

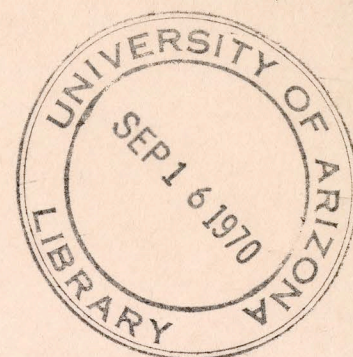
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REPORT 258



**ARIZONA
GRAIN SORGHUM,
FORAGE SORGHUM,
AND
SUDANGRASS
PERFORMANCE TESTS**

by

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1969

ARIZONA AGRICULTURAL EXPERIMENT STATION
THE UNIVERSITY OF ARIZONA
TUCSON

ARIZONA GRAIN SORGHUM, FORAGE SORGHUM

AND SUDANGRASS PERFORMANCE TESTS

1969

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Acco Seed
Division of Anderson, Clayton & Company
(Formerly Paymaster)

Advance Seed & Grain Company
Division of Ferry-Morse Seed Company

Asgrow Seed Company

DeKalb Agricultural Association, Inc. (DK)^{1/}

Excel Sorghum Company

Frontier Hybrids, Inc.

Funks Bros. Seed Co. of Texas, Inc.
(Formerly Lindsey)

McNair Seed Company

Northrup King & Company

Pfister Associated Growers, Inc. (P-A-G)^{1/}

Pioneer Sorghum Company

Rudy-Patrick Seed Division
W. R. Grace & Company

Taylor-Evans Seed Company (T.E.)^{1/}

1/ Abbreviations used in this publication

INTRODUCTION

There were 205,000 acres of sorghums of all kinds grown in Arizona in 1969. This acreage was just a little less than 17% of the total cultivated acreage in the state and was 34,000 acres less than grown in 1968. The state average yield of grain was down slightly from 1968 but forage sorghum was up as shown in Table 1. Arizona ranked second in the nation in average state yield of grain and first for forage yields. This is a tribute to the Arizona Grower for his good management and use of improved cultural methods, fertilizers, and seed. A wide variation in Arizona agricultural environments, caused by a range in altitude from sea level to as high as sorghum will grow and produce (over 6000 feet in elevation), makes management decisions an interesting challenge.

Table 1

Arizona Crop Acreages and Yields
of Various Sorghum Products in 1969^{1/}

Crop	1969 Acreages	1969 Yields	1968 Yields	1967 Yields
Grain Sorghum	199,000	78.0 bu/acre	79.0 bu/acre	81.0 bu/acre
Forage Sorghum	5,000	21.0 tons/acre	18.0 tons/acre	20.5 tons/acre

Sorghum research was conducted at six locations in Arizona in 1969. These sites were selected for their environmental differences which are due primarily to altitude. All sorghum test results in this report were obtained under irrigated conditions.

^{1/} Figures obtained from official USDA acreage releases.

Various meteorological data concerning these locations are given in Table 2. Evaluation of sorghums under these different environments in Arizona is done to learn more about the highly variable genus (sorghum) and to guide the Arizona grower in selecting something better suited to his particular area. Formal crop recommendations are given in a Crop Recommendation Bulletin published periodically by The University of Arizona Experiment Station. The purpose of this report is to give more detailed information on particular items.

Table 2

Average Meteorological Data for Sites of 1969 Research Experiments

Location	Elevation in Feet Above Sea Level	Average Dates of <u>Killing Frosts</u>		Average Length of Growing Season (Days)
		Last	First	
Yuma Valley Exp. Farm	150	Feb. 20	Nov. 26	280
Mesa Exp. Farm	1100	Feb. 25	Nov. 25	273
Marana Exp. Farm ^{1/}	2000	Mar. 1	Nov. 15	260
Safford Exp. Farm	2900	Apr. 9	Nov. 2	207
Willcox Field Plots	4300			
Snowflake Research Plots	5600	May 24	Oct. 3	132

^{1/} Data estimated from nearby weather stations.

GRAIN SORGHUM

The following experiments were conducted to evaluate various grain sorghums available to Arizona growers. Nearly all grain sorghums grown are hybrids. Few, if any, varieties are grown.

It was not possible to evaluate fully all hybrids under all of the different environments in the state. Observational data were obtained at three locations (Yuma, Marana, and Snowflake) which gives us a good idea of the general range of adaptation of each entry in respect to maturity relative to different environments. Yield data were obtained on all entries at one central location (Marana). Only selected hybrids were evaluated under various environments at other locations in Arizona.

Most yields are shown as percentages of RS 610, a common check hybrid, which is now or has been generally grown throughout the state. The reason for presenting data in this manner is that yields may be relative among entries from location to location. One grower may produce an average yield twice that of another grower due to land and management differences, but if the yield potential of a new hybrid is 10 per cent more than a known standard, this potential difference percentage may be found by either grower. Many growers may be acquainted with the performance of RS 610 on his own particular farm. Where statistical yield analyses have been made, all entries under the same line or lines should be considered not different at the five per cent level of probability. Generally, with no other information available, a later maturing entry, weather and seasonal plans permitting, should be considered for highest yield potential.

Various research data on grain sorghums are presented in tables 3 to 17. These tables are in order of the lowest elevation (environment) at Yuma to the highest elevation (environment) at Snowflake.

Table 3 presents data on a selected list of hybrids planted early at Yuma. Sterility problems prevented obtaining yield data on the regrowth of this test or a late planting of the same entries. Table 4 presents bloom (maturity) data for all of these tests and root deterioration data on the late planting.

Tables 5 and 6 present data on some released public hybrids and some experimental hybrids grown at Yuma and Marana.

All hybrids were divided by maturity into three groups --- early, midseason, and late, and tested by groups at Marana. These results are presented in Tables 7, 8, and 9. Two-year average yields of selected hybrids are presented in Table 10 and three-year average yields in Table 11.

Some agronomic data for the Safford area are presented in Table 12. Birds destroyed all yield data.

Table 13 presents data from a yield test near Willcox, Arizona in one of the top grain sorghum production areas of Arizona. Table 14 is a two-year average of selected entries for this location.

Table 15 presents data from selected early-maturing hybrids grown at Snowflake.

Table 16 presents general observational data on all grain sorghums evaluated in 1969 under three different environments.

Table 17 gives values of correlations of yield with days to bloom for several tests. The highest and most positive correlations were for the March 22 planting at Yuma and the May 2 planting at Willcox. Both of these plantings were made about as early as could be done for the locations. All other plantings were made after first possible planting dates in their respective areas and showed much lower correlations, even slightly negative. An interpretation of these data might be that in plantings made as early as possible, later maturities may be expected to yield the most. In plantings made later in the season maturities may not play as great a role in yield.

In 1969 most plots used were two beds (single row per bed) each 30 feet long. The seeding rate was approximately at 12 pounds of seed per acre, such that the expected plant population was from 130,000 to 140,000 plants per acre. Nitrogen was the main fertilizer needed and used. It was applied at a rate considered favorable for optimum crop growth at each test location. This rate varied from 100 to 200 pounds of available "N".

Table 3. Yield and Other Agronomic Data From a Hybrid Grain Sorghum Production Trial at Yuma, Arizona. 1969^{1/}

Entry	Yield in Lbs/Acre ^{2/}	Days to 50% Bloom	Height in Inches	Head Exsertion in Inches	Per Cent Lodging	Per Cent Bird Damage ^{3/}	Test Wt. in Lbs/Bu.
Northrup King 280	7600	79	60	6	1	16	56.5
Asgrow Red Raider A	7306	76	49	6	0	2	57.0
Asgrow Rico	6992	76	54	7	0	12	56.4
Taylor Evans 66	6966	76	49	7	0	1	57.3
DeKalb Br-62	6541	79	70	8	0	1	56.5
DeKalb C 44 B	6528	68	51	6	0	9	58.0
Northrup King 265	6437	72	56	6	0	32	58.9
Pioneer 846	6437	73	54	7	0	11	57.2
Northrup King 310	5881	68	64	8	1	35	58.4
Asgrow Double T	5417	76	58	7	0	34	56.2
Acco 1029	5084	76	53	6	0	7	55.7
Funks 744	4653	70	53	7	0	33	59.0
Taylor Evans 77	4607	78	63	7	0	45	56.1
Acco 920	4561	61	48	7	2	8	56.6
DeKalb DD 50	2954	65	51	8	1	64	56.8
Advance 19	2869	60	50	7	0	52	58.0
Acco Pawnee	2751	60	53	8	0	71	57.0
Northrup King 125	2437	61	49	8	0	72	57.0

^{1/} Planted March 22, 1969 in moisture. Harvested July 25, 1969.

