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'M 81E'---A New Variety of Sweet Sorghum

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all with
USDA, ARS
U. S. Sugar Crops Field Station
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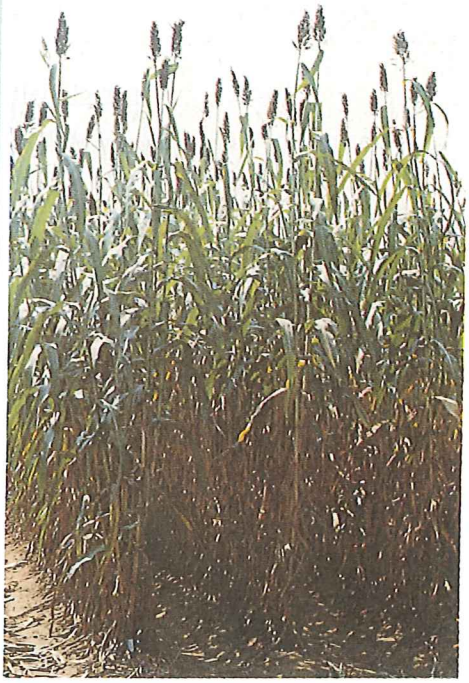
'M 81E' is a new sweet sorghum variety for sirup and fermentable sugar production. The variety was developed at the U. S. Sugar Crops Field Station, Meridian, Miss., in the cooperative research program of USDA, ARS and the Agricultural Experiment Stations of Alabama, Florida, Georgia, Kentucky, Mississippi and South Carolina. The name M 81E was chosen to show that the variety was developed at Meridian, Miss. (M), released in 1981 (81) and has potential as a source of energy (E).

Cooperative tests during the past four years in Alabama, Florida, Georgia, Kentucky, Mississippi and South Carolina have demonstrated the suitability of M 81E for sirup and fermentable sugar production. These tests were conducted at the Sand Mountain Substation, Crossville, Ala.; Agricultural Research and Education Center, Quincy, Fla.; Georgia Mountain Branch Station, Blairsville, Ga.; Robinson Substation, Quicksand, Ky.; MAFES Alcorn Branch, Lorman, Miss.; U. S. Sugar Crops Field Station, Meridian, Miss.; MAFES Coastal Plain Branch, Newton, Miss.; MAFES Northeast Branch Verona, Miss.; and Edisto Experiment Station, Blackville, S.C.

Typical panicle of M 81E.



Typical M 81E sweet sorghum plants.

History

M 81E was selected from the F_2 progeny of the cross 'Brawley' x (Brawley x 'Rio') in 1967. Progeny-row selection continued through the F_6 generation. M 81E was advanced to the agronomy nursery in 1972 and evaluated under the breeding number Mer. 71-1. After two years of testing at Meridian, the cultivar was evaluated for four years in the regional agronomic variety tests in Alabama, Florida, Georgia, Kentucky, Mississippi and South Carolina.

USDA, ARS
U. S. Sugar Crops Field Station, Meridian, Miss.
and
Alabama, Florida, Georgia, Kentucky and South Carolina Agricultural Experiment Stations
in cooperation with

MAFES MISSISSIPPI AGRICULTURAL & FORESTRY EXPERIMENT STATION
R. RODNEY FOIL, DIRECTOR MISSISSIPPI STATE, MS 39762

Mississippi State University
James D. McComas, President Louis N. Wise, Vice President

Test Results

M 81E generally has been superior to Theis in yield of gross and stripped stalks, sirup and fermentable sugar per acre (Tables 1 and 2). Juice production of M 81E exceeded that of Theis, but the Brix of the juice of M 81E generally is slightly lower than that of Theis.

The juice from M 81E has not failed to boil to sirup density (108°C) in 38 tests. The variety has adequate starch in the juice to give the sirup body but not enough to interfere with sirup manufacture. The sirup from M 81E has mild sorghum flavor, amber color and excellent quality.

The seed of M 81E usually are superior in germination to those of Theis. The new variety is well adapted to the Southeastern part of the United States.

Table 1. Comparative data for 'M 81E' and 'Theis' in Alabama, Florida, Georgia, Kentucky, Mississippi and South Carolina, by location of tests, averages of three or four years of tests, 1974-1977.

