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RELEASE OF TAMCOT 22, TAM 96D-18, TAM 96D-69S, TAM 98D-102 AND TAM 98D-99NE

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Abstract

'Tamcot 22', TAM 96WD-69s, TAM 96WD-18 , TAM 98D-102 and TAM 98D-99ne upland cottons (*Gossypium hirsutum* L.) were developed by the Cotton Improvement Laboratory, Department of Soil and Crop Sciences, Texas Agricultural Experiment Station as part of an ongoing effort to create germplasm and/or cultivars with improved yield and quality potential for central and south Texas. Tamcot 22, TAM 96WD-69s, TAM 96WD-18, TAM 98D-102 and TAM 98D-99ne have picker-type bolls, mid-season maturity, and good yield potential combined with varying fiber quality packages. With the exception of TAM96WD-69s which has glabrous leaves and stems, all have pubescent leaves and stems. Tamcot 22 has varying levels of leaf pubescence, ranging from 7 to 72 trichomes cm^{-2} on the leaves. TAM 96WD-69s is a near glabrous leaf and stem line that has resistance to fleahopper [*Pseudatomoscelis seriatus* (Reuter)] (Mekala, 2004), and silverleaf whitefly [*Bemesis argentifolli* (Gennadius)] by virtue of its smooth leaves. Fully expanded leaves of TAM 96WD-69s averaged 9 trichomes cm^{-2} while leaves of 'Deltapine 50' (Calhoun et al., 1994), Tamcot 22, and 'Tamcot CAB-CS' (Bird et al., 1986) averaged 12, 33, and 4 trichomes cm^{-2}, respectively. The stems of TAM 96WD-69s averaged 1 trichome cm^{-2} compared with 6 trichome cm^{-2} on Deltapine 50, 8 trichomes cm^{-2} on Tamcot 22, and 0.4 trichome cm^{-2} on Tamcot CAB-CS. The number of trichomes on bract margins of TAM 96WD-69s was 76 cm^{-2} while Deltapine 50, Tamcot 22 and Tamcot CAB-CS averaged 86, 242, 72, respectively. TAM 98D-99ne does not exhibit leaf nor bract nectaries. Tamcot 22, TAM 96WD-69s, TAM 96WD-18, TAM 98D-102 and TAM 98D-99ne are adapted to production regions of Texas from the Rio Grande Valley to the Rolling Plains and westward to the Winter Garden area. They perform well on the High Plains but do not possess sufficient storm resistance for production in that region.

Tamcot 22 resulted from the cross of TAM 87 G^3-27 (Smith and Niles, 1994), a germplasm line exhibiting excellent fiber length, and TAM 88 G-104 (Smith, 2001). TAM 88G-104 is a high yielding picker-type upland cotton with resistance to silverleaf whitefly, *Bemesia argentifolii*. TAM 88G-104 was developed from the cross of 'Deltapine 90' (Calhoun et al., 1994) and CS-8606 (Smith and Niles, 1988), and marketed by South Texas Planting Seed Company of Weslaco, Texas as 'Texas 418'. TAM 96WD-18 is a full sib of Tamcot 22. TAM 96WD-69s was derived from the cross of TAM 88G-104 with 87AAA-1, an unreleased glabrous breeding line. TAM 98D-102 and TAM 98D-99ne are sister lines with improved fiber strength and the nectariless trait, respectively, resulting from the cross of an unreleased nectaried breeding line and 'MD-51ne' (Meredith, 1993). The nectariless trait reduces damage by fleahopper [*Pseudatomoscelis seriatus* (Reuter)], plant bug (*Lygus* spp), bollworm [*Helicoverpa zea* (Boddie)], tobacco budworm [*Heliothis virescens* (F.)], pink bollworm [*Pectinophera gossypiella* (Saunders)], and other insect pests (Meredith, 1976). Tamcot 22, TAM 96WD-69s, TAM 96WD-18, TAM 98D-102 and TAM 98D-99ne were derived from a single $F_{2:3}$ plants selected on the basis of their apparent yield potential, fiber properties, and overall plant characteristics. The resulting $F_{3:4}$ progeny rows were treated subsequently as a pure lines and evaluated throughout Central, South and North Texas.

Tamcot 22, TAM WD-69s, and TAM WD-18 were tested extensively throughout Texas and in the mid-South region of the U.S. for drought tolerance, agronomic characteristics, earliness, yield potential, and fiber quality characteristics. Field evaluations were conducted over 5 years (1998–2002) at eight locations in Texas (Weslaco, Corpus Christi, San Patricio County, Uvalde, College Station, Thrall, Dallas and Chillicothe) for yield, lint fraction, and fiber quality.