^{2/} Plots = 2 rows (40 inches) x 25 feet. 4 replications.

^{3/} Plot yields were corrected for bird damage.

Table 4. Maturity and Root Disease Data from Grain Sorghums Under Environments at Yuma, 1969.

Entry	Days to 50% Bloom				Root Condition Index ^{1/} of July 14 Planting
	When:				
	Planted March 22	Regrowth July 28	Planted July 14		
Acco Pawnee	60	29	52	6.2	
Advance 19	60	29	52	4.0	
Acco 920	61	29	44	7.2	
Northrup King 125	61	23	43	5.2	
Asgrow Rico	76	43	54	7.0	
Asgrow Double T	76	46	62	9.8	
DeKalb C44B	68	34	53	3.5	
Acco 1029	76	44	59	6.8	
DeKalb DD 50	65	29	53	5.8	
Funks 744	70	40	56	7.5	
Northrup King 265	72	42	57	6.8	
Pioneer 846	73	40	57	5.2	
Asgrow Red Raider A	76	44	54	7.2	
Taylor Evans 66	76	44	54	7.2	
DeKalb Br-62	79	44	60	4.8	
Northrup King 280	79	42	56	6.5	
Northrup King 310	68	49	73	6.8	
Taylor Evans 77	78	46	61	9.2	

^{1/} Root Condition Index by Dr. Joseph Troutman, November 19, 1969, on a scale of 1 to 10. 1 = Normal healthy root system, 10 = very poor, deteriorated root system.

Table 5. Yield and Other Agronomic Data From a Single Harvest USDA Regional Hybrid Grain Sorghum Production Trial at Yuma, Arizona 1969. ^{1/}

Entry ^{2/}	Yield ^{3/} in Lbs/Acre	Yield in Percent of RS 610	Days to 50% Bloom	Height in Inches	Head Exsertion In Inches	Test Weight In Lbs.
NB 684418	5102	117	54	46	2	52.0
1795 E	4649	106	60	45	4	51.0
Arkansas 653	4574	105	53	44	4	48.3
RS 671	4456	102	57	45	4	49.0
RS 610	4373	100	53	47	4	50.0
RS 633	4147	95	53	46	2	50.5
RS 690	3870	89	59	38	1	52.5
KS 65 MH 338	3837	88	66	45	2	49.7
Arkansas 663	3451	79	57	56	4	47.3
NB 684433	3393	78	53	46	6	48.0
RS 703	3351	77	60	48	3	49.3
KS 65 MH 340	3049	70	67	48	2	48.0
NB 684428	2957	68	60	48	2	47.0
KS 64 MH 343	2840	65	67	48	4	47.0
NB 505	2513	58	46	46	6	47.5
Martin	2262	52	54	43	4	49.7
Arkansas 68001	2010	46	59	54	4	47.0

^{1/} Planted in moisture May 26, 1969. Harvested September 3, 1969.

^{2/} No lodging observed in any entries.

^{3/} Plots = 1 Row (40 inches) x 26 feet. 3 replications.

Table 6. Yield and Other Agronomic Data From a Single Harvest USDA Regional Hybrid Grain Sorghum Production Trial at Marana, Arizona 1969.^{1/}

Entry ^{2/}	Yield ^{3/} in Lbs/Acre	Yield in Per Cent of RS 610	Days to 50% Bloom	Height in Inches	Head Exsertion in Inches	Test Wt. in Lbs
NB 684418	5340	107	60	52	4	57.4
RS 671	4992	101	63	53	6	56.4
RS 610	4976	100	58	51	4	56.7
NK 310A	4679	94	80	51	3	57.6
KS 65 MH 338	4524	91	65	54	6	57.1
1795 E	4522	91	63	52	6	56.1
Arkansas 653	4490	90	61	53	6	54.1
NB 684433	4456	90	59	49	4	58.6
RS 633	4420	89	61	51	6	57.6
Arkansas 663	4390	88	66	64	8	55.1
KS 65 MH 340	4373	88	66	56	7	56.8
KS 64 MH 343	4289	86	66	52	5	57.4
RS 690	4062	82	64	51	4	57.6
RS 703	4038	81	65	52	6	56.0
NB 684428	3937	79	63	52	4	58.0
NB 684426	3803	76	62	56	6	58.8
NB 505	3166	64	55	49	6	56.9
Arkansas 68001	3116	63	67	58	6	55.4
Martin	2865	58	63	50	6	57.2

^{1/} Planted dry June 4, 1969; Irrigated June 8, 1969; Harvested November 1, 1969.

^{2/} No lodging observed in any entries.

^{3/} Plots = 1 row (40 inches) x 26 feet. 3 replications.

Table 7. Yield and Other Agronomic Data From a Single Harvest Grain Sorghum Production Trial of Early Maturing Hybrids at Marana, Arizona, 1969.1/

Entry	Yield in Lbs/Acre ^{2/}	Yield in Per Cent of RS 610	Days to 50% Bloom	Height In Inches	Head Exsertion In Inches	Test Wt. In Lbs/Bu.
Advance 22	5303	102	56	46	8	56.2
DeKalb C-42A	5287	102	58	46	7	54.4
T. E. Grainmaster A	5216	100	60	48	6	55.8
RS 610	5197	100	61	52	6	56.2
Advance 61W	5162	99	60	52	6	53.6
Pioneer 885	5113	98	58	46	8	55.0
Northrup King 222	5096	98	58	46	5	55.8
DeKalb C-45	5042	97	55	43	7	57.2
Frontier Super 400	4998	96	58	46	5	56.0
P-A-G 430	4997	96	60	48	6	57.4
Acco Pawnee	4971	96	54	49	6	57.3
Acco R-920	4944	95	53	43	9	53.6
P-A-G 429	4939	95	60	44	6	57.2
T. E. Mucho	4873	94	60	48	5	55.8
Frontier Grassy Grain I	4868	94	53	46	10	54.6
Advance 55	4841	93	61	48	6	55.8
Advance 19	4797	92	54	44	8	55.4
Pioneer 883	4666	90	56	45	6	55.8
P-A-G 353	4661	90	57	44	7	55.4
Northrup King 125	4606	89	52	46	10	52.1
DeKalb A-25	4519	87	51	42	7	52.8
Taylor Evans 66B	4514	87	63	46	6	56.9
Acco R-94	4269	82	53	46	9	56.4

1/ Planted dry June 2, 1969, irrigated June 6, 1969. Harvested October 16 & 18, 1969.

2/ Plots = 2 rows (40 inches) x 30 feet. Four replications.

