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Introduction

'Top 76-6' is a sweet sorghum [*Sorghum bicolor* adapted to the southeastern USA and developed for sirup production in the Appalachian Mountain region. Initial emasculation crosses were made at the USDA Sugar Crops Field Station (now closed) at Meridian, MS. Preliminary evaluations were conducted in Mississippi during the early generations of selection and Georgia evaluations began in 1974 (2). The cultivar was jointly released by The University of Georgia and Mississippi State University during 1994. The cultivar produces a strong stalk with excellent standability and has very good disease resistance, including foliar/stalk-rot anthracnose and fusarium stalk-rot resistance.

The name 'Top 76-6' is in honor of Mr. Jim Dobson, superintendent (retired) of the Georgia Mountain Branch Station in Blairsville. Mr. Dobson had a keen interest in the sweet sorghum industry in the mountains of north Georgia.

'Top 76-6' was selected from the F2 progeny of the emasculated cross [Mer. 60-2 x 'Brandes']. Mer. 60-2 parentage (5) was [PI154844 (MN 1500) x PI152967 (MN 1056)]. Brandes (1) parentage was [Collier 706-C x PI154844]. The pedigree method of breeding was used to advance the progeny. The cultivar has been periodically evaluated since 1974 as Mer. 76-6 at the Georgia Mountain Branch Experiment Station, Blairsville, GA and Georgia Station, Griffin, GA.

Seed and Panicle Characteristics

The seeds of 'Top 76-6' are phenotypically white with a corneous endosperm. The sienna-colored glumes cover about one-third of the caryopsis. The exposed seed surface is usually sprinkled with red or dark-red specks. The seeds are elliptically shaped and contain no pigmented testa. The panicle is erect and semicompact.

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Agronomic Characteristics

The cultivar is similar to 'Dale' and 'Bailey' in maturity. 'Top 76-6' is normally shorter in height than 'Dale' and 'Bailey' (3,4); but at Verona and Blacksville, it was equal in height to 'Dale'; and at Alcorn A&M it was taller. Among agronomic data averaged over two years (table 1), 'Top 76-6' was shorter than 'Dale' and 'Bailey' and in 1993 had no lodging, whereas 'Late Orange' and 'Waconia Orange' lodged 82% and 29%, respectively. Standability of a sweet sorghum cultivar is extremely important because lodging causes cessation of sugar production and leaves the stalks useless for processing into sirup. This cultivar has exhibited no lodging problems (table 1).

'Top 76-6' is highly resistant to foliar anthracnose caused by *Colletotrichum graminicola* (Ces.) G. W. Wils. (table 1). A 10-location (Georgia: Griffin, Blairsville; Alabama: Alcorn A&M, Crossville; Mississippi: Verona, Newton; Virginia: Orange; Florida: Quincy; Kentucky: Quicksand; South Carolina: Blacksville) disease evaluation during the late 1970s and early 1980s revealed good to intermediate (noninjurious) resistance to grey leaf spot (*Cercospora sorghi* Ell. & Ev.), zonate leaf spot (*Gloeocercospora sorghi* D. Bain & Edg.), rough leaf spot (*Ascochyta sorghina* Saccardo), bacterial leaf stripe [*Pseudomonas andropogoni* (E. F. Smith) Stapp], and pokkah boeng (twisted top caused by *Fusarium moniliforme* var. *subglutinans*). Maize dwarf mosaic virus was recorded on the cultivar at only one location—Crossville, AL—but it was only a light infection and did not injure the plants (Nat Zummo, personal communication). The cultivar is resistant to injury from methyl parathion and other commonly used insecticides. This cultivar withstood a severe infestation of fusarium leaf blight and stalk-rot at Blairsville, GA during 1994 when most other commonly grown sweet sorghums were devastated by the disease.

Optimum plant population for this cultivar is 35,000 to 40,000 plants per acre. Sweet sorghum seed weighs 56 pounds per bushel and this cultivar has approximately 20,000 seeds per pound.

Performance

Juice brix, sugar yield, yield of sirup, stalk and juice yield, height, lodging and disease rating at Blairsville for 1992, 1993 and average over two years are presented in table 1. 'Top 76-6' has a brix equal to 'Dale' and slightly higher than 'Bailey'. Sugar yield is comparable to 'Dale' and 'Della', but lower than 'Bailey'. Sirup yield is equal to 'M81-E' and 'Dale', but less than 'Bailey'. Stalk tonnage yield is similar to 'Dale' and less than 'Bailey'. A look at agronomic data averaged over five or six years (table 2) at Blairsville and Griffin, GA, respectively, indicates excellent brix, adequate sirup yield, good juice extraction capability, and higher (though nonsignificant) percent sucrose and juice purity. Although juice production is low compared to 'Bailey', the good disease resistance, short stature, good standability, and high quality sirup of 'Top 76-6' give the cultivar market appeal in North Georgia and the Appalachian region.