Averaged over five locations, Tamcot 22 produced 16% more lint yield than 'Sure-Grow 125', and 20% more lint than 'Tamcot Sphinx' (El-Zik and Thaxton, 1996) (Table 1). Over 14 cultivar trials in Texas during 2001 and 2002, Tamcot 22 produced fibers that were longer than Tamcot Sphinx, but were 6% shorter than 'FiberMax 832' (Table 2). Fiber bundle strength of FiberMax 832 was 14% stronger than Tamcot 22, but Tamcot 22 was equal to Tamcot Sphinx. Micronaire readings of Tamcot 22 averaged 4.2 compared with 4.8 for Tamcot Sphinx and 4.4 for FiberMax 832.

TAM 96WD-69s produced similar or higher yields (P = 0.05) than Sure-Grow 125, FiberMax 832, and Tamcot Sphinx in 20 of 23 performance trials and exhibited similar fiber quality traits (Tables 3 and 4). TAM 96WD-69s exhibited a lower lint percent (P = 0.05) than the comparison cultivars, similar upper half mean fiber length (UHM) (P = 0.05) to that of Sure-Grow 125 and Tamcot Sphinx, and fiber bundle strength was similar to (P = 0.05) Tamcot Sphinx and Sure-Grow 125 (Table 3). TAM 96WD-69s had 8% shorter UHM fiber length and 12% weaker fiber bundle strength than FiberMax 832 (Table 4). The micronaire reading of TAM 96WD-69s was 0.3 units lower than Tamcot Sphinx and Sure-Grow 125, but similar to that of FiberMax 832 (Tables 3 and 4).

Compared with Sure-Grow 125, Tamcot Sphinx, and FiberMax 832, TAM 96WD-18 was not different (P = 0.05) in yield potential when compared in performance trials averaged over multiple locations in 2000 – 2002 (Tables 5 and 6). The average upper half mean (UHM) fiber length of TAM 96WD-18 was similar (P = 0.05) to FiberMax 832, and 48% longer (P = 0.05) than that of Tamcot Sphinx and Sure-Grow 125. The mean high volume instrument fiber bundle strength of TAM 96WD-18 averaged 6% lower (P = 0.05) than FiberMax 832 (Table 6) but 7% and 17% stronger, respectively, than Tamcot Sphinx and Sure-Grow 125 (Table 5). Micronaire readings of TAM 96WD-18 was 2% lower (P = 0.05) than FiberMax 832 (Table 6), and 11% lower (P = 0.05) than the Sure-Grow 125 and Tamcot Sphinx (Table 5). Micronaire readings of TAM 96WD-18 deviated from the base range of 3.5 to 4.9 in only three of 23 performance trials between 2000 -2002.

Results from 13 performance trials conducted across seven locations in 2002 and six locations in 2003 indicated that TAM 98D-102 and TAM 98D-99ne yielded equal (P = 0.05) to 'SureGrow 747' and FiberMax 832. Upper half mean fiber length of TAM 98D-102 was longer (P = 0.05) than SureGrow 747 and TAM 98D-99ne but neither were as long as FiberMax 832 (Table 7). High volume instrument fiber bundle strength of TAM 98D-102 was higher (P = 0.05) than SureGrow 747 (28%) and FiberMax 832 (8%). TAM 98D-99ne was similar (P = 0.05) to FiberMax 832 in fiber bundle strength. Average micronaire reading of TAM 98D-102 was 4.4, similar (P = 0.05) to FiberMax 832 and lower than SureGrow 747. The average micronaire reading of TAM 98D-99ne was similar (P = 0.05) to SureGrow 747 (Table 7).

Tamcot 22 will be valuable to the cotton growers in 2006 as a conventional high yielding cultivar with good fiber quality. TAM 96WD-18 and TAM 98D-102 will be valuable to plant breeders interested in developing cultivars of upland cotton with improved yield potential and improved fiber strength and length. TAM 96WD-69s is valuable as a glabrous cultivar with excellent yield and good fiber quality combined with resistance to the cotton fleahopper. TAM 98D-99ne will be valuable to plant breeders in developing improved cultivars having good yield potential and quality along with the nectariless trait for host plant resistance. Small quantities of seed will be available for distribution until supplies are exhausted.

The Foundation Seed Service of the Texas Agricultural Experiment Station produces, maintains and sells foundation seed to producers of registered and certified classes. Tamcot 22 has U. S. Plant Variety Protection (PVP) requiring that it be sold by variety name only as a class of certified seed.

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Table 1. Average lint yield of Tamcot 96WD-22, Sure-Grow 125 and Tamcot Sphinx, 1998-2001.

Cultivar	Weslaco	Corpus Christi	College Station	Thrall	Uvalde	Weighted Average
Tamcot 22	1357 a	907 a	699 a	461 a	951 a	948
Sure-Grow 125	1216 ab	646 b	715 a	367 a	920 a	818
Tamcot Sphinx	1097 b	646 b	737 a	367 a	899 a	784

Values within columns followed by the same letter are not different at approximately p=0.05(k=100).
Weslaco (W), College Station (CS), and Uvalde (U) are irrigated sites while Corpus and Thrall are dryland.
W, CC = 4 yr
CS, T, U = 2 yr

Table 2. Average lint yield of Tamcot 96WD-22, Fibermax 832 and Tamcot Sphinx, 2001-2002 averaged over seven locations.

