

Sorghum Variety Demonstration^{1/}

Barry R. Tickes, Yuma County Agricultural Agent; and David K. Parsons, Assistant Extension Specialist--
Field Testing. University of Arizona, 1981.

Red Mountain Farms Yuma County

Elevation: 600 feet

Crop History:

Planted: July 12, 1980

Harvested: Nov. 15, 1980

Seeding Rate: 13 lbs/acre

Previous Crop: Barley

Fertilizer:

Source	Lbs/A	Time of Application	Lbs N/A
UN32	50	Prior to Heading	16
Irrigation water	--	During Irrigations	92
			108

Irrigation: 4.2 acre feet/acre were applied through a center pivot.

Plot size: 3.17 x 20'

Entry	Yield (lbs/plot) ^{2/}		Ave. Yield (lbs)	Yield (Calculated in lbs/acre)
	Rep 1	Rep 2		
DeKalb DK64	5.37	7.25	6.31	4340
Ferry Morse Advance 80	6.00	5.75	5.88	4040
Acco 1288	5.63	5.87	5.75	3950
Pioneer 8451	5.25	6.00	5.62	3870
Funks G-623GBR	4.37	6.25	5.31	3650
Asgrow Double TX	3.80	5.62	4.71	3240
DeKalb DK57	4.50	4.75	4.62	3180
NK 2779	4.50	4.38	4.44	3050
Funks G-522DR	3.00	3.50	3.25	2240
NK 265	3.00	3.00	3.00	2060
Ferry Morse Advance 14	3.12	1.37	2.24	1540

^{1/}Due to stand establishment problems small plots were hand harvested, bagged, dried to an equilibrium moisture and threshed for yield determinations on March 12, 1981.

^{2/}All yields adjusted to 10% moisture.

Phenotypic Performance for Maturity and Height for a Number of
Sweet and Sugar-Type Sorghums in Different Arizona Environments

Robert L. Voigt, Plant Breeder

Summary

A number of sweet or sugar-type sorghum genotypes were grown in three locations in Arizona varying from 110 to 6220 meters in elevation. Days to bloom ranged from 53 to 164 days among entries and locations indicating the importance of selecting the proper maturity to fit the local environment or crop rotation. There was a considerable range in plant heights among entries and locations.

The species sorghum has much genetic variability of plant characteristics. One of these characteristics is a sweet or sugary content of the stalk versus non-sweet. Some sorghum varieties have been grown for many years for sugar and syrup production. The current energy crisis has given cause to look at sweet-type sorghums for their potential as a source of energy for production of materials such as gasahol. Sorghum is also a warm season crop and has fast plant growth for good biomass production.

Arizona has much variation in elevation of agricultural areas which give quite different plant growth environments. The sorghum species also has a wide variation in phenotypic responses to these various environments. It is necessary to know how these sweet-type sorghums may perform in various farming areas of the state to fit into the local crop rotations if local growers are interested in growing this type of crop.

Sixty sorghum lines, varieties, or hybrids of some degree of sweetness (sugar or syrup) were grown at three locations in Arizona in 1980 for an evaluation of their bloom dates and heights at different elevations (temperatures). The three locations and their elevations were Yuma at 110 meters, Tucson at 1920 meters, and Lakeside at 6220 meters of elevation. The principal difference among these three locations as growth environments would be the temperature which in turn influences the maturity genotypes represented among the tested items. Due to space and seed problems not quite all 60 entries were grown at each of the three locations. Fifty-nine of the sixty entries were successfully grown at Tucson. One entry was lost at Tucson. Fifty-two entries were grown at Yuma and forty-two entries at Lakeside.

The names of the sixty entries evaluated, their maturities in days to 50% bloom, and heights in centimeters are given in Table 1 for the various locations in which they were grown.

The Yuma and Tucson locations were planted on May 9 and 6 respectively. Lakeside was not planted until June 13, which is later than desired. The Lakeside test was on a farmer's field and planting arrangements took considerable time.

There was a wide range in maturities at Yuma and Tucson. At Yuma the days to 50% bloom ranged from 57 to 164 days. The entry Funks 99F has a very late maturity characteristic and is sold for use as a continuously growing crop plant for repeated harvests without heading out, hence the late bloom date at Yuma. It remained vegetative throughout the season at Tucson. Tucson had a range of days to bloom of 53 to 128, not counting the one vegetative entry.

Lakeside, at an elevation of 6220 meters, was very cool throughout a short growing season. Only eight entries of the forty-two had flowered by September 24 which was near frost time and little more growth and development occurred. Thirteen entries were in the boot stage. The remaining twenty-one entries were still in the vegetative stage at the end of the season.

Nearly all entries were a few days later in maturity at Yuma compared to Tucson. It would be expected that most all entries would take longer to accumulate heat units in the high cool environment at Lakeside and thus take longer to bloom than at Yuma or Tucson. The few that did reach bloom at Lakeside illustrated this. The most important observation from these data is that there is a very wide range in maturities among currently available sweet sorghums. A grower should be aware of this so that he can select seed with a maturity to fit his local environment and crop rotation needs.

Average heights in centimeters to the top of the head is given for all entries at all locations that did head out. Entries at Yuma tended to be taller than at Tucson. The few that did head out at Lakeside were shorter than at the two lower elevations. There was a considerable range in heights among entries and locations.

Table 1. Agronomic Data on Maturity and Height of Sixty Sweet-Type Sorghums Grown at Three Locations in Arizona in 1980.

