



(12) **United States Plant Patent**
Hanna et al.

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(54) **GRASS NAMED ‘TIFT PA19’**

(50) Latin Name: *Pennisetum alopecuroides*
Varietal Denomination: **Tift PA19**

(71) Applicant: **University of Georgia Research Foundation, Inc.**, Athens, GA (US)

(72) Inventors: **Wayne W. Hanna**, Chula, GA (US);
Brian M. Schwartz, Tifton, GA (US)

(73) Assignee: **University of Georgia Research Foundation, Inc.**, Athens, GA (US)

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(56) **References Cited**

PUBLICATIONS

<http://magazine.gardencentermag.com/article/january-2018/emerald-coast-growers-january-2018.aspx>; Jan. 2018; 4 pages.*

* cited by examiner

Primary Examiner — Kent L Bell

(74) *Attorney, Agent, or Firm* — Klarquist Sparkman, LLP

(57) **ABSTRACT**

A new variety of *Pennisetum alopecuroides* plant named ‘Tift PA19’ produces a reduced number of seeds, making it less invasive.

2 Drawing Sheets

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Latin name of the genus and species of the plant claimed: ‘Tift PA19’ is a vegetatively propagated ornamental perennial *Pennisetum* cultivar of the genus and species *Pennisetum alopecuroides*.

Variety denomination: The new *Pennisetum alopecuroides* claimed is of the cultivar denominated ‘Tift PA19’.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct cultivar of *Pennisetum alopecuroides* herein referred to as ‘Tift PA19’.

The new *Pennisetum alopecuroides* is a product of a planned research, evaluation, and testing program conducted by the Inventors in Tifton, Ga. The objective of the *Pennisetum alopecuroides* research program is to create a new plant cultivar with reduced seed production. This cultivar is commercially important for its superior ornamental value and low seed production. These and other qualities are enumerated herein.

Pedigree and history: We evaluated four unpatented morphologically variable accessions maintained at Tifton, Ga. for ornamental potential: ‘Tift PS989’, ‘Tift PS990’, ‘Tift PS1122’, and ‘Tift PS1123’. ‘Tift PS989’ and ‘Tift PS1122’ were selected as accessions with the most ornamental potential. *Pennisetum alopecuroides* accessions and cultivars are known to produce abundant seed. Seed production in commercial ornamental cultivars of *Pennisetum alopecuroides* tends to make this genus/species invasive, an undesirable trait in landscapes. Seeds from open pollinated ‘Tift PS1122’ plants were irradiated on 11 Nov. 2010 with 20 Kr of Cobalt 60 gamma radiation. These irradiated seeds were planted to

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produce a first group of plants. In 2011, this first group of plants were evaluated and eight of these first group of plants were selected. These eight plants were selected as morphologically desirable ornamental genotypes with reduced seed set. Open pollinated seeds were harvested from these eight plants. These seeds from the eight selected plants were re-irradiated on 10 Jan. 2012 with 10 Kr of Cobalt 60 radiation. Only three of the eight plants produced seed that survived this second irradiation. The surviving seed from the three plants were planted to produce 142 plants, numbered consecutively from 1 to 142, that were grown in adjacent rows in a field. These 142 plants were allowed to open pollinate. Irradiation of seeds usually results in chineras or sectors on the plants for the trait of interest. Therefore, each of the 142 plants was divided into four quadrants or sectors (a, b, c, and d) and five or more inflorescences from each quadrant were examined for seed sterility. Three sectors of plant 140, which were the same sterile mutant and a large sterile sector of plant 140, was selected and became ‘Tift PA19’. ‘Tift PA19’ has been tested at Tifton, Ga. and Blairsville, Ga. from 2012 thru 2015. Tests consisted of five and four single plant replications arranged in a randomized complete block experiment at Tifton, Ga. and Blairsville, Ga., respectively. Other experimental entries were included in each test. ‘Tift PA24’ (unpatented) was selected as a seed fertile check with desirable ornamental characteristics from Tift PS1122. ‘Tift PA24’ also produced abundant pollen for pollinating the experimental seed sterile cultivars in the replicated tests to make sure that the experimental sterile cultivars would not set seed when pollinated with pollen from another genotype.

