Grain Sorghum Production in South-Central Arizona II: Full Season, Limited Irrigation 1985

Robert Voigt and Carl Schmalzel

ABSTRACT

Seventy-two commercial hybrid grain sorghums representing 17 commercial seed companies were grown full season for grain yield with limited irrigation for medium moisture stress. The test, grown at the University of Arizona Marana Agricultural Center, had grain yields ranging from a high of 5098 lbs/acre down to 2100 lbs/acre.

INTRODUCTION

New grain sorghum hybrids are being continually offered for sale commercially. Commercial seed companies do not always fully evaluate their products for adaptation to the small agricultural areas of Arizona. The purpose of this test was to furnish local growers with information on currently available commercial hybrid grain sorghums and to also furnish this information to the seed companies for guidance in their sales.

MATERIALS AND METHODS

Seventy-two commercial hybrid grain sorghums were evaluated for grain production and other agronomic characteristics in a full season irrigated field test on the University of Arizona Marana Agricultural Center in 1985. The test was planted in moisture on May 16, 1985, in single rows 20 feet long on beds 40 inches apart and replicated four times in a randomized block design. Sixty-four lbs/acre of nitrogen and 80 lbs/acre of phosphate was applied preplant in 400 lbs/acre of 16-20-0. Atrazine was applied, post emergence, at 1 1/2 lbs/acre of active ingredient for weed control.

The test received 27.90 acre-inches of irrigation water and 1.78 acre-inches of rainfall for a total moisture availability of 29.68 acre-inches. The test was combine-harvested on September 24-30, 1985. Agronomic data were obtained on the number of days to 50% bloom, plant height to the top of the head, percent bird damage and lodging, grain yield per acre and grain test weight.

RESULTS AND DISCUSSION

The results presented in Table 1 are ranked in descending order of grain yield, corrected for the bird damage, with amounts indicated. The corrected yields with bird damages of up to 25 to 30% may be considered as quite accurate. The adjusted yields of entries with higher bird damage of 40 to 70% may be considered rather questionable.

A statistical analysis of variance of the yield data gave a "least significant difference" (LSD) of 1729 lbs/acre at a 5% level of probability. Any two yields that differ by more than 1729 lbs/acre can be considered to be different by a probability of 95% or not different by a probability of only 5%.

The ten highest yielding entries had an average of 71.4 days to 50% bloom, produced 150 lbs/acre of grain per acre-inch of water received and produced 43.9 lbs of grain per acre per day of growth (measured as days to 50% bloom plus 30 days for maturity).

Table 1. Grain yield and other agronomic data from a full season commercial hybrid grain sorghum yield test grown with minimum irrigation at the Marana Agricultural Center, University of Arizona, 1985

Yield Rank	Variety	Days To 50% Bloom	Height[1]/ (in.)	% Bird[2]/ Damage	% Lodging	Yield[3]/ (Lb/A)	Test Wt (Lb/Bu)
1	Paymaster 1091	71	44	1	35	5098	48.14
2	PAG 5572	70	41	5	4	4708	51.09
3	Funks G-522DR	71	41	2	15	4572	53.57
4	Young, RC Oro G Xtra	74	42	2	15	4538	52.11
5	Triumph Two 54YG	72	46	16	13	4389	52.99
6	Funks G-1711	71	42	4	16	4323	53.06
7	Pioneer 8501	69	43	8	8	4285	55.94
8	Paymaster DR1125	72	40	0	6	4271	50.27
9	PAG 6670	72	40	3	18	4189	51.02
10	SeedTec WAC 715DR	72	48	6	51	4136	53.65
11	NC+ 174	72	41	0	25	4128	53.46
12	GroAgri GSA 1290	70	40	1	0	4042	52.90
13	SeedTec WAC D701G	71	43	1	38	4016	51.47
14	SeedTec WAC 710DR	70	41	2	3	3952	49.60
15	Richardson 9322	76	45	2	8	3946	54.13
16	Asgrow H8206	74	44	2	4	3881	53.22
17	Richardson 9300	76	42	0	5	3880	55.41
18	SeedTec WAC 652G	72	45	15	3	3865	52.94
19	Stauffer S9750	73	42	1	18	3854	50.53
20	Pioneer 8515	73	44	2	3	3813	54.24
21	DeKalb DK 59E	74	42	0	3	3782	54.22
22	Taylor-Evans Dinero	72	40	0	6	3769	49.71
23	Triumph Two 70D	70	39	0	21	3764	48.18
24	NC+ 159	67	38	3	0	3759	56.98
25	Warner, G. W-876DR	71	41	2	10	3696	49.31
26	Stauffer S9736	72	39	0	9	3693	49.47
27	Asgrow Topaz	71	40	2	8	3642	52.02
28	RS 610	61	37	11	3	3629	54.66
29	Asgrow Corral	71	45	8	5	3623	53.68
30	RS 626	60	34	10	0	3563	53.98
31	Pioneer 8493	74	39	1	2	3539	50.51
32	Taylor-Evans Tuff	74	36	0	0	3484	44.34
33	Conlee Rustler	73	41	0	31	3441	52.61
34	Funks HW6845	74	41	0	1	3438	49.80
35	Warner, G. W-839A	77	38	0	0	3434	