References and Notes

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Table 1. Comparison of Eight Sweet Sorghum Cultivars at Blairsville, Georgia, 1992 to 1993 and Two-Year Average

			Yield of Sirup		Yield				
Cultivar	Juice Brix degrees	Sugar Yield lbs/A	per ton of stalks	per acre	stalks tons/A	juice gal/A	Height inches	Lodging %	Disease[a] rating
1992									
Top 76-6	*16.2*	*2008*	*11.3*	*233*	*20.7*	*3025*	*133*	*0*	*1.0*
Bailey	14.0	3332	9.7	388	39.8	5808	149	0	1.0
Dale	15.2	2391	10.5	278	26.4	4174	150	0	1.0
Della	14.4	2401	12.1	279	23.0	3469	156	0	1.0
Late Orange	17.2	2817	12.0	328	27.3	4054	140	0	1.0
M81-E	12.4	2510	8.7	292	33.7	5022	150	0	1.0
Theis	15.8	2405	10.9	280	25.6	3600	152	0	1.0
Waconia Orange	13.2	2386	9.2	277	30.2	4921	141	0	1.0
Average	15.2	2513	10.6	292	28.1	4210	146	-	1.0
LSD(0.05)	0.9	589	0.6	69	6.1	930	10	-	-
C.V.%	4	16	4	16	15	15	5	-	-
1993									
Top 76-6	*16.0*	*2439*	*11.2*	*284*	*25.6*	*3267*	*126*	*0*	*1.1*
Bailey	16.7	2755	11.6	320	27.5	3388	150	0	1.1
Dale	17.1	2089	11.9	243	20.4	2360	145	1	1.0
Della	17.6	2230	12.2	259	21.2	2602	128	4	2.7
Late Orange	12.1	1203	8.4	140	16.5	2360	125	82	2.2
M81-E	13.2	1843	9.1	214	23.3	2964	138	4	1.3
Theis	15.2	1799	10.6	209	19.7	2480	131	1	1.5
Waconia Orange	13.6	1170	9.4	136	14.4	1876	108	29	2.5
Average	15.2	1941	10.6	226	21.1	2662	131	15	1.7
LSD(.05)	1.2	370	0.8	43	3.6	521	6	15	1.4
C.V.%	6	13	6	13	12	13	3	68	57
2-yr. average (1992-1993)									
Top 76-6	*16.1*	*2223*	*11.2*	*259*	*23.2*	*3146*	*130*	-	-
Bailey	15.4	3002	10.8	349	32.8	4598	149	-	-
Dale	16.1	2240	11.2	260	23.4	3267	147	-	-
Della	17.5	2303	12.2	268	22.0	3036	140	-	-

Table 1 (continued)

Cultivar	Juice Brix degrees	Sugar Yield lbs/A	Yield of Sirup per ton of stalks	Yield of Sirup per acre	Yield stalks tons/A	Yield juice gal/A	Height inches	Lodging %	Disease[a] rating
Theis	15.5	2102	10.8	244	22.6	3040	142	-	-
Waconia Orange	13.4	1691	9.3	197	21.2	3398	122	-	-
Average	15.2	2213	10.6	258	24.4	3436	138	-	-
LSD(.05)	0.7	335	0.5	39	3.5	523	6	-	-
C.V.%	5	15	5	15	14	15	4	-	-

a. 1 = Resistant, 5 = Susceptible (anthracnose caused by *Colletotrichum graminicola*).

Table 2. Agronomic Data for the Production of Sweet Sorghum at Two Sites in Georgia[a]

Cultivar	Juice Brix degrees	Yield of sirup per ton of stalks	Yield of sirup per acre	Yield stalks tons/A	Juice analysis Extraction	Sucrose	Purity	Starch
					%			
Blairsville (5-yr. average)								
Top 76-6	*18.4*	*15.5*	*334*	*21.9*	*51.0*	*3.7*	*20.4*	*0.2*
Bailey	15.9	13.8	403	29.0	52.4	2.4	15.5	0.2
Dale	15.9	12.8	254	21.2	48.8	1.9	12.5	0.3
M81-E	12.1	9.9	207	21.1	49.7	2.1	16.7	0.2
Theis	14.5	11.8	237	20.0	48.5	2.9	20.4	0.2
Average	15.4	12.8	287	22.6	50.1	2.6	17.1	0.2
LSD(0.05)	1.7	2.5	94	3.8	3.8	N.S.	N.S.	0.1
Griffin (6-yr. average)								
Top 76-6	*18.7*	*13.6*	*261*	*18.0*	*45.0*	*5.9*	*30.5*	*0.2*
Dale	20.3	13.7	231	15.9	42.9	4.3	20.2	0.4
M81-E	15.9	11.9	291	20.2	48.4	2.8	16.1	0.2
Theis	18.2	12.9	243	18.4	43.2	2.8	14.6	0.2
Average	18.3	13.0	256	18.1	44.9	4.0	20.4	0.2
LSD(0.05)	1.9	N.S.	75	4.0	5.6	N.S.	N.S.	N.S.

a. Extrapolated from (2).