Asexual reproduction of the new *Pennisetum* 'Tift PA19' by vegetative propagation (single stem propagules) in a controlled environment in Tifton, Ga. and Blairsville, Ga. from 2012 through 2015, has shown that the unique features of this new *Pennisetum* cultivar are stable and reproduced true to type in successive generations.

SUMMARY OF THE INVENTION

The following traits have been repeatedly observed and represent the characteristics of a new *P. alopecuroides* cultivar 'Tift PA19'. The new cultivar 'Tift PA19' has not been observed under all possible environmental conditions. The phenotype may vary somewhat with variations in, for example, temperature, day-length, light intensity, soil types, and water and fertility levels without, however, any variance in genotype.

Throughout this specification, color names beginning with a small letter signify that the name of that color, as used in common speech, is aptly descriptive. Color names beginning with a capital letter designate values based upon The R.H.S. Colour Chart (5th Edition, 2007), published by The Royal Horticultural Society, London, England.

The following traits have been repeatedly observed for the new *P. alopecuroides* cultivar 'Tift PA19' in Tifton, Ga. and Blairsville, Ga. and can be compared to *P. alopecuroides*, 'Tift PA24' (a seed fertile genotype with desirable ornamental characteristics):

1. 'Tift PA19' exhibits a vigorous growth habit.
2. 'Tift PA19' is highly seed sterile.

The new cultivar *Pennisetum* 'Tift PA19' can be compared to *Pennisetum alopecuroides*, 'Tift PA24', a seed fertile and desirable ornamental selection:

Plants of the new *Pennisetum* 'Tift PA19' are compared to 'Tift PA24' in the following characteristics:

1. The new cultivar 'Tift PA19' produces significantly fewer seeds at Tifton, Ga. and Blairsville, Ga. compared to 'Tift PA24'.
2. The new cultivar 'Tift PA19' produces inflorescences that are shorter in height than inflorescences of 'Tift PA24'. The leaf heights of 'Tift PA19', with the exception of one year in Tifton, Ga. were shorter than the leaf heights of 'Tift PA24'.
3. The new cultivar 'Tift PA19' produces a leaf canopy diameter that is about equal to significantly larger than that of 'Tift PA24'.
4. Inflorescence lengths of the new cultivar 'Tift PA19' range from shorter than to approximately equal to the inflorescence lengths of 'Tift PA24'.
5. Leaf width of the new cultivar 'Tift PA19' tends to be narrower than the leaf width of 'Tift PA24'.
6. The new cultivar 'Tift PA19' produces significantly more inflorescences than 'Tift PA24'.

The following observations, measurements, and values describe plants grown in Tifton, Ga and Blairsville, Ga. In Tables 1-7, the least significant difference (LSD) is set at $P \leq 0.05$ probability level. Growth days were included in ratings. Plants were spaced 1 meter apart down the row and rows were 2 meters apart. Plants were established as single stem propagules in mid-April to mid-May and rated in September through October. Data was taken from plants during year of establishment at Tifton and Blairsville except 2015 data from Blairsville was taken on plants established in 2014. 'Tift PA19' inflorescence height was typically shorter than 'Tift PA24' inflorescence height. Leaf height of 'Tift