Table 8. Yield and Other Agronomic Data From a Single Harvest Grain Sorghum Production Trial of Mid-season Maturing Commercial Entries at Marana, Arizona. 1969.1/

Entry	Yield in Lbs/Acre ^{2/}	Yield in Per Cent of RS 610	Days to 50% Bloom	Height in Inches	Head Exsertion In Inches	Test Wt. in Lbs/Bu.
Excel Bird-Go	6202 a	122	64	52	6	52.8
Acco R-1093	6088 ab	120	61	52	6	50.0
Acco R-1029	5717 abc	113	60	50	4	54.4
McNair 546	5619 bcd	111	62	50	3	51.4
Frontier 409	5592 bcde	110	62	50	4	54.3
Acco R-109	5516 cdef	109	63	48	4	57.0
Pioneer 846	5510 cdefg	108	61	54	7	55.1
McNair 652	5418 cdefgh	107	62	54	6	55.2
Funks G-522	5396 cdefgh	106	63	48	5	57.8
DeKalb X-1555	5369 cdefghi	106	64	48	6	57.4
Arkansas 614	5342 cdefghi	105	61	50	4	50.4
T. E. Exp. 6913-S	5336 cdefghi	105	68	70	8	57.5
RS 626	5314 cdefghi	105	59	48	8	53.0
Northrup King 280	5265 cdefghij	104	63	53	5	55.0
Northrup King 265	5222 cdefghij	103	60	53	4	55.8
Advance 14	5135 cdefghijk	101	61	52	6	57.4
Frontier 400C	5124 defghijk	101	60	52	6	56.8
Asgrow Double TX	5107 defghijk	100	65	54	8	56.4
Excel 505	5086 defghijkl	100	61	52	8	56.4
RS 610	5077 defghijkl	100	60	54	7	53.6
Northrup King 210	4998 efghijklm	98	60	52	7	53.8
Asgrow Rico	4993 fghijklm	98	61	50	5	57.0
Pioneer 850	4971 fghijklmn	98	66	50	8	56.0
Acco R-102	4966 fghijklmn	98	60	47	6	52.2
RS 625	4944 fghijklmn	97	58	50	7	53.8
Northrup King 210A	4911 ghijklmn	97	59	50	7	54.6
Pioneer 848	4911 ghijklmn	97	62	50	7	57.0
T.E. Exp. 18114	4911 ghijklmn	97	65	52	7	56.4
T.E. Exp. 6909-S	4900 hijklmn	96	68	70	8	55.8

1/ Planted dry June 3, 1969, irrigated June 6, 1969.

2/ Plot = 2 rows (40 inches) x 30 feet

Table 8. Continued

Entry	Yield in Lbs/Acre ^{2/}	Yield in Per Cent of RS 610	Days to 50% Bloom	Height in Inches	Head Exsertion In Inches	Test Wt. in Lbs/Bu.
Amak R-10	4895	96	59	49	7	55.3
Advance Exp. 67-22-E	4873	96	56	44	8	53.0
DeKalb X-1551	4857	96	66	52	4	56.8
Excel 707A	4852	96	64	52	7	56.3
Funks G-585	4846	95	64	54	7	56.5
Asgrow Flare	4786	94	61	51	8	56.0
DeKalb C44B	4775	94	57	50	8	54.0
Advance 76	4699	92	62	51	5	55.8
Northrup King 275	4694	92	64	55	6	56.6
DeKalb E-55	4677	92	62	48	4	55.0
Taylor Evans 66B	4672	92	62	46	6	57.0
P-A-G 655	4612	91	66	60	8	55.6
Acco R-1060	4606	91	64	52	6	56.7
DeKalb X-1554	4492	88	66	51	6	56.8
Amak R-12	4427	87	65	52	7	56.2
DeKalb E-57	4427	87	63	54	8	55.4
Asgrow Red Raider A	4421	87	62	45	6	56.8
Excel 606	4394	86	63	46	4	57.5
Asgrow Tasco	4383	86	61	51	8	56.8
Funks G-766	4285	84	68	58	9	56.2
Excel 707B	4274	84	67	55	8	56.8
Advance 85	4220	83	66	59	10	56.6
DeKalb DD-50	4171	82	56	47	8	53.8
Taylor Evans 44	4149	82	56	53	5	47.5
Acco R-1080	4122	81	64	47	4	57.4
T.E. Exp. 20107	4029	79	64	52	6	56.0
P-A-G 665	3920	77	68	56	6	57.0
Taylor Evans 44C	3752	74	55	46	8	55.1
DeKalb F-65	3724	73	67	50	6	56.1
Funks G-602	3474	68	66	50	8	57.0

Table 9. Yield and Other Agronomic Data From a Single Harvest Grain Sorghum Production Trial of Late Maturing Hybrids at Marana, Arizona, 1969.^{1/}

Entry	Yield in Lbs/Acre ^{2/}	Yield in Per Cent of RS 610	Days to 50% Bloom	Height in Inches	Head Exsertion In Inches	Test Wt. in Lbs/Bu.
Excel 733	4939	105	62	47	4	55.6
RS 610	4721	100	58	52	6	56.0
Advance 94	4650	98	65	59	9	56.4
Pioneer 828	4612	98	65	60	8	56.3
Pioneer 820	4596	97	63	56	9	55.9
DeKalb F-64	4470	95	64	62	10	57.7
DeKalb Br-62	4389	93	64	62	8	53.6
DeKalb C-48A	4389	93	60	50	4	54.9
Northrup King 310	4165	88	78	55	3	58.0
DeKalb Br-64	4127	87	65	68	12	54.4
P-A-G 655	3899	82	63	56	8	55.8
Northrup King 310A	3817	81	80	54	4	57.8
Acco R-2020	3795	80	64	54	8	56.8
Advance 91	3790	80	66	54	6	57.6
Taylor Evans 77	3708	78	65	56	7	57.2
Taylor Evans 88	3670	78	64	56	8	57.2
DeKalb F-61	3632	77	65	58	8	56.8
Texas 660	3604	76	62	54	6	56.8
Funks 788A	3365	71	65	54	6	55.2
P-A-G 665	3321	70	66	57	7	56.6
Asgrow Jumbo L	2036	43	94	54	2	55.0

^{1/} Planted dry June 4, 1969, irrigated June 8, 1969.

^{2/} Plots = 2 rows (40 inches) x 30 feet. Four replications.

Table 10. Average Yield Data for Two Years of Some Hybrid Grain Sorghums, Marana, Arizona.
1968-1969

Entry	Yields in Pounds Per Acre		Average	Rankings by Yield		
	1968	1969		1968	1969	1968-1969
Excel Bird-GO	6932	6202	6567	1	1	1
Acco R-1093	6017	6088	6052	11	2	2
Asgrow Double TX	6806	5107	5956	3	17	3
Frontier 409	5951	5592	5772	14	4	4
McNair 546	5842	5619	5730	21	3	5
Arkansas 614	6109	5342	5726	9	8	6
Northrup King 280	6120	5265	5692	8	11	7
Taylor Evans Grainmaster A	6126	5216	5671	7	13	8
DeKalb Br-62	6893	4389	5641	2	48	9
✓ RS 626	5930	5314	5622	16	9	10
Acco R-109	5598	5516	5557	32	5	11
McNair 652	5674	5418	5546	25	7	12
Northrup King 265	5848	5222	5535	20	12	13
Excel 505	5930	5086	5508	17	18	14
Asgrow Rico	5908	4993	5450	18	20	15
DeKalb E-55	6164	4677	5420	6	36	16
✓ Pioneer 846	5320	5510	5415	42	6	17
P-A-G 429	5875	4939	5407	19	25	18
DeKalb F-64	6295	4470	5382	5	43	19
Advance 14	5619	5135	5377	31	15	20
Asgrow Flare	5952	4786	5369	13	33	21
DeKalb Br-64	6382	4127	5254	4	54	22
Excel 707A	5652	4852	5252	29	30	23
Advance 61W	5260	5162	5211	43	14	24
Taylor Evans Mucho	5494	4873	5184	37	28	25
Northrup King 275	5663	4694	5178	28	35	26
Advance 55	5478	4841	5160	38	31	27
Amak R-10	5374	4895	5134	41	27	28
Pioneer 820	5576	4596	5086	33	41	29
DeKalb C-45	5125	5042	5084	47	19	30
Northrup King 310	6000	4165	5082	12	52	31
Frontier 400C	5039	5124	5082	50	16	32
Asgrow Red Raider A	5728	4421	5074	24	46	33

