3, 4, 5, 6, 11, 12, and 13) and grade was at or near the top of all variety comparisons (Tables 8, 9, 10, 11, and 13). 17-223 is a runner market type with seed size slightly smaller than 'Georgia-06G' and slightly larger than 'Georgia-12Y' (Table 14).

This cultivar is proposed as a joint release from USDA-ARS and UGA.

7. Participating scientists:

Dr. C. Corley Holbrook, USDA-ARS, Tifton, Georgia
Dr. Tim B. Brenneman, Department of Plant Pathology, Tifton, Georgia
Dr. Peggy Ozias-Akins, Department of Horticulture, UGA, Tifton, Georgia
Dr. Ye Chu, Department of Horticulture, UGA, Tifton, Georgia
Dr. Albert K. Culbreath, Department of Plant Pathology, Tifton, Georgia

8. Location(s) at which plant material was developed:

Coastal Plain Experiment Station, Tifton, Georgia

9. Recommended form of intellectual property protection and royalty:

Plant variety protection with royalty assessment.

Cultivar and associate cultivar applications only provide the following information:

10. Method of propagation:

Seed from self pollination.

11. Amount of breeder seed stocks available (if applicable):

50 pounds

12. Amount of foundation seed stocks available if applicable:

We have provided Georgia Seed Development with 300 pounds of seed to use for a foundation seed increase in the 2025 season.

13. Amount of cutting or bud material available for vegetatively propagated material for nursery distribution (if applicable):
Not applicable.
14. Describe any unusual difficulty anticipated in the production of any class of seed stocks:
None.
15. Suggest up to three names for the cultivar, if appropriate:
~~USDA-ARS-TifTB~~
~~USDA-ARS-TifWM~~
~~USDA-ARS-TifSB~~
16. Name approved by plant cultivar and germplasm release committee:

- Backman, P.A., and T.B. Brenneman. 1995. Stem rot. *In*: N. Kokalis-Burelle, D.M. Porter, R. Rodriguez-Kabana, D.H. Smith, and P. Subrahmanyam (Eds.) Compendium of peanut disease. (pp.36-37). APS Press.
- Branch, W.D., and T.B. Brenneman. 2008. Registration of 'Georgia-07W' peanut. *Journal of Plant Registrations* 2:88-91.
- Chu, Y., C.C. Holbrook, and P. Ozias-Akins. 2009. Two allele of *ahFAD2B* control the high oleic acid trait in cultivated peanut. *Crop Sci.* 49:2029-2036.
- Chu, Y., C.L. Wu, C.C. Holbrook, B.L. Tillman, G. Person, and P. Ozias-Akins. 2011. Marker-assisted selection to pyramid nematode resistance and the high oleic trait in peanut. *The Plant Genome* 4:110-117.
- Cui, R., J. Clevenger, Y. Chu, T. Brenneman, T.G. Isleib, C.C. Holbrook and P. Ozias-Akins. 2020. Quantitative trait loci sequencing-derived molecular markers for selection of stem rot resistance in peanut. *Crop Sci.* 60:2008-2018.
- Gorbet, D.W., and B.L. Tillman. 2009. Registration of 'Florida-07' peanut. *Journal of Plant Registrations* 3:14-18.
- Holbrook, C.C., P. Timper, A.K. Culbreath, and C.K. Kvien. 2008. Registration of 'Tifguard' peanut. *Journal of Plant Registrations* 2:92-94.

NOTE: Released as Tif-TB

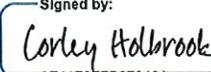
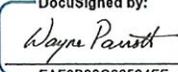
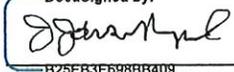
APPLICATION FOR RELEASE

Application for the release of 17-223 Peanut (Arachis hypogaea L. subsp. hypogaea var. hypogaea) cultivar

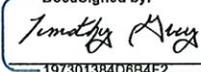
After the application has been reviewed and approved by the Committee and requested changes have been made, please send the entire application through DocuSign, including this signature page. There are directions for establishing your own DocuSign account; the College OIT help desk will be able to help you if you run into issues establishing your account, or if you have other questions.

At the Add Recipients step, please be sure to click on the signing order check box, so that it goes for signature in the correct order. Use Needs to Sign for everyone below:

Release recommended by:

- A.  Signed by: Corley Holbrook 03/27/2025 | 7:29 AM EDT
DE41F5E7B878401...
 Originating Scientist Corley Holbrook
 DocuSigned by: _____
 Date
- B.  Signed by: Wayne Parrott 03/27/2025 | 7:53 AM EDT
FAE3B88C66534FE
 Chair, GAES-PCGRC
 This will be Wayne Parrott, wparrott@uga.edu
 Date
- C.  DocuSigned by: Jodi Johnson-Maynard 03/27/2025 | 11:10 AM EDT
B25EB3E998BB409
 Department Head
 This will be either
 - Jodi Johnson-Maynard, jlmaynard@uga.edu, or
 - Leo Lombardini, lombardini@uga.edu, or
 - Harald Scherm, scherm@uga.edu
 Date

Signature by the DH and Assistant Deans indicates that 1) the DH has reviewed the application with the executive committee and/or appropriate commodity committees as needed, and 2) the application has been reviewed to ensure that the genetic material was developed with GAES funds and that the application includes appropriate collaborators involved in developing the genetic material.