PA19' was greater than the leaf height of 'Tift PA24' at the higher elevation of Blairsville, but shorter at Tifton. Canopy diameter of 'Tift PA19' plants ranged from about equal to greater than the canopy diameter of 'Tift PA24' plants. However, 'Tift PA19' had significantly wider canopy diameter than 'Tift PA24' in 2015 at Blairsville. This is indicative of the vigor of these four selections at the higher elevation. The canopy diameter contributes to the beauty of the long arching leaves of these selections before inflorescences are produced. Inflorescence number adds greatly to the beauty of this species. Inflorescence numbers for 'Tift PA19' greater than for 'Tift PA24' (Table 4) in all years. However, inflorescence length for 'Tift PA19' tended to be slightly shorter than inflorescence length of 'Tift PA24' (Table 5). Leaf lengths of 'Tift PA19' were greater at Blairsville and shorter at Tifton than leaf lengths of 'Tift PA24'. The widths of 'Tift PA19' leaves were slightly less than the widths of 'Tift PA24' leaves (Table 6).

The adaxial leaf surface of mature leaves of 'Tift PA19' plants were Green 143A, whereas inflorescence colors were Greyed Orange-165D for 'Tift PA19'.

Seed set of 'Tift PA19' is significantly reduced despite the increased numbers of inflorescences. (Table 7).

TABLE 1

Height of inflorescence of two <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.							
Entry	Height of Inflorescence (cm)						
	Tifton			Blairsville			
	2012	2014	2015	2012	2013	2014	2015
'Tift PA19'	56	45	69	84	102	91	103
'Tift PA24'	62	51	83	107	126	106	106
LSD	6	9	8	9	12	14	9
Growth Days	180	99	101	178	116	130	155

Plant heights were measured from ground level to top of inflorescence. The Tifton tests were planted 18 Apr. 2012, 2 Jun. 2014, and 12 May 2015 and measurements were taken 15 Oct. 2012, 9 Sep. 2014, and 21 Aug. 2015, respectively. The Blairsville tests were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements were taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference at the $P \leq 0.05$ probability level.

TABLE 2

Height of leaves of two ornamental <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed fertile control) planted at two locations in Georgia.								
Entry	Height of Leaves (cm)							
	Tifton				Blairsville			
	2012	2013	2014	2015	2012	2013	2014	2015
'Tift PA19'	74	48	28	43	52	74	43	67
'Tift PA24'	86	41	34	54	60	73	50	83
LSD	9	8	7	5	5	9	10	5
Growth Days	180	170	99	101	148	116	130	155

The height of leaves were measured from ground level to top of leaf canopy.

The tests at Tifton were planted 18 Apr. 2012, 13 Apr. 2013, 2 Jun. 2014, and 12 May 2015 and measurements taken 5 Oct. 2012, 30 Sep. 2013, 9 Sep. 2014, and 21 Aug. 2015, respectively. The Blairsville tests were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements were taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference at the $P \leq 0.05$ probability level.

TABLE 3

Canopy diameter of two ornamental <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed fertile control) planted at two locations in Georgia.				
Entry	Canopy Diameter (cm)			
	Tifton		Blairsville	
	2012	2015	2014	2015
'Tift PA19'	94	99	129	148
'Tift PA24'	81	98	123	136
LSD-5%	10	9	25	7
Growth Days	180	101	130	155

The canopy diameter is the average diameter of the widest and the narrowest diameter of a single plant canopy. The tests at Tifton were planted 18 Apr. 2012 and 12 May 2015 and measurements taken 8 Oct. 2012, and 21 Aug. 2015, respectively. The tests at Blairsville were planted 15 May 2014 and measurements taken 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants). The least significant difference was set at the $P \leq 0.05$ probability level.

TABLE 4

Number of inflorescences per plant of two ornamental <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed fertile control) planted at two locations in Georgia.					
Entry	Number of Inflorescences				
	Tifton			Blairsville	
	2012	2014	2015	2014	2015
'Tift PA19'	150	230	149	109	98
'Tift PA24'	79	135	62	75	67
LSD-5%	33	42	16	43	19
Growth Days	180	99	101	130	155

Total number of inflorescences were counted per plant. The tests at Tifton were planted 18 Apr. 2012, 13 Apr. 2013, 2 Jun. 2014, and 12 May 2015 and measurements were taken on 15 Oct. 2012, 30 Sep. 2013, 9 Sep. 2014, and 21 Aug. 2015, respectively. The tests at Blairsville were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements were taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference was set at the $P \leq 0.05$ probability level.