Table 10. Continued

Entry	Yields in Pounds Per Acre		Average	Rankings by Yield		
	1968	1969		1968	1969	1968-1969
Pioneer 828	5527	4612	5070	35	39	34
Acco Pawnee	5111	4971	5041	49	22	35
Asgrow Tasco	5668	4383	5026	27	50	36
Frontier Grassy Grain I	5156	4868	5012	45	29	37
Amak R-12	5573	4427	5000	34	44	38
DeKalb E-57	5527	4427	4977	36	45	39
P-A-G 430	4955	4977	4966	53	21	40
Northrup King 210A	4995	4911	4953	52	26	41
P-A-G 515	5220	4596	4908	44	42	42
Taylor Evans 77	6104	3708	4906	10	60	43
Northrup King 310A	5935	3817	4876	15	56	44
Acco R-1060	5124	4606	4865	48	40	45
Acco R-102	4683	4966	4824	55	23	46
Excel 606	5216	4394	4805	46	47	47
Advance 22	4187	5303	4745	59	10	48
Acco R-2020	5674	3795	4734	26	57	49
DeKalb C-44B	4640	4775	4708	56	34	50
DeKalb F-61	5772	3632	4702	22	62	51
Taylor Evans 88	5625	3670	4648	30	61	52
Excel 707B	4944	4274	4609	54	51	53
DeKalb F-65	5461	3724	4592	39	59	54
Acco R-1080	5037	4122	4580	51	55	55
Funks 788A	5750	3365	4558	23	64	56
Acco R-920	4182	4944	4563	60	24	57
P-A-G 665	5385	3620	4502	40	63	58
Pioneer 883	4311	4666	4488	58	37	59
DeKalb C-48A	4351	4389	4370	57	49	60
P-A-G 353	4031	4661	4346	62	38	61
Advance 19	3861	4797	4329	64	32	62
Taylor Evans 44	4016	4149	4082	63	53	63
Taylor Evans 44C	4080	3752	3916	61	58	64

Table 11. Average Yield Data for Three Years of Some Hybrid Grain Sorghums, Marana, Arizona.
1967-1968-1969

Entry	Yields in Pounds Per Acre				Average	Ranking by Yield			
	1967	1968	1969	1967-1969		1967	1968	1969	1967-1969
Excel Bird Go	6893	6932	6202	6676	2	1	1	1	1
Frontier 409	6485	5951	5592	6009	8	7	3	2	2
Arkansas 614	6338	6109	5342	5930	9	4	6	3	3
Excel 505	6665	5930	5086	5894	4	9	14	4	4
McNair 546	5946	5842	5619	5802	24	13	2	5	5
Pioneer 846	6501	5320	5510	5777	6	29	5	6	6
Acco R-109	6017	5598	5516	5710	22	19	4	7	7
Northrup King 280	5598	6120	5265	5661	35	3	9	8	8
Northrup King 210A	7013	4995	4911	5640	1	36	19	9	9
Frontier 400C	6730	5039	5124	5631	3	35	13	10	10
Asgrow Rico	5989	5908	4993	5630	23	11	16	11	11
RS 626	5625	5930	5314	5623	33	10	7	12	12
Excel 707A	6300	5652	4852	5601	10	16	22	13	13
Advance 14	6027	5619	5135	5594	21	18	12	14	14
Northrup King 265	5652	5848	5222	5574	32	12	10	15	15
Northrup King 275	6229	5663	4694	5529	14	15	26	16	16
Amak R-12	6545	5573	4427	5515	5	21	31	17	17
Amak R-10	6267	5374	4895	5512	12	28	20	18	18
DeKalb F-64	5679	6295	4470	5481	31	2	30	19	19
Pioneer 828	6289	5527	4612	5476	11	23	27	20	20
Acco Pawnee	6240	5111	4971	5411	13	34	17	21	21
DeKalb C-45	6055	5125	5042	5407	20	33	15	22	22
Advance 61W	5799	5260	5162	5407	28	30	11	23	23
Advance 55	5859	5478	4841	5393	26	25	23	24	24
Acco R-102	6501	4683	4966	5383	7	37	18	25	25
Pioneer 820	5924	5576	4596	5365	25	20	29	26	26
Taylor Evans 77	6137	6104	3708	5316	16	5	38	27	27
P-A-G 515	6094	5220	4596	5303	18	31	28	28	28
Asgrow Red Raider A	5701	5728	4421	5283	30	14	33	29	29
Taylor Evans Mucho	5342	5494	4873	5236	38	24	21	30	30
Advance 22	6186	4187	5303	5225	15	39	8	31	31
Northrup King 310	5505	6000	4165	5223	36	6	35	32	32

Table 11. Continued

Entry	Yields in Pounds Per Acre				1967-1969 Average	Ranking by Yield			
	1967	1968	1969	1969		1967	1968	1969	1967-1969
DeKalb E-57	5614	5527	4427	4427	5189	34	22	32	33
DeKalb C-44B	6098	4640	4775	4775	5171	17	32	25	34
Excel 606	5804	5216	4394	4394	5138	27	38	34	35
Taylor Evans 88	6093	5625	3670	3670	5129	19	17	39	36
P-A-G 665	5799	5385	3620	3620	4935	29	27	40	37
Northrup King 310A	5037	5935	3817	3817	4930	40	8	36	38
DeKalb F-65	5146	5461	3724	3724	4777	39	26	37	39
Advance 19	5380	3861	4797	4797	4679	37	40	24	40

Table 12. Agronomic Data From a Hybrid Grain Sorghum Test at Safford, Arizona. 1969^{1/}

Entry	Days to ^{2/} 50% Bloom	Height ^{3/} in Inches	Head ^{3/} Exsertion In Inches
Advance 91	83	36	0
Advance 94	83	42	1
Amak R-10	70	40	6
Amak R-12	78	44	4
Asgrow Double T	82	42	2
Asgrow Double Tx	78	50	4
DeKalb E-57	76	44	4
DeKalb F-61	84	44	1
DeKalb F-63	78	47	4
DeKalb F-64	82	48	2
DeKalb Br-64	82	50	4
DeKalb F-65	82	40	2
Excel 505	71	42	5
Excel 606	76	38	4
Excel 655	80	38	2
Excel 707	78	42	3
Excel 707A	78	44	4
Frontier 400-C	70	40	6
Funks 788A	81	43	2
McNair 546	79	39	1
Northrup-King 265	72	46	5
Northrup-King 275	78	41	4
Northrup-King 280	79	44	4
Northrup-King 310	88	48	4
Northrup-King 310A	92	48	4
P-A-G 515	80	42	4
P-A-G 665	83	44	2
Pioneer 820	80	42	1
Pioneer 828	83	44	2
Pioneer 846	74	43	5
Average	79	43	3

^{1/} Planted dry May 22, 1969, irrigated May 23, 1969.
This test was planted for yield data but bird damage was 100% on all entries but two - DeKalb Br-64 and McNair 546

^{2/} Four replications

^{3/} Two replications

Table 13. Agronomic Data From a Single Harvest Grain Sorghum Production Trial at Willcox, Arizona 1969^{1/}

Entry	Yield ^{2/} in Lbs/Acre	Days to 50% Bloom	Height in Inches	Test Wt. in Lbs/Bu
Asgrow Double TX	9082	87	57	56.1
DeKalb F-64	8328	98	61	59.8
Pioneer 820	7853	95	51	57.8
Pioneer 828	7728	89	57	57.8
DeKalb Br-64	7413	100	59	57.7
DeKalb F-61	7239	98	51	56.3
Northrup-King 280	7183	89	48	56.4
DeKalb E-55	7086	81	43	55.6
McNair 546	7065	96	46	54.4
Northrup-King 275	7050	83	49	57.0
Taylor Evans 77	7044	87	53	56.8
Asgrow Rico	7022	81	48	57.0
Advance 85	6806	95	57	56.7
Amak R-12	6723	83	53	57.1
Asgrow Double T	6660	86	51	56.6
Pioneer 846	6625	77	48	57.6
Funks 788A	6541	85	50	57.1
P-A-G 665	6513	86	52	57.2
P-A-G 515	6408	82	52	57.4
DeKalb F-65	6381	87	46	56.0
Taylor Evans 88	6367	84	50	56.8
Northrup-King 210A	6038	73	39	55.5
Northrup-King 222	5934	74	37	58.0
Asgrow Jumbo L	5814	77	50	56.3
Northrup-King 310	5752	79	55	57.8
Northrup-King 265	5703	76	46	56.8
Excel 505	5515	75	41	56.6
Northrup-King 310A	5431	76	53	57.3
Northrup-King 210	5201	72	40	55.8
Amak R-10	5096	72	40	57.0

^{1/} Grown on the E. O. Williams Farm, Planted in moisture May 2, 1969. Harvested October 9-10, 1969.

^{2/} Plots = 2 Rows (36 inches) x 26 feet, 4 replications. All entries under the same line or lines should be considered not different at the five per cent level of probability.

Table 14. Agronomic Data From Grain Sorghum Tests Over Two Years at Willcox, Arizona. 1968 and 1969.