(Table continued following page)

Yield Rank	Variety	Days To 50% Bloom	Height1/ (in.)	% Bird2/ Damage	% Lodging	Yield3/ (Lb/A)	Test Wt (Lb/Bu)
36	DeKalb DK 64	80	46	2	3	3421	56.03
37	Paymaster R109A	75	38	0	6	3407	48.54
38	Conlee EXP85320	69	44	11	36	3406	53.10
39	Conlee EXP85323	67	48	7	1	3373	57.07
40	Conlee Ranger	72	43	1	1	3360	51.49
41	Taylor-Evans Y-101-G	76	41	1	0	3342	53.18
42	PAG 4462	73	45	2	50	3331	51.62
43	Young, RC Oro G	73	37	0	3	3301	49.31
44	Funks G-550	62	36	1	1	3242	53.20
45	Warner, G. W-839DR	71	38	1	28	3233	51.90
46	Stauffer 734GR	79	40	0	0	3218	53.73
47	GroAgri GSA 1180	69	41	2	4	3198	53.39
48	Asgrow Mesa	71	41	1	1	3194	51.81
49	GroAgri GSA 1210B	74	41	3	2	3191	51.55
50	SeedTec WAC 692	74	38	0	9	3161	46.70
51	Richardson 5483	64	41	22	11	3143	56.58
52	Triumph Two 50YG	60	32	7	1	3094	55.81
53	Conlee EXP85321	75	46	1	9	3073	52.37
54	Conlee Rawhide	74	38	0	4	3024	49.41
55	California IV80H40	76	48	0	10	3022	53.02
56	GroAgri GSC 1313	78	42	0	2	3014	54.77
57	Paymaster 1099	78	39	0	0	3006	52.34
58	NC+ 270	81	41	0	0	2948	52.45
69	Young, RC Oro Rec10	65	40	6	1	2924	53.70
60	NC+ 165	75	43	3	0	2909	53.07
61	Cargill 70	79	38	0	0	2905	53.66
62	DeKalb DK 41y	77	40	0	0	2754	53.41
63	Triumph Two 48YG	57	29	15	0	2750	56.67
64	SeedTec WAC 692G	79	40	0	0	2744	53.70
65	GroAgri GSA 1212	79	39	0	0	2669	
66	Triumph Two 62YG	76	38	0	2	2423	47.71
67	Stauffer 677GR	77	41	0	0	2378	52.54
68	Warner, G. W-864T	77	37	0	1	2301	
69	Cargill 55	81	41	0	0	2230	
70	NC+ 262	74	38	0	0	2187	53.82
71	PAG 5665	81	39	0	0	2169	54.05
72	Funks RA 808	76	40	0	3	2100	51.58

1/Average height to the top of the head.
2/Average percent bird damage across all three replications of each entry.
Grain yields are corrected for this damage.
3/LSD .05 = 1040 Lb, C.V. = 22%.