TABLE 5

Inflorescence length of two ornamental <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed fertile control) planted at two locations in Georgia.						
Entry	Inflorescence Length (cm)					
	Tifton		Blairsville			
	2012	2015	2012	2013	2014	2015
'Tift PA19'	11	10.7	11	12	11	14
'Tift PA24'	13	11.1	13	15	13	15
LSD-5%	1	0.8	1	1	2	1.4
Growth Days	180	101	178	116	130	155

Inflorescence length was the mean of three inflorescences per plant. The tests at Tifton were planted 18 Apr. 2012 and 12 May 2015 and measurements taken 15 Oct. 2012 and 21 Aug. 2015, respectively. The tests at Blairsville were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference at the $P \leq 0.05$ probability level.

TABLE 6

Leaf characteristics of individual plants of two ornamental <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed fertile control) planted at two locations in Georgia.						
Entry	Leaf Length (cm)			Leaf Width (mm)		
	Tifton		Blairsville	Tifton		Blairsville
	2012	2015	2015	2012	2015	2015
'Tift PA19'	25.1	26.6	48.8	4.8	5.2	9
'Tift PA24'	26.8	33.6	40.2	6.5	7.4	9.6
LSD	5.1	3.3	10.9	1.4	0.7	1.1

Leaf length (average from three culms) was measured from the leaf collar to the leaf tip of the latest fully extended leaf. Leaf width (average of three culms) was measured in the center of the latest fully extended leaf. The tests at Tifton were planted 18 Apr. 2012 and 12 May 2015 and measurements taken 15 Oct. 2012, and 21 Aug. 2015, respectively. The tests at Blairsville were planted 15 May 2014 and measurements taken 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference was set at the $P \leq 0.05$ probability level.

TABLE 7

Seed set per inflorescence and seed germination of two ornamental <i>Pennisetum alopecuroides</i> grasses ('Tift PA24' is the seed fertile control) planted at two locations in Georgia.					
Entry	Seeds per Inflorescence				Seed Germination—%
	Tifton		Blairsville		Blairsville
	2013	2015	2013	2015	2014
'Tift PA19'	0.3	2.4	0.0	1.2	16
'Tift PA24'	15.4	91.5	121	71.2	93
LSD	0.3	0.0	26	1.3	21

Seeds per inflorescence was the mean of four random inflorescences per each replication. Seed germination tests consisted of 25 seeds from four and three different plants (replications) harvested in October 2014 at Tifton and Blairsville, respectively. Germination tests were conducted in April of 2015 to allow seeds to go through a dormancy period and simulate field conditions. The Tifton tests were planted 13 Apr. 2013 and 12 May 2015 and measurements taken in October 2013 and 2015. The Blairsville tests were planted 16 May 2013, and 15 May 2014, and measurements taken 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant differences were set at the $P \leq 0.05$ probability level.

TABLE 8

Summary of morphological characteristics of two <i>Pennisetum alopecuroides</i> cultivars.		
Trait	'Tift PA24'	'Tift PA19'
Mature inflorescence height	51-126 cm	45-103 cm
Mature leaf height	34-86 cm	28-74 cm
Diameter of plant canopy	81-135 cm	94-148 cm
Inflorescence length	11.1-15 cm	10.7-14 cm
Number of Inflorescences per plant	62-135	98-230
Leaf width	7.4-9.6 mm	4.8-9 mm
Leaf length	26.8-40.2 cm	25.1-48.8 cm
Adaxial leaf surface trichomes	Glabrous	Glabrous
Abaxial leaf surface trichomes	Glabrous	Glabrous
Leaf blade margin trichome length	Less than 0.5 mm long	Less than 0.5 mm long
Leaf collar trichomes	Dense, 2 mm long	Medium density, 1 mm long
Sheath trichomes	Margins sparse, 1 mm long	Margins sparse, less than 1 mm long
Ligule	Yes.	Yes
Ligule trichomes	Sparse, less than 1 mm long	0.5 mm
Sheath trichomes	Sparse, 1 mm long	Sparse on margins, less than 1 mm long
Floret length	5-6 mm	5 mm
Bristle length surrounding florets	6-19 mm	6-25 mm