Entry	1968 Yield in Lbs/Acre	1968 Rank	1969 Yield in Lbs/Acre	1969 Rank	Two Year Average Yield Lbs/Acre
DeKalb F-64	8335	2	8328	1	8332
DeKalb Br-64	8544	1	7413	4	7978
Pioneer 828	8097	5	7728	3	7912
DeKalb F-61	8321	3	7239	5	7780
Pioneer 820	7609	9	7853	2	7731
Taylor Evans 77	8070	6	7044	7	7557
Asgrow Double T	8104	4	6660	8	7382
McNair 546	7316	11	7065	6	7191
P-A-G 665	7846	7	6513	9	7180
Taylor Evans 88	7742	8	6367	11	7054
DeKalb F-65	7519	10	6381	10	6950
Northrup-King 310	6583	12	5752	12	6168
Northrup-King 310A	6122	13	5431	14	5776
Northrup-King 265	5103	14	5703	13	5403

Table 15. Yield and Other Agronomic Data From a Single Harvest Grain Sorghum Production Trial of Early Maturing Hybrids at Snowflake, Arizona, 1969^{1/}

Entry	Yield in Lbs/Acre	Yield ^{2/} in Kg/Ha	Days to 50% Bloom	Height in Inches	Head Exsertion In Inches	% Grain Wt. of Total Head Wt.	Per Cent Bird Damage
Acco R-920	4066	4557	87	48	11	79.6	0
Acco Pawnee	4050	4540	89	58	10	80.2	5
Advance 19	3635	4074	88	54	9	78.9	0
Frontier Grassy Grain I	3494	3916	83	54	12	78.3	0

^{1/} Planted May 16, 1969 in moisture. Harvested September 19, 1969.

^{2/} Plots = 2 rows (36 inches) x 20 feet. Four replications. There were no statistically significant differences among any of the entry yields.

Table 16. General Adaptation Data of Grain Sorghums Grown at Three Different Locations in Arizona During 1969. 1/ 2/

Entry	Days to 50% Bloom		Height in Inches		Head Exsertion In Inches Snowflake	Per Cent Bird Damage at Maturity Yuma	Seed Color at Maturity ^{3/} Yuma	Leaf Symptoms ^{4/} 0-5 Scale Yuma	
	Yuma	Marana	Snowflake	Yuma					Marana
Acco Pawnee	46	54	89	49	50	58	10	LRB	1
Acco R-94	46	53	88	42	45	48	9	LRB	2
Acco R-102	53	57	106	40	49	50	9	LRB	2
Acco R-109	59	64	108	42	48	43	4	RB	2
Acco R-920	44	51	88	39	44	52	11	LRB	2
Acco R-1029	53	62	104	40	50	49	7	RB	2
Acco R-1060	59	61	100	41	52	52	9	RB	2
Acco R-1080	59	60	103	37	44	44	7	RB	2
Acco R-1093	53	59	101	39	46	48	4	DRB	2
Acco R-2020	67	65	107	37	52	53	10	RB	3
Advance 14	53	61	106	37	49	52	7	RB	3
Advance 19	43	50	86	38	45	53	6	LRB	2
Advance 22	47	55	92	39	52	62	12	RB	2
Advance 55	49	60	106	34	53	54	8	LRB	3
Advance 61W	49	59	104	40	55	53	6	W	2
Advance 76	53	63	107	33	48	49	4	LRB	3
Advance 85	60	65	108	50	58	55	7	RB	3
Advance 91	64	66	112	40	50	48	6	LRB	2
Advance 94	64	65	109	42	53	58	10	LRB	2
Advance Exp. 67-22-E	49	56	104	36	50	53	7	LRB	2
Amak R-10	53	58	103	35	49	52	10	LRB	2
Amak R-12	56	63	104	45	52	56	9	LRB	2
Asgrow Flare	53	61	105	44	49	55	8	LRB	2
Asgrow Rico	53	60	100	48	48	50	5	LRB	2
Asgrow Tasco	53	60	100	50	48	54	11	LRB	2
Asgrow Red Raider A	56	60	105	38	43	43	7	LRB	3

1/ Location elevations: Yuma 150 feet; Marana 2,000 feet; Snowflake 5,600 feet.

2/ Planting dates: Yuma May 26 (in moisture); Marana June 4 (dry), Irrigated June 8; Snowflake May 16 (in moisture).

3/ Seed Color: RB = Reddish Brown LRB = Light Reddish Brown DRB = Dark Reddish Brown B = Brown W = White

4/ Leaf Symptoms: 0= No symptoms 5 = Severe chlorosis and/or desiccation

Table 16. Continued

Entry	Days to 50% Bloom		Height in Inches		Head Exsertion In Inches	Per Cent Bird Damage at Maturity	Seed Color at Maturity	Leaf Symptoms 0-5 Scale	
	Yuma	Marana	Snowflake	Snowflake					
Asgrow Double TX	56	63	108	47	51	56	8	LRB	3
Asgrow Jumbo L	81	97	102	43	51	54	7	LRB	3
Asgrow Robusto	70	87	95	53	62	63	8	LRB	1
DeKalb A-25	42	50	94	37	44	51	9	LRB	2
DeKalb Br-62	64	64	111	47	58	59	7	DRB	2
DeKalb Br-64	64	66	113	56	65	52	7	DRB	2
DeKalb C-42A	53	59	100	38	46	51	8	LRB	2
DeKalb C-44B	49	56	99	45	48	55	6	LRB	2
DeKalb C-45	47	56	102	45	40	46	5	LRB	2
DeKalb C-48A	53	61	101	44	49	47	4	LRB	3
DeKalb DD-50	49	57	99	44	48	52	8	LRB	2
DeKalb E-55	56	62	107	40	49	49	6	LRB	2
DeKalb E-57	53	65	109	44	55	52	9	LRB	2
DeKalb F-61	67	68	111	38	58	49	7	LRB	3
DeKalb F-64	59	66	112	53	63	59	10	LRB	3
DeKalb F-65	67	65	111	36	50	52	8	RB	3
DeKalb X-1551	59	63	112	43	52	45	3	RB	3
DeKalb X-1554	59	64	110	37	49	46	4	RB	3
DeKalb X-1555	56	63	111	39	43	42	6	LRB	2
Excel Bird-Go	56	63	110	52	51	60	7	B	2
Excel 505	53	59	107	46	51	53	7	LRB	2
Excel 606	57	61	109	39	46	41	5	LRB	3
Excel 707A	54	63	111	45	53	52	11	LRB	2
Excel 707B	64	65	110	47	55	50	8	LRB	3
Excel 733	54	62	108	42	47	41	6	LRB	2
Frontier 409	54	61	108	44	47	47	5	DRB	2
Frontier Grassy Grain I	43	52	88	44	48	57	10	DRB	2
Frontier Super 400	49	58	104	39	43	53	7	LRB	3
Frontier 400C	49	59	99	46	47	57	12	LRB	2
Funks 788A	67	65	103	41	53	55	10	LRB	3
Funks G-522	56	64	108	40	50	44	6	RB	2
Funks G-585	56	62	105	39	47	49	7	LRB	2