Location	Years tested	Yield of stalks Gross		Yield of stalks Stripped		Lodging		Brix		Yield of sirup per Ton Stalks		Yield of sirup per Acre		Fermentable sugar per Ton Stalks		Fermentable sugar per Acre	
		M 81E	Theis	M 81E	Theis	M 81E	Theis	M 81E	Theis	M 81E	Theis	M 81E	Theis	M 81E	Theis	M 81E	Theis
		tons per acre				%				gallons				pounds			
Alabama																	
Crossville	4	28.5+	24.7	19.9+	16.9	20	21	15.4	18.2	13.7	12.9	272	222	231	273	4,597	4,614
Florida																	
Quincy	3	30.9+	26.2	21.1+	18.1	1	0	17.3+	15.7	11.1	12.3	236	225	260	236	5,475	4,262
Georgia																	
Blairsville	4	35.5+	29.7	21.9+	18.7	4	3	12.2	14.6	10.0	11.2	217	208	183	219	4,008	4,095
Experiment	4	28.2	29.4	19.5	21.4	0	0	17.0	18.3	13.8	14.4	333	310	255	274	4,972	5,874
Kentucky																	
Quicksand	4	30.1+	26.5	21.9+	20.0	4	1	13.9	15.2	12.6	10.0	276	186	208	228	4,566	4,560
Mississippi																	
Lorman	4	23.4+	19.5	16.8+	14.1	2	31	16.7	17.7	13.7	13.6	232	198	250	266	4,208	3,744
Meridian	4	32.9+	26.7	23.8+	21.1	0	0	16.6	17.2	14.0	13.1	336	247	249	258	5,926	5,444
Newton	4	26.3+	22.2	18.5+	15.7	5	8	14.2	17.0	11.4	12.5	211	196	213	255	3,940	4,004
Verona	3	30.9+	26.5	21.6+	19.4	1	2	17.7	17.6	12.5	12.1	265	231	266	264	5,735	5,122
South Carolina																	
Blacksville	4	27.4	25.3	19.2+	17.2	0	0	15.9	18.4	12.7	13.8	248	244	238	276	4,597	4,747
Mean		29.4	25.7	20.4	18.3	4	7	15.7	17.0	12.6	12.6	263	227	235	255	4,801	4,647

+M 81E superior to Theis (p-.05).

Table 2. Comparative data for 'M 81E' and 'Theis' at Meridian, Miss., 1978-80 averages.

Variety	Yield of stalks Gross	Yield of stalks Stripped		Leaves		Heads		Dry seed	Stalk fiber	Juice Extraction	Juice Brix	Fermentable sugar per Ton Stalks	Fermentable sugar per Acre
		green	dry	green	dry	green	dry						
	tons per acre								%			Pounds	
M 81E	35.6+	28.4+	8.0+	4.7+	2.2+	1.8+	1.3+	0.86+	12.0	47.2+	17.2	259	7,403+
Theis	30.1	24.6	7.1	3.4	1.5	1.0	0.7	0.39	13.0	42.3	17.4	260	6,425
Mean	32.8	26.5	7.6	4.0	1.8	1.4	1.0	0.62	12.5	44.8	17.3	260	6,914

+M 81E superior to Theis (p-.05).

Description of M 81E

M 81E is a late maturing variety that matures about one week later than 'Theis'. It is similar to Theis in height but has more leaves, produces more seed and is more resistant to plant lodging than is Theis.

The panicle is erect and semi-compact. Pubescence on the black glumes is semideciduous except on the edges and callus where the hairs are longer and more persistent. The indurate glumes have a sharp apex and cover about one fourth of the caryopses. The glumes do not clasp the seed at maturity and are nonpersistent in the threshed seed. The midsized, brown and elliptic-shaped seed have an awnless lemma. The seed coat is underlain by a brown subcoat. M 81E has an endosperm that is mostly starchy. The coleoptile is green.

Disease Resistance

M 81E is highly resistant to leaf anthracnose and stalk red rot, both caused by *Colletotrichum graminicola* (Ces.) G. W. Wils. It has good resistance to downy mildew [(*Peronosclerospora sorghi*)Weston and Uppall]. It is susceptible to maize dwarf virus (MDMV) and rust (*Puccinia purpurea* Cke.) but tolerates most cotton insecticides.

Cooperators

ALABAMA:
Auburn: C. S. Hoveland, professor of crops
Crossville: J. T. Eason, superintendent, and M. E. Ruf, associate superintendent
FLORIDA:
Quincy: I. D. Teare, center director and R. L. Stanley, Jr., associate professor of agronomy and forage crops
MISSISSIPPI:
Lorman: S. C. Tiwari, associate professor and project leader, plant science
Newton: W. A. Brock, superintendent and Tommy G. Sanders, associate agronomist
Verona: R. C. Albritton, superintendent
SOUTH CAROLINA:
J. R. Hill, resident director and R. F. Suman, associate professor of agronomy
GEORGIA:
Blairsville: J. W. Dobson, Jr., superintendent and C. D. Fisher, associate professor of agronomy
Experiment: R. R. Duncan, associate professor, sorghum breeding/physiology assistant
KENTUCKY:
Lexington: M. J. Bitzer, associate extension professor, Grain Crops
Quicksand: G. A. Armstrong, superintendent

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