- D.  DocuSigned by: Timothy Grey 03/27/2025 | 5:12 PM EDT
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 For Griffin and Tifton, Assistant Dean
 This will be either
 - Timothy Grey, tgrey@uga.edu, for Tifton, or
 - Jeff Dean, jeffdean@uga.edu, for Griffin
 Date
- E.  Signed by: Harshvardhan Thippareddi 04/07/2025 | 8:25 AM EDT
DDA6A4D5BA1451...
 Associate Dean for Research
 - This will be Dr. Harsha Thippareddi, agresch@uga.edu
 - And the last step will also be Dr. Harsha Thippareddi, agresch@uga.edu
 Date

Approved:  Signed by: Harshvardhan Thippareddi 04/07/2025 | 8:25 AM EDT
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 Dean and Director
 Date

Table 1. Oleic/Linoleic ratio of 17-223 and two current peanut cultivars in 2021.

<u>Entry</u>	<u>O/L Ratio</u>
17-223	25.6
TifNV-High O/L	27.1
Florun 52N	2.0

Data from JLA Seed Evaluation Index 2022 (2021 Crop).

Table 2. 2021 white mold field evaluation (T. Brenneman-Blackshank Farm)

<u>Entry</u>	<u>White Mold</u>			<u>Yield</u>
	<u>% Zeros¹</u>	<u>No Zeros²</u>	<u>All²</u>	<u>kg/ha</u>
17-223	75.0	19.4	4.4	8462
TifCB-7	0.0	62.1	62.1	6036
TifNV-Hi OL	33.3	18.9	13.1	7392
GA-06G	4.2	56.6	54.2	6752
GA-09B	4.2	56.1	51.3	6917
GA-12Y	20.8	20.0	16.0	9711
LSD (0.05)	16.7	20.8	19.9	1286

¹ Percent of inoculated plants that had no disease.

² Average length of the white mold “hits” (cm) calculated with and without “0’s”.

Table 3. 2022 white mold field evaluation (T. Brenneman-Blackshank Farm)

<u>Entry</u>	<u>White Mold</u>			<u>Yield</u>
	<u>% Zeros¹</u>	<u>No Zeros²</u>	<u>All²</u>	<u>kg/ha</u>
17-223	45.8	15.8	6.2	6520
TifNV-HG	33.3	17.4	11.8	7565
TifNV-Hi OL	33.3	15.5	9.7	7909
GA-06G	20.8	39.0	31.7	7161
GA-09B	0.0	47.9	48.9	5724
GA-12Y	37.5	18.3	11.5	7460
LSD (0.05)	22.2	13.4	11.2	1315

¹ Percent of inoculated plants that had no disease.

² Average length of the white mold “hits” (cm) calculated with and without “0’s”.

Table 4. 2023 white mold field evaluation (T. Brenneman-Blackshank Farm)

Entry	White Mold			Yield kg/ha
	% Zeros ¹	No Zeros ²	All ²	
17-223	41.7	23.4	14.4	8130
TifCB-7	0.0	60.0	60.0	5501
TifNV-HG	8.3	53.6	50.7	6340
TifNV-Hi OL	16.7	28.0	23.1	6798
GA-06G	0.0	42.5	42.5	5496
GA-09B	0.0	56.3	56.3	4986
GA-12Y	20.8	33.0	27.8	6776
LSD (0.05)	12.5	20.9	19.4	1468

¹ Percent of inoculated plants that had no disease.

² Average length of the white mold “hits” (cm) calculated with and without “0's”.

Table 5. Pod yield and final intensity of tomato spotted wilt (TSW) of selected peanut genotypes at Tifton, GA in 2020 (Test 40 TSWV – Holbrook – Gibbs Farm)

Entry	Yield kg/ha	Entry	TSW
GA-16HO	4731	GA-06G	7.7
TifNV-High O/L	4460	TifNV-HG	6.0
17-223	4417	17-223	3.8
GA-06G	4161	GA-16HO	3.3
TifNV-HG	4015	TifNV-High O/L	1.3
LSD (0.05)	686		3.4

Table 6. Pod yield and final intensity of tomato spotted wilt (TSW) of selected peanut genotypes at Tifton, GA in 2021 (Culbreath TSWV Trial-Lang Farm)

Emtry	Yield kg/ha	% TSW
17-223	8258	10.0
GA-12Y	7705	13.1
TifCB-7	6839	26.9
TifNV-Hi O/L	6326	21.9
GA-06G	5915	31.3
LSD (0.05)	1264	