Table 16. Continued

Entry	Days to 50% Bloom		Height in Inches		Head Exsertion In Inches	Per Cent Bird Damage at Maturity	Seed Color at Maturity	Leaf Symptoms 0-5 Scale		
	Yuma	Marana	Snowflake	Snowflake					Yuma	Yuma
Funks G-602	67	65	106	37	49	45	8	0	RB	3
Funks G-766	70	66	112	40	53	49	9	0	W	4
McNair 546	54	62	110	43	49	46	6	0	B	2
McNair 652	54	62	109	56	56	55	9	10	LRB	2
Northrup King 125	43	51	93	47	43	51	3	15	LRB	2
Northrup King 210	49	59	98	49	50	54	10	40	LRB	2
Northrup King 210A	49	59	101	43	48	53	9	15	LRB	3
Northrup King 222	49	60	102	39	46	49	6	1	LRB	2
Northrup King 265	49	58	104	47	47	56	9	5	LRB	3
Northrup King 275	54	63	106	42	52	53	7	2	LRB	4
Northrup King 280	54	61	105	42	48	54	8	0	RB	4
Northrup King 310	70	79	98	45	52	57	9	10	LRB	3
Northrup King 310A	81	81	99	45	51	56	10	5	LRB	3
Northrup King 218S	56	61	108	38	49	57	9	0	RB	4
Northrup King 330	47	91	110	90	83	76	4	15	RB	2
P-A-G 353	49	56	95	39	42	46	11	0	RB	3
P-A-G 429	49	58	104	39	43	47	7	0	LRB	3
P-A-G 430	49	60	101	43	51	49	8	0	LRB	2
P-A-G 475	54	63	109	43	50	47	7	0	LRB	2
P-A-G 515	54	62	109	51	55	52	6	0	LRB	2
P-A-G 655	56	63	111	52	55	53	6	0	RB	2
P-A-G 665	64	66	112	45	55	48	5	1	RB	3
Pioneer 820	56	64	113	49	50	46	4	1	LRB	2
Pioneer 828	59	67	111	51	56	60	6	3	RB	3
Pioneer 846	53	60	110	39	52	51	7	0	LRB	3
Pioneer 848	53	62	107	37	45	45	7	0	LRB	3
Pioneer 850	53	63	109	36	53	49	9	0	LRB	3
Pioneer 883	47	54	106	41	46	43	8	1	LRB	3
Pioneer 885	47	57	101	45	51	46	8	2	LRB	2
Taylor Evans Bird-A-Boo	53	59	104	46	41	46	3	0	B	2
Taylor Evans Grainmaster A	40	58	103	48	52	49	7	0	LRB	2
Taylor Evans Mucho	49	58	104	47	51	51	6	0	LRB	2
Taylor Evans 44	46	54	95	54	50	52	4	10	LRB	2

Table 16. Continued

Entry	<u>Days to 50% Bloom</u>		<u>Height in Inches</u>		Head Exsertion In Inches	Per Cent Bird Damage at Maturity	Seed Color at Maturity	Leaf Symptoms 0-5 Scale		
	Yuma	Marana	Snowflake	Yuma					Marana	Snowflake
Taylor Evans 44C	43	51	94	43	48	49	9	10	LRB	2
Taylor Evans 66B	54	61	110	35	44	43	5	0	LRB	3
Taylor Evans 77	67	64	111	40	56	51	6	1	RB	3
Taylor Evans 88	67	66	111	38	53	49	6	0	RB	4
Arkansas 614	53	60	104	40	46	53	5	0	DRB	3
RS 625	49	57	108	44	47	47	7	0	LRB	2
RS 626	49	58	106	43	46	50	8	0	LRB	2
Texas 660	56	61	103	40	50	52	8	1	RB	3

Table 17. Correlations of Yield with Days to Fifty Per Cent Bloom in Some Grain Sorghum Tests for 1969.

Location	Test	Date Test Planted	Correlation Value \bar{r}
Yuma	Early Planted Yield Test	March 22	.77
	USDA Yield Test	May 26	-.12
Marana	Early Maturity Yield Test	June 6	.37
	Mid-Season Maturity Yield Test	June 6	-.16
	Late Maturity Yield Test	June 8	-.25
	USDA Yield Test	June 8	.07
Willcox	Yield Test	May 2	.75

\bar{r} Correlation values are interpreted as from 1.00 as a perfect positive correlation, 0.00 as no correlation and to -1.00 as a perfect negative correlation.

FORAGE SORGHUM

Production trials of some forage sorghums for silage purposes were conducted at two locations in Arizona in 1969 (Mesa and Safford). The yields and other pertinent agronomic information from these two locations are presented in Tables 18 and 19. Table 20 presents average data of those hybrid forages grown at both locations. General adaptation data on many forage sorghum type entries grown under three different environments are presented in Table 21.

Adapted hybrids will produce more dry matter per acre than adapted varieties, thus hybrids are generally recommended. Lodging is a serious problem and seems to vary in degree from one area to another. Some high yielding hybrids and varieties tend to lodge considerably hence they would not be recommended under conditions tending to produce lodging. Lower elevations (higher temperatures) have long growing seasons, tending to produce much growth which consequently tends to lodge. Under these conditions perhaps the selection of earlier maturing sorghums which generally are shorter in height (either hybrid or variety) and the judicious use of fertilizer might help to reduce lodging. It may be necessary to exchange some yield for standing ability in the field.

These results are from test plots with border rows, replicated three times, and seeded at about 12 pounds per acre. Only the center row or rows were harvested for yield at the soft to hard dough stage of development.

Table 18. Agronomic Data From a Single Harvest of Forage Sorghum at Mesa, Arizona 1969.^{1/}

	Yield ^{2/} in Tons/Acre Dry Matter	Yield in Tons/Acre at 30% Dry Matter	Yield in Per Cent of Regular Hegari	Production in Lbs/Acre/Day	Days to 50% Bloom	Days to Harvest	Height at Harvest in Inches
DeKalb FS-26	9.59	31.97	149	646	80	99	109
Pioneer 931	8.85	29.50	137	596	77	99	128
DeKalb FS-24	8.76	29.20	136	679	71	86	91
Funks G-78F	8.56	28.53	133	576	70	99	116
Funks 101F	8.22	27.40	128	637	71	86	90
Acco FS 403-R	8.09	26.97	126	627	67	86	105
DeKalb FS-4	8.07	26.90	125	626	71	86	109
Acco Aztec	7.85	26.17	122	609	72	86	108
Taylor-Evans Yieldmaker A	7.35	24.50	114	570	70	86	89
Pioneer 988	6.79	22.63	105	526	66	86	111
Regular Hegari	6.44	21.47	100	499	65	86	62
Acco FS-401-R	6.43	21.43	100	498	68	86	87

^{1/} Planted in moisture May 6, 1969.

^{2/} Plots = 3 rows (36 inches) x 17 feet. 3 replications.
Plot yield from center row.

Table 19. Agronomic Data From a Single Harvest of Forage Sorghum at Safford, Arizona, 1969. ^{1/}

	Yield ^{2/} in Tons/Acre Dry Matter	Yield in Tons/Acre at 30% Dry Matter	Yield in Per Cent of Regular Hegari	Production in Lbs/Acre/Day	Days to 50% Bloom	Days to Harvest	Height at Harvest in Inches	Per Cent Lodging
Advance 1085 F	16.14	53.80	253	847	114	127	124	3
Rudy Patrick 55	15.63	52.10	245	820	103	127	119	22
Acco Aztec	15.15	50.50	237	795	98	127	109	3
Taylor-Evans Yieldmaker	13.56	45.20	212	712	104	127	110	7
DeKalb FS-26	13.43	44.75	211	705	109	127	121	8
Taylor-Evans Milkmaker	12.75	42.51	200	669	106	127	109	15
Pioneer 931	11.80	39.32	185	619	118	127	156	0
DeKalb FS-24	10.23	34.09	160	537	104	127	89	0
Taylor-Evans Goldmaker	9.84	32.81	154	517	84	127	87	0
Taylor-Evans Yieldmaker A	9.11	30.36	143	478	90	127	82	0
Funks 101 F	8.90	29.68	139	467	93	127	85	0
Acco FS 401-R	7.78	25.92	122	408	94	127	81	0
Funks G-78 F	7.44	24.79	117	468	82	106	116	35
Pioneer 988	7.44	24.79	117	468	76	106	103	30
Advance 1071 F	6.95	23.18	109	437	78	106	97	7
DeKalb FS-4	6.77	22.58	106	426	83	106	94	0
Acco FS-403 R	6.50	21.65	102	408	79	106	88	0
Regular Hegari	6.38	21.25	100	401	80	106	57	0

^{1/} Planted dry May 22, 1969. Irrigated May 23, 1969.

^{2/} Plots = 3 rows (40 inches) x 15 feet. 3 replications.
Harvested 13 feet from center row.

Table 20. Average Yields of Forage Sorghum Hybrids Evaluated at Mesa and Safford, 1969.