BRIEF DESCRIPTION OF THE FIGURES

The accompanying colored photographs illustrate the overall appearance and distinct characteristics of the new cultivar of *Pennisetum* 'Tift PA19'. The colors in the photographs are as close as possible with the photographic and printing technology utilized.

Certain characteristics of this variety, such as growth and color, may change with changing environmental conditions (e.g., light, temperature, moisture, nutrient availability, or other factors). Color descriptions and other terminology are used in accordance with their ordinary dictionary descrip-

tions, unless the context clearly indicates otherwise. Color designations are made with reference to The Royal Horticultural Society (R.H.S.) Colour Chart (5th edition, 2007).

FIG. 1 is a photograph of a 'Tift PA19' plant at anthesis in a research plot (year of establishment) in Tifton, Ga.

FIG. 2 is a photograph of 'Tift PA19' plants in a research plot (two year old plants) in Union County, Ga.

DETAILED DESCRIPTION

The new cultivar 'Tift PA19' is a vigorous perennial at Blairsville, Ga. (USDA Zone 7a). The new cultivar 'Tift PA19' survived 90, 95, and 101 days below 0° C. and low temperatures of -9, -29, and -17° C. for the winters of 2012/2013, 2013/2014, and 2014/2015, respectively at Blairsville, Ga.

All data are from plants established as single stem propagules in mid-April to mid-May and rated in September through October, except 2015 data from Blairsville, Ga. was collected from plants planted in 2014.

Plant:

Mature inflorescence height.—57-110 cm.

Mature leaf height.—41-81 cm.

Diameter of plant canopy.—76-153 cm.

Inflorescence length.—11.1-19 cm.

Number of inflorescences per plant.—65-195.

Number of culms per plant.—Typically about the same as the number of inflorescences per plant (Table 4) because most of the major culms produce an inflorescence.

Leaf:

Leaf width.—5.7-8.8 mm.

Leaf length.—27.6-47 cm.

Adaxial leaf surface trichomes.—Glabrous.

Abaxial leaf surface trichomes.—Glabrous.

Leaf blade margin trichome length.—Less than 1 mm long.

Leaf collar trichomes.—Medium density, 2 mm long.

Sheath trichomes.—Margin sparse, less than 1 mm long.

Ligule.—Yes.

Ligule trichomes.—Glabrous.

Sheath trichomes.—Sparse on margins, less than 1 mm long.

Adaxial leaf color.—Green 141B.

Abaxial leaf color.—Green 139D.

Inflorescence color.—Greyed Orange 165B.

Although rust (*Puccinia substriata*), leaf spot (*Pyricularia grisea*), and *Helminthosporium* sp. leaf spot are common diseases for *Pennisetum* in Tifton, Ga. due to its humid and warm climate; to date, 'Tift PA19' has not presented any disease symptoms.

No pest susceptibility has been observed for 'Tift PA19'.

Hardiness: 'Tift PA19' has vigorously survived 64, 97 and 96 days below 0° C. and lowest temperatures of -12° C., -18° C. and -17° C., in 2012, 2014, and 2015, respectively in Blairsville, Ga.

The invention claimed is:

1. A new and distinct cultivar of *Pennisetum alopecuroides* plant named 'Tift PA19', as illustrated and described herein.

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FIG. 1



FIG. 2