Cultivar	Lint Yield	Micro-naire	Length	Strength	Unifor-Mity
	lb/a	unit	in.	g/tex	Unit
Tamcot 22	900	4.2	1.10	27.1	81.8
Fibermax 832	771	4.4	1.17	33.0	83.8
Tamcot Sphinx	683	4.8	1.08	29.0	83.5
%CV	18.5	0.2	0.20	1.0	0.6
Mean	790	4.5	1.11	29.0	83.1

Values within columns followed by the same letter are not different at approximately p=0.05(k=100).

Table 3. Agronomic and fiber properties of 96WD-69s compared to Suregrow 125 and Tamcot Sphinx averaged over 2000 and 2001 and seven locations .

Cultivar	Lint yield	Lint percent	Micro naire	Length	Strength	Unifor mity	Elon-Gation
	(lb/a)	(%)	(units)	(in)	(g/tex)	(ratio)	(%)
96WD-69s	786a	34.7b	4.3b	1.08b	28.1a	81.7b	6.3a
Suregrow 125	682b	35.7b	4.6a	1.08b	28.8a	83.1a	5.4b
Tamcot Sphinx	708ab	36.6a	4.6a	1.1a	26.3b	83.3a	6.3a
%CV	14.5	3.0	8.9	2.2	6.1	1.4	6.0
Mean	725	35.7	4.5	1.09	27.8	82.7	7.3

Table 4. Agronomic and fiber properties of 96WD-69s compared to Fibermax 832 and Tamcot Sphinx averaged over 2001 and 2002 and seven locations.

Cultivar	Lint yield	Lint percent	Micro naire	Length	Strength	Unifor mity	Elon-Gation
	(lb/a)	(%)	(units)	(in)	(g/tex)	(ratio)	(%)
96WD-69s	1237a	37.1b	4.4b	1.07b	29.0c	82.0c	6.2a
Fibermax 832	1155b	38.4a	4.4b	1.16a	32.6a	83.7a	4.6c
Tamcot Sphinx	1009c	38.0a	4.7a	1.07b	30.2b	83.1b	4.9b
%CV	13.9	2.1	4.6	3.0	4.0	1.13	8.1
Mean	1140	37.9	4.5	1.10	30.6	82.9	5.2

Table 5. Agronomic performance and fiber quality comparing 96WD-18 to Sure-Grow 125 and Tamcot Sphinx averaged over 8 locations for 2000 and 2001.

Cultivar	Lint yield	Lint prcent	Micro -naire	Length	Strength	Unifor- mity	Elon- Gation
	(lb/a)	(%)	(units)	(in)	(g/tex)	(ratio)	(%)
96WD-18	720a	35.6b	4.0b	1.17a	30.9a	83.3a	6.1a
Sure-Grow 125	686a	36.8a	4.5a	1.09b	26.4c	83.3a	6.3a
Tamcot Sphinx	660a	35.7b	4.5a	1.08b	29.0b	83.1a	5.4b
%CV	17.5	3.4	8.4	2.0	5.5	1.6	6.4
Mean	689	36.1	4.4	1.11	28.8	83.2	5.9

Table 6. Lint yield, lint percent and fiber quality comparing 96WD-18 to FiberMax 832 and Tamcot Sphinx averaged over 7 locations for 2001 and 2002.

Cultivar	Lint yield	Lint percent	Micro naire	Length	Strength	Unifor- mity	Elon- gation
	(lb/a)	(%)	(units)	(in)	(g/tex)	(ratio)	(%)
96WD-18	717a	36.4a	4.3c	1.16a	31.2b	83.7a	5.5a
FiberMax 832	771a	37.4a	4.4b	1.17a	33.0a	83.8a	4.5c
%CV	21.8	8.6	6.6	2.6	4.8	0.9	6.8
Mean	726	37.0	4.5	1.13	31.0	83.7	5.2

Table 7. Agronomic performance and fiber quality of 98D-102 and 98D-99ne averaged over seven locations in 2002 and six lo

Cultivar	Lint Yield	Lint Turnout	Micro- naire	Length	Strength	Unifor- mity
	(lb/ac)	(%)	(units)	(in)	(g/tex)	(ratio)
98D-102	1025 a	37.0 c	4.4 b	1.14 b	36.2 a	84.2 a
98D-99ne	1062 a	38.0 b	4.8 a	1.12 c	33.9 b	84.2 a
FiberMax 832	919 a	37.2 c	4.3 b	1.19 a	33.6 b	84.3 a
Suregrow 747	1045 a	39.5 a	4.8 a	1.10 d	28.2 c	83.9 a
% CV	20.1	2.5	6.1	1.5	4	0.9
Mean	1013	37.9	4.6	1.14	33.0	84.2