Entry No.	Entry	Days to 50% Bloom ^{1/}			Height in cm ^{2/}		
		Yuma 110m	Tucson 1920m	Lakeside ^{3/} 6220m	Yuma	Tucson	Lakeside
1	Black Amber		59			180	
2	Minnesota Amber	71	60	99	230	210	168
3	Red Amber		64			210	
4	Atlas	94	81	E. Boot	265	210	--
5	AZ 9504 B	90	84	Veg.	192	153	--
6	Brandes	139	125	Veg.	290	245	--
7	Brawley	90	78	Veg.	262	245	--
8	Collier	81	66	E. Boot	350	240	--
9	Dale	113	97	Veg.	305	265	--
10	Georgia Blue Ribbon		90			222	
11	Gooseneck	95			275		
12	Hodo		Veg.			230	
13	Honey	105	91	Veg.	332	255	--
14	Honey Drip		74			230	
15	Keller	101	99	Veg.	326	307	--
16	Leoti	73	63	Boot	252	205	--
17	MER 71-1	137	122	Veg.	360	280	--
18	Early African Millet	90	76	Veg.	270	255	--
19	Orange Cane	81	83	Veg.	276	280	--
20	Kansas Orange	91	83		250	222	
21	Rox	82	73	Veg.	235	240	--
22	Ramada	123	79	104	330	255	61
23	Rancher	57	53	105	190	170	92
24	Red Top	75	77	Veg.	240	255	--
25	Rex	90	92	Veg.	342	210	--
26	Rio	97	94	Boot	330	255	--
27	Roma	117	92	104	330	235	71
28	Sart	150	125	102	360	295	97
29	Sourless	98	92		252	230	
30	Sourless Orange	90	83	Veg.	285	230	--
31	Shrock		81			185	
32	Sugar Drip	94	96	Veg.	307	255	--
33	Sumac	74	72	E. Boot	250	230	--
34	Early Sumac	74	69	E. Boot	232	205	--
35	Medium Dwarf Sumac	80	70	Veg.	225	205	--
36	Theis	150	127	Veg.	410	315	--
37	Tracy	109	100	Veg.	395	280	--
38	Wiley	150	128		375	305	
39	Williams	90	86	Veg.	304	265	--
40	Wrey	94	96	Veg.	295	255	--
41	White African Millet		96			280	
42	Ellis		71			215	
43	Asgrow 114 x 301	82	80	E. Boot	262	205	--
44	Cargill 250 S	82	80	Boot	260	175	--
45	Conlee Agolene	87	83	E. Boot	306	190	--
46	Conlee NRG	87	87	Veg.	350	230	--
47	DeKalb FS4	81	77	99	305	255	97
48	DeKalb FS25a+	125	81	106	290	215	91
49	P-A-G Morcane	81	70	E. Boot	242	230	--
50	Taylor-Evans Goldmaker	82	77	E. Boot	275	255	--
51	Young Red Top Kandy	122	86	Boot	375	280	--
52	Brawley-BMR	80	63		260	185	
53	R10-BMR	82	77		304	205	
54	GSA Growers 30F	124	83	E. Boot	298	205	--
55	GSA 1586F	124	119	Veg.	325	305	--

Table 1. Continued.

Entry No.	Entry	Days to 50% Bloom ^{1/}			Height in cm ^{2/}		
		Yuma 110m	Tucson 1920m	Lakeside ^{3/} 6220m	Yuma	Tucson	Lakeside
56	Funks 102F	108	79		252	215	
57	Funks 102S	105	79		272	230	
58	Funks 99F	164	Veg.		310	305	
59	Funks HW 4060	80	73		258	215	
60	NK X 7984 F	74	62	110	235	215	61

^{1/} Planted in moisture: Yuma = 9 May 1980
 Tucson = 6 May 1980
 Lakeside = 13 June 1980

^{2/} Plant height was measured to the top of the average plant head.

^{3/} Those entries that didn't flower are indicated as vegetative, in early boot or in the boot stage.

Corn Variety Demonstration

Larry Sullivan, Cochise County Agricultural Agent; and David K. Parsons, Assistant Extension Specialist--
 Field Testing, University of Arizona.

Robert Haas Cochise County

Elevation: 4400 feet

Crop History:

Planted: April 17, 1980

Harvested: October 2, 1980

Seeding Rate: 33,000 plants/A

Previous Crop: Corn

Insecticides: 10 lbs of Furadan (1.0 lb of active ingredient/A) were incorporated at planting. One quart/acre of Sevimol 4 (1.0 lb active ingredient/acre) was applied 3 times during the growing season. Molasses is included in this formulation.

Weed Control: Three quarts of Sutan and 3 quarts/acre each of Bladex were incorporated prior to planting.

Cultivation: One cultivation was performed.

Fertilization:

Amount/A	Source	Time of Application	lbs. N/acre	lbs. P ₂ O ₅ /acre
250	18-46-0	Prior to planting	45	115
300	NH ₃	Prior to planting	250	
300	UN32	1st to 21st of July divided into 5 appli- cations	96	
Total			391	115

Soil Analysis^{1/}

Date of Sample: 3-18-80

pH = 6.4 (paste with distilled H₂O);

EC_e x 10³ = 0.8 (to convert EC_e x 10³ to soluble salts, multiply EC_e x 10³ x 700);

Soluble salts = 560 ppm

N = 26 ppm (Nitrate reported as N. To convert N to NO₃, multiply N x 4.4);

P = 44 ppm (Bray P. Phosphate reported as P. To convert P to PO₄, multiply P by 3.1).

Plant Analysis:^{1/}

Date of Sample: 6-24-80

Growth Stage: 8-10 leaf

Plant part: whole plant