

Mississippi State University
AGRICULTURAL EXPERIMENT STATION

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STATE COLLEGE

MISSISSIPPI

DALE, A NEW VARIETY OF SWEET SORGHUM FOR SIRUP PRODUCTION

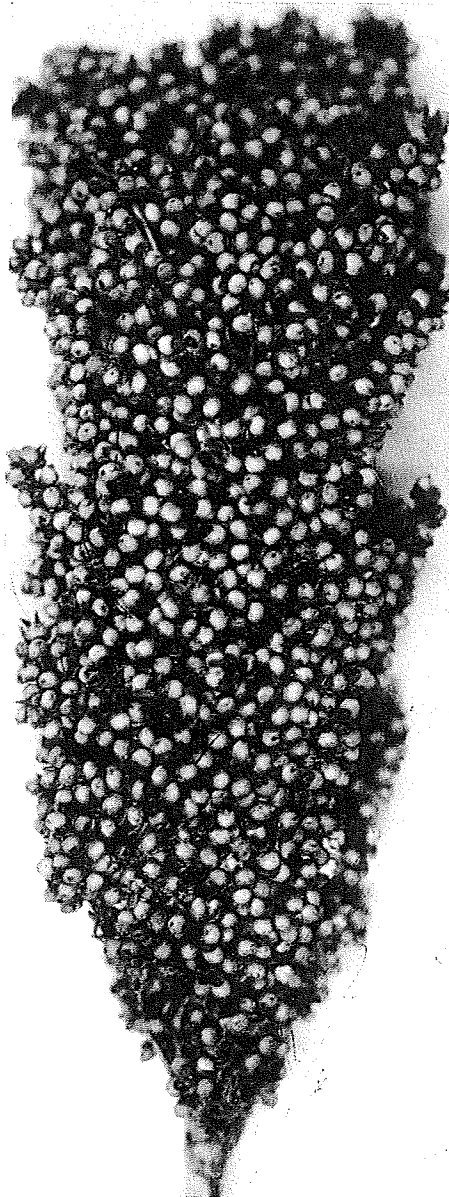
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Dale, a new mid-season sweet sorghum variety with superior disease resistance, was developed at the U.S. Sugar Crops Field Station, Meridian, Mississippi, in the cooperative breeding program of the Crops Research Division of Agricultural Research Service and the Mississippi Agricultural Experiment Station. This variety is adapted for sirup production throughout Mississippi.

The name "Dale" was chosen in honor of the late General Sam Dale (1772-1841), who was a Federal scout, soldier, and first representative in the Mississippi Legislature from Lauderdale County.

Cooperative tests during the past 4 years at experiment stations throughout Mississippi have demonstrated the high disease resistance of "Dale". These tests were conducted at the North Mississippi Branch Station, Holly Springs; Coastal Plain Branch Station, Newton. Pontotoc Ridge-Flatwoods Branch Station, Pontotoc; South Mississippi Branch Station, Poplarville; Northeast Branch



Dale, a new sweet sorghum for sirup

Station, Verona; Alcorn A & M College, Lorman; and U. S. Sugar Crops Field Station, Meridian.

Description of Dale

Dale is a mid-season variety that matures about 3 weeks earlier than Brandes and Wiley. It is similar, in appearance, to Tracy and matures about the same time. It is, however, resistant to leaf anthracnose and stalk red rot whereas Tracy is susceptible. These two are the most prevalent and destructive diseases of sweet sorghum in southeastern United States. Dale is tolerant to cotton insecticides. It has a medium length panicle, somewhat erect and compact, and which approaches a cylindroid in shape. The glumes cover about one-third of the seed, and are reddish brown to blackish, with tufts of hyaline pubescence at the base, apex, and margins.

The seeds are small and thresh free and they vary from obovoid to globose in shape. Seed color varies from light to dark reddish brown, and it is often somewhat lighter where exposed. The endosperm is starchy, with a medium to thick corneous layer surrounding a chalky white center. It does not have the brown subcoat.

Experimental Results

Results for the past 4 years at eight stations in Mississippi are reported in Table 1. The yield of millable stalks per acre of Dale averaged 72% of Wiley, but ranged from a low of 63% at Verona to a high of 89% at Pontotoc Ridge.