Entry	Yield in Tons/acre at 30% Dry Matter			Rankings by Yield		
	Mesa	Safford	Average	Mesa	Safford	Average
	DeKalb FS-26	31.97	44.75	38.36	1	2
Acco Aztec	26.17	50.50	38.34	8	1	2
Pioneer 931	29.50	39.32	34.41	2	3	3
DeKalb FS-24	29.20	34.09	31.64	3	4	4
Funks 101F	27.40	29.68	28.54	5	6	5
Taylor-Evans Yieldmaker A	24.50	30.36	27.43	9	5	6
Funks G-78F	28.53	24.79	26.66	4	8	7
DeKalb FS-4	26.90	22.58	24.74	7	10	8
Acco FS 403-R	26.97	21.65	24.31	6	11	9
Pioneer 988	22.63	24.79	23.71	10	9	10
Acco FS 401-R	21.43	25.92	23.68	12	7	11
Regular Hegari	21.47	21.25	21.36	11	12	12

Table 21. General Adaptation Data of Forage Sorghums Grown at Three Different Locations in Arizona During 1969. 1/2/

Entry	Days to 50% Bloom		Height in Inches		Per Cent Lodging	Head Exertion In Inches	% Bird Damage at Maturity	Seed Color at Maturity ^{3/}		Leaf Symptoms 0-5 Scale ^{4/}
	Yuma	Marana	Snowflake	Yuma				Marana	Snowflake	
Acco Aztec	86	88	106	105	91	89	5	4	LRB	1
Acco 3 Little Indians R	47	60	97	97	92	101	5	5	RB	2
Acco FB 44	56	63	106	93	80	92	5	6	RB	1
Acco FS 401R	74	92	101	88	73	82	5	4	LRB	2
Acco FS 403R	54	64	109	84	78	93	0	4	RB	2
Advance 1071F	65	108	108	34	103	101	0	3		3
Advance 1085F	93	112	112	115	109	105	30	7		3
DeKalb FS-1A	56	78	101	76	73	79	0	4	RB	2
DeKalb FS-4	59	65	109	92	89	105	60	7	DRB	2
DeKalb FS-15	81	94	99	96	89	89	60	6	LRB	1
DeKalb FS-22	70	70	117	105	86	101	15	6	LRB	2
DeKalb FS-24	89	89	108	108	88	76	15	7	LRB	2
DeKalb FS-26	88	111	111	112	92	99	25	6		1
Excel Silo-Fill	90	107	107	82	83	75	5	5		4
Frontier S-214	90	109	109	115	92	95	5	4		1
Funks 78-F	71	65	113	115	110	114	5	5	RB	2
Funks 101-F	86	89	104	85	83	83	10	6	W	1
Funks 102-F	87	87	105	89	75	90	10	4		1
Pioneer 931	107	107	106	136	130	121	45	5		1
Rudy Patrick 55F	89	89	101	120	101	114	90	7		2
Rudy Patrick Sumax	54	63	106	89	78	97	80	4	DRB	2
Taylor Evans Goldmaker	64	66	109	90	84	99	90	3	RB	2
Taylor Evans Milkmaker	84	94	104	115	88	87	80	8		2
Taylor Evans Silo-maker	77	90	105	92	80	82	15	6	LRB	1
Taylor Evans T.D.N.	89	89	107	96	85	77	10	5		
Taylor Evans Yieldmaker	90	90	104	108	105	96	55	6		2
Taylor Evans Yieldmaker A	87	87	103	96	91	86	5	6		1

1/ Location Elevations: Yuma 150 feet; Marana 2,000 feet; Snowflake 5,600 feet.
 2/ Planting Dates: Yuma May 26 (in moisture); Marana June 4 (dry), Irrigated June 8; Snowflake May 16 (in moisture).
 3/ Seed Color: RB = Reddish Brown LRB = Light Reddish Brown DRB = Dark Reddish Brown B = Brown W = White
 4/ Leaf Symptoms: 0 = No symptoms 5 = Severe chlorosis and/or desiccation

SUDANGRASS

Various agronomic data from sudangrass varieties and sorghum x sudangrass hybrids subjected to two cultural practices are given in Tables 22 and 23. Table 22 presents data on sudangrasses and sudangrass type entries when cut frequently to simulate livestock grazing practices. Table 23 presents data on these same entries cut only twice during the season as if for hay purposes.

An average comparison of the ranks of each entry, as evaluated for "grazing" and "hay" production, are presented in Table 24 as an indication of performance under both management practices. An average rank was used to more accurately reflect relative performance under both production practices. If average yields were used a high yielding entry under "hay" could offset a low yield under "grazing" and not reflect a low grazing rank.

Note the reduced total seasonal yield of sudangrass types that have been subjected to multiple harvests over a long season compared to fewer harvests over the same season. It appears that a management practice which reduces the number of times a sudangrass plant is cut back during a season will increase total production for the season.

Note also the reduction in stand at the end of the season of most sorghum x sudangrass type hybrids that have been subjected to a "grazing" regime compared to "hay". This progressive loss of stand with more cuttings can reduce the total seasonal production.

Agronomic data on three sudangrass type entries grown at Snowflake at a high elevation under cool temperatures and a short growing season are given in Table 25.

Table 26 presents general observational data on all sudangrass types evaluated in 1969 under three different environments.

Table 22. Mean Agronomic Performance of Sudangrasses and Sudangrass Type Hybrids Cut Repeatedly to Simulate Frequent Grazing. Mesa, Arizona, 1969^{1/}

Entry	Yield in Tons/Acre of Dry Matter for Cuttings ^{2/}					Total Annual Yield in Tons/Acre at 30% Dry Matter	Per Cent Stand Remaining After Last Cutting	Per Cent Dry Matter of Cuttings At Harvest					Height In Inches of Cuttings				
	June July Aug. Aug. Aug.							1st	2nd	3rd	4th	5th					
	10	1	18	5	29												
Wheeler	.60	1.53	1.36	1.34	2.55	24.91	94	24	21	17	13	22	29	46	40	39	47
California 23	.44	1.22	1.57	1.66	2.46	7.282	92	23	16	15	12	19	25	43	41	42	47
9504A x California 23	.76	1.80	1.65	1.02	1.10	6.326	73	21	15	14	11	19	26	45	37	34	35
Acco HS 33	.70	1.66	1.26	1.05	1.49	6.125	80	22	16	12	11	19	28	44	40	38	38
AZ 290S	.71	1.49	1.22	1.17	1.42	6.010	78	22	16	14	13	19	24	42	36	35	38
Excel Chowmaker	.76	1.12	1.56	.78	1.79	6.009	65	21	15	14	11	22	28	35	40	34	38
DK ST-16	.78	1.20	1.32	.90	1.55	5.741	46	22	15	13	11	23	27	38	38	35	38
DK SX-16	.84	1.22	1.37	.91	1.33	5.673	44	21	14	13	12	25	26	40	37	36	34
Acco SSI	1.01	1.22	1.38	.95	1.10	5.670	62	22	15	14	12	20	30	39	37	34	33
Acco Sweet Sioux	.80	1.28	1.18	.90	1.43	5.590	71	20	14	13	12	20	29	40	37	35	36
DK SX-12	.83	1.23	1.28	.98	1.23	5.543	45	24	15	14	12	20	23	38	35	33	36
Advance 1038G	.85	1.26	1.28	.94	1.20	5.543	65	22	14	14	12	22	27	38	36	31	34
NK Trudan 2	.48	1.13	1.20	1.04	1.68	5.536	71	22	16	14	12	20	24	41	38	38	42
Funks G-78F	.75	1.27	1.41	.87	1.08	5.390	35	23	15	13	12	18	26	38	36	31	32
NK Sweet Sudan	.40	1.15	1.53	1.09	1.23	5.387	69	22	16	14	12	21	19	37	34	33	35
Sweet Sudan	.55	1.11	1.03	1.08	1.51	5.275	84	25	15	14	11	21	21	35	30	34	33
T.E. Haygrazer	.69	1.37	1.25	.86	1.03	5.192	54	23	16	13	11	18	26	40	37	36	36
DK SX-11	.72	1.18	1.18	.75	1.33	5.156	44	22	15	13	11	21	25	39	37	32	35
NK Trudan 4	.47	1.13	1.14	.92	1.47	5.122	68	25	15	13	11	20	20	40	36	34	35
Advance 1041GS	.76	1.12	1.16	.86	1.21	5.120	46	21	14	14	11	22	28	38	38	33	33
Brandes	.30	.93	.98	.79	1.07	4.070	16	25	16	14	13	21	11	30	26	29	32

^{1/} Planted in moisture May 6, 1969.