Table 7. Intensity of tomato spotted wilt (TSW) of selected peanut genotypes at Tifton, GA in 2022. (Culbreath TSWV Trial-Lang Farm)

Entry	% TSW	
	7/4	7/26
GA-06G	48.8	54.4
GA-12Y	11.9	29.4
17-223	26.3	18.9
TifCB-7	23.8	25.6
TifNV-HG	32.5	40.0
TUFRunner 511	58.8	70.6
LSD (0.05)	18.7	14.5

Table 8. Grade (% sound mature kernels (TSMK) and % kernels) of selected peanut genotypes in Test 40 TSWV in Tifton, GA in 2020. (Holbrook – Gibbs Farm)

Entry	% TSMK	Entry	% Kernels
17-223	70.5	17-223	72.0
GA-16HO	69.3	GA-06G	71.0
GA-06G	69.0	GA-16HO	70.5
TifNV-HG	68.3	TifNV-HG	69.8
LSD (0.05)	2.6		1.2

Table 9. Grade (% sound mature kernels (TSMK) and % kernels) of selected peanut genotypes in Test 40 TSWV in Tifton, GA in 2021. (Holbrook – Gibbs Farm)

Entry	% TSMK Kernels	
GA-20VHO	78.0	81.5
17-223	77.8	80.0
TifCB-7	77.3	81.0
GA-06G	76.0	78.8
GA-18RU	75.5	80.3
GA-16HO	75.3	78.5
TifNV-HG	75.3	78.0
TUFRunner 511	73.8	77.0
LSD (0.05)	2.0	1.3

Table 10. Grade (% sound mature kernels (TSMK) and % kernels) of selected peanut genotypes in Test 40 MAX in Tifton, GA in 2022. (Holbrook – Gibbs Farm)

Entry	%	
	TSMK	Kernels
GA-20VHO	76.3	82.0
GA-18RU	75.8	79.8
GA-16HO	75.3	79.5
17-223	75.3	79.0
TifCB-7	74.8	79.8
GA-06G	74.8	80.0
TifNV-HG	73.8	77.5
TifNV-High O/L	72.5	77.0
LSD (0.05)	2.3	0.8

Table 11. Pod yield and grade (% TSMK) of selected genotypes in the 2023 Alabama Peanut Variety Trials

Variety	Headland			
	Irrigated		Non-Irrigated	
	Yield kg/ha	TSMK %	Variety	Yield kg/ha
Georgia-12Y	6149	67.0	FloRun T61	5392
FloRun T61	6071	67.0	Georgia-12Y	5385
Georgia-21GR	6050	72.8	AU-NPL 17	5322
AU-NPL 17	6035	64.8	17-223	5178
17-223	5483	72.8	TifNV-HG	5073
TifCB-7	5465	72.3	Georgia-06G	4546
Georgia-06G	5305	70.8	CB 20	4546
TifNV-HG	4808	71.5	TifCB-7	4388
TifNV-Hi O/L	4595	68.8	TifNV-Hi O/L	4248
LSD (0.10)	842	3.0		804

Bolded numbers are not statistically different from the highest yielding (or grading) entry.

Table 12. Pod yield of selected genotypes in the 2024 Georgia Peanut Variety Trials

Multi-Location (Tifton and Midville) Performance Results

Variety	Irrigated	Dryland	Statewide
	Average	Average	Average
	kg/ha	kg/ha	kg/ha
GA-06G	8329	5594	6962
TifNV-HG	8212	5447	6829
17-223	7835	5706	6770
TifCB-7	8028	5178	6603
TifNV-High O/L	7706	5387	6547
GA-12Y	7025	5468	6247
Mean	7603	5442	6522
LSD (0.1)	288	327	217

Bolded numbers are not statistically different from the highest yielding entry.

Table 13. Pod yield and grade (% TSMK) of selected genotypes in the 2024 Alabama Peanut Variety Trials

Variety	Irrigated		Headland		Non-Irrigated	
	Yield	TSMK	Variety	Yield	TSMK	
	kg/ha	%		kg/ha	%	
TifNV-HG	6474	70.8	17-223	4745	74.8	
17-223	6370	74.3	GA-12Y	4278	71.8	
GA-12Y	6283	65.5	TifNV-HG	4261	71.5	
GA-06G	6039	73.3	GA-06G	4072	72.8	
TifNV-High O/L	5796	71.0	TifCB-7	3813	72.3	
TifCB-7	5308	71.8	TifNV-High O/L	3762	71.5	
Average	6063	70.9		3934	71.0	
LSD (0.1)	750	2.1		582	1.8	

Bolded numbers are not statistically different from the highest yielding (or grading) entry.

Table 14. Seed size (seed per kg) of selected genotypes in the 2023 Alabama Variety Trials

<u>Entry</u>	<u>Seed per Pound</u>
TifCB-7	2,181
GA-12Y	1,667
17-223	1,529
GA-06G	1,341
TifNV-Hi O/L	1,341
TifNV-HG	1,205
<u>LSD (0.10)</u>	<u>86</u>