Dale lodged seriously at three locations. Brandes lodged at two of these. In each case the excessive lodging was caused by strong winds on the perimeter of a hurricane. The average lodging for Brandes, Dale, and Wiley, respectively, was 10, 16, and 26.

The two most important characteristics of a variety for sirup are gallons of sirup produced per ton of millable stalks and sirup quality. Wiley is the standard. Dale averaged 106% of Wiley in sirup per ton of stalks, and was less than Wiley only when grown on the Pontotoc Ridge-Flatwoods Branch Station. One year at that location, the juice failed to

¹Cooperative investigations of the Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture, and Mississippi Agricultural Experiment Station.

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boil to commercial sirup density. This was the only failure of Dale to make high quality sirup out of the 28 tests. Dale normally has adequate starch to give the sirup body, but not enough to interfere with manufacture.

The sirup made from Dale has a mild sorghum flavor, good color and is of excellent quality. Processing Dale juice into sirup is somewhat more difficult than from Wiley but is as easy as from other available varieties.

Dale produced 80% as many gallons of sirup per acre as Wiley and 90% as much as Brandes even though it is about 3 weeks earlier than these two late varieties.

Dale produces seed of a high germination that hold up well during storage as compared to Wiley.

Disease Resistance

Dale is highly resistant to leaf anthracnose and stalk red rot. It is the only mid-season sirup variety available to sirup producers which is resistant to these two prevalent destructive diseases. It is tolerant but not highly resistant to cotton insecticides.

History

Dale is a selection from the progeny of the fourth back-cross between Tracy and MN 960 (P.I. 152857), with Tracy as the recurrent parent. The crosses were made at Meridian, Mississippi.

The first cross was made in the greenhouse in the spring of 1960 between Tracy and MN 960 (P.I. 152857). Tracy is a selection out of the cross White African X Sumac made at Chillicothe, Texas, under the breeding number S. A.



Dale, growing in Mississippi

169 and reselected at Meridian, Mississippi. MN 960 was collected by Carl O. Grassl in Equatoria, Africa, in 1945. Tracy is susceptible to leaf anthracnose and stalk red rot caused by *Colletotrichum graminicolum* (Cés.) G. W. Wils. whereas MN 960 is resistant.

The first backcross was made in the fall of 1960 in the field by using the F₁ as the female parent and produced 16 seeds. Tracy was the female parent for the second, third, and fourth backcrosses. The 4 second backcrosses produced 95 seeds; the 5 third backcrosses produced 390 seeds and the 10 fourth backcrosses

produced 763 seeds. Pollen for each backcross (2, 3, 4) was collected from single plants growing in the same areas and resembling Tracy in every aspect, except disease resistance.

Twenty-four highly anthracnose resistant lines from the fourth backcross generation were evaluated as potential commercial varieties in 1964. Two years prior to release, head to row selections of Dale were evaluated for anthracnose resistance. Only those lines that showed no anthracnose after being inoculated were used as sources of seed for this new variety.

Table 1. Comparative data of the sirup varieties Dale and Brandes in Mississippi, 1966-69.

Locations	: Number : years : or : tests	: Yield :		: Lodging :		: Brix :		: Sirup/ton :		: Sirup/acre :		: Days :	
		: percent :		: percent :		: percent :		: percent :		: percent :		: to :	
		: Dale :	: Brandes :	: Dale :	: Brandes :	: Dale :	: Brandes :	: Dale :	: Brandes :	: Dale :	: Brandes :	: Dale :	: Brandes :
Holly Springs	4	76	82	12	0	104	98	106	87	81	72	128	139
Lorman	4	88	101	1	0	110	98	115	92	102	94	125	154
Meridian	4	75	98	32	25	96	100	98	101	74	102	120	144
Newton	3	70	95	33	7	115	117	120	118	84	113	130	144
Pontotoc:													
Flatwoods	4	84	88	1	0	100	106	75	101	62	88	132	145
Ridge	4	89	94	2	0	102	104	107	102	94	96	127	141
Poplarville	2	69	83	50	50	110	92	118	86	82	72	112	130
Verona	3	63	66	0	0	100	93	111	92	60	70	136	152
TOTAL NO. TESTS	28												
AVERAGE		77	88	16	10	105	101	106	97	80	88	126	144