^{2/} Plots = 4(12 inch) drill rows x 15 feet.

Table 23. Mean Agronomic Performance of Sudangrasses and Sudangrass Hybrids Cut Twice for Hay. Mesa, Arizona. 1969^{1/}

Entry	Yield in Tons/Acre ^{2/} of Dry Matter for ^{2/} Cuttings		Total Annual Yield in Tons/Acre of Dry Matter	Total Annual Yield in Tons/Acre Remaining After Last Cutting	Per Cent Dry Matter of Cuttings at Harvest		Height in Inches of Cuttings		
	July 7 1st	Sept. 4 2nd			1st	2nd	1st	2nd	
Funks G-78F	5.53	8.92	14.44	48.13	62	18	22	90	106
DK SX-16	5.87	7.78	13.79	45.97	56	18	21	87	109
Acco SS1	5.53	9.14	13.37	44.57	81	23	27	94	108
9504A x California 23	5.91	7.03	12.94	43.13	77	20	20	92	105
AX 290S	4.75	8.18	12.94	43.13	76	22	30	94	115
Advance 1038G	4.58	8.34	12.92	43.07	74	24	28	91	112
Acco Sweet Sioux	5.29	7.39	12.68	42.27	81	23	22	93	106
Acco HS 33	4.49	7.91	12.40	41.33	89	25	28	84	98
DK SX-11	4.82	7.53	12.36	41.20	76	19	23	90	111
Excel Chowmaker	5.15	7.06	12.22	40.73	65	18	23	92	106
T. E. Haygrazer	4.60	7.60	12.20	40.67	75	17	22	91	105
Advance 1041 GS	4.70	7.00	11.71	39.03	60	18	24	88	108
DK SX-12	4.86	6.45	11.30	37.67	54	16	25	90	106
DK ST-16	5.23	5.34	10.57	35.23	56	18	21	80	112
Wheeler	4.85	5.28	10.13	33.77	80	33	28	79	99
California 23	3.07	6.60	9.67	32.23	90	23	25	94	108
NK Sweet Sudan	3.28	5.67	8.94	29.80	69	19	23	80	103
Sweet Sudan	2.79	6.10	8.89	29.63	70	19	23	81	107
Brandes	2.84	6.02	8.86	29.53	16	15	26	82	108
NK Trudan 4	3.57	5.02	8.59	28.63	56	20	22	84	100
NK Trudan 2	2.72	5.37	8.09	26.97	59	20	26	87	105

1/ Planted in moisture May 6, 1969.
 2/ Plots = 4(12 inch) drill rows x 15 feet.

Table 24. Yields and Weighted Comparisons by Rank of Numerous Sudangrass Types Evaluated for Production by Grazing and Hay. Mesa, 1969.

Entry	Yield in		Yield in		Grazing Yield Rank	Hay Yield Rank	Average Rank
	Tons/Acre of Dry Matter Grazing ¹ / ₋₋₋	Tons/Acre of Dry Matter Hay ² / ₋₋₋	Tons/Acre of Dry Matter ---	Tons/Acre of Dry Matter ---			
9504A x California 23	6.33	12.94	3	4	3.5		
AZ 290 S	6.01	12.94	5	5	5		
DeKalb SX-16	5.67	13.79	8	2	5		
Acco HS 33	6.12	12.40	4	8	6		
Acco SS 1	5.67	13.37	9	3	6		
Funks G-78F	5.39	14.44	14	1	7.5		
Wheeler	7.47	10.13	1	15	8		
Excel Chowmaker	6.01	12.22	6	10	8		
Acco Sweet Sioux	5.59	12.68	10	7	8.5		
California 23	7.28	9.67	2	16	9		
Advance 1038G	5.54	12.92	12	6	9		
DeKalb ST-16	5.74	10.57	7	14	10.5		
DeKalb SX-12	5.54	11.30	11	13	12		
DeKalb SX-11	5.16	12.36	18	9	13.5		
Taylor Evans Haygrazer	5.19	12.20	17	11	14		
Northrup King Sweet Sudan	5.39	8.94	15	17	16		
Advance 1041 GS	5.12	11.71	20	12	16		
Northrup King Trudan 2	5.54	8.09	13	21	17		
Sweet Sudan	5.28	8.89	16	18	17		
Northrup King Trudan 4	5.12	8.59	19	20	19.5		
Brandes	4.07	8.86	21	19	20		

1/ Grazing - plots cut at 20 to 30 inches of height to simulate grazing. 5 cuttings.

2/ Hay - Plots cut at bloom to soft dough for hay. 2 cuttings.

Table 25. Agronomic Data From a Multiple-Harvest Simulated Grazing Test of Sudangrass Type Hybrids and Varieties at Snowflake, Arizona. 1969^{1/}

Entry	Yield in Tons Per Acre of Dry Matter			Total Season Yield At 20% Dry Matter	Height in Inches at Harvest		
	1st Cutting 16 July	2nd Cutting 19 Aug.	3rd Cutting 19 Sept.		1st Cutting	2nd Cutting	3rd Cutting
Pioneer 985	.558	1.418	.516	2.492	29	52	31
AZ 290S	.347	1.375	.442	2.164	24	53	31
Wheeler	.354	1.026	.428	1.808	31	52	32

1/ Planted May 16, 1969 in moisture.

2/ Plot size = 2 rows (36 inches) x 15 feet, 4 replications. Entries under the same line or lines are considered to be not different in yield at the 5% level of probability.

Table 26. General Adaptation Data of Sudangrass and Sudangrass Type Hybrids Grown at Three Locations in Arizona During 1969. 1/ 2/

Entry	Days to 50% Bloom		Height in Inches		Per Cent Lodging	Head Exsertion In Inches	% Bird Damage at Maturity	Seed Color at Maturity	Leaf Symptoms 0-5 Scale
	Yuma	Marana	Snowflake	Snowflake					
Acco SS1	47	59	97	104	93	121	5	9	1
Acco HS33	53	59	95	95	86	115	0	5	1
Acco Sweet Sioux	56	61	96	95	101	126	5	6	1
Advance 1038G	42	58	91	93	100	124	10	6	1
Advance 1041GS	64	62	112	103	101	121	10	9	2
DeKalb ST-16	64	62	111	103	103	120	5	8	1
DeKalb SX-11	53	61	95	96	106	117	15	9	1
DeKalb SX-12	70	66	109	112	92	109	10	6	1
DeKalb SX-16	64	62	111	105	106	115	15	7	1
Excel Chowmaker	67	65	110	108	100	119	5	4	2
Frontier Hi-dan 35	47	58	94	97	90	117	10	7	2
Funks G-78F	67	65	113	108	100	113	5	6	2
Northrup King Trudan 2	47	59	97	96	95	113	10	6	2
Northrup King Trudan 4	59	70	111	98	94	117	15	4	2
Pioneer 988	53	61	99	102	109	118	5	9	2
Taylor Evans Haygrazer	59	60	111	98	99	121	0	9	2
Frontier G-405X	53	62	112	38	44	45	0	4	3
Funks 2625		89	110	72	73	70	0	5	4
Funks HW 3135	67	63	114	42	50	52	0	7	4
Funks HW 3822	53	61	112	38	48	41	0	8	4
Taylor Evans Exp. 6909S	70	69	119	52	64	47	0	7	4
Taylor Evans 18114	56	63	109	40	52	49	0	7	4
Taylor Evans 20107	56	63	102	41	49	51	0	7	3
Taylor Evans 6913S	70	67	117	54	63	50	0	6	3

1/ Location Elevations: Yuma Elevations: Yuma 150 feet; Marana 2,000 feet; Snowflake 5,600 feet.
 2/ Planting Dates: Yuma May 26 (in moisture); Marana June 4 (dry), Irrigated June 8; Snowflake May 16 (in moisture).
 3/ Seed Color: RB = Reddish Brown LRB = Light Reddish Brown DRB = Dark Reddish Brown B = Brown W = White
 4/ Leaf Symptoms: 0 = No Symptoms 5 = Severe chlorosis and/or dessication.