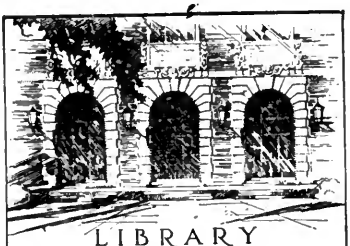

GRAIN AND FORAGE SORGHUMS

1959 Performance in Illinois

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THIS BULLETIN REPORTS the results of Illinois performance tests on sorghums, both grain and forage. The report on grain sorghums begins on page 3 and includes 1959 results and summaries for 1956 through 1959. Forage sorghums, beginning on page 13, include the annual results for 1958 and 1959, as well as summaries.

The tests were conducted at the locations shown on the map at right.

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For general information about grain sorghums for Illinois farmers, see Circular 774, "Grain Sorghums in Illinois."

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GRAIN SORGHUMS

Extensive testing of grain sorghum hybrids and varieties was started in Illinois in 1956. While grain sorghums may not be of great economic importance to Illinois farmers at the present time, the development of new hybrids and new cultural practices make grain sorghum a crop with great potentialities. Being drouth resistant, the crop does well on drouthy, sandy soils and on poorly drained and drouthy claypan soils. Some of the new hybrids compare favorably in yield with corn, even on deep, well-drained soils with a high production potential. Future hybrid combinations may compete directly with corn under conditions favorable for maximum corn production.

Grain sorghum hybrids have consistently outyielded grain sorghum varieties — by 21 percent in 1956, by 26 percent in 1957, by 40 percent in 1958, and in 1959 by 44 percent. The greatest increase, 65 percent, was obtained in Mason county, where the test was grown on dune sand and where moisture was very limiting. Sorghum at this location outyielded corn in the same field by 40 to 50 percent.

The 1959 grain sorghum tests were conducted at five locations (Table 1). Twenty-five commercial hybrids, 9 experiment station hybrids, and 6 standard varieties were tested (Table 2). The tests were supported in part by an entry fee for each commercial entry.

Data from only four of the fields are reported here. The Jackson county trial was ruined by birds and was not harvested for yield.

Detailed results of the 1956, 1957, and 1958 grain sorghum trials were reported in mimeographs AG1738 and AG1785 and in Station Bulletin 643.

Growing Conditions

Growing conditions varied widely from one location to another over the state in 1959. At some locations rainfall was above average while at other locations it was considerably below average (Table 3). Rainfall in Champaign, Mason, and Fayette counties was below average during stand establishment. Good stands were obtained at all locations, however, except for a few entries in the Mason county test. In Pope county rainfall was adequate during stand establishment and was abundant during August and September. These conditions contributed greatly toward yields that were considerably above those for the previous three years. Weather conditions were favorable for harvesting grain sorghum in 1959, and most of the grain could have been stored safely without artificial drying. However, sorghum producers should plan to dry the grain artificially since in many seasons it will not be sufficiently dry to store directly from the field.

Table 1. — GENERAL INFORMATION: Illinois Grain and Forage Sorghum Trials

County	Location	Soil type	Soil production potential	Date planted	Plot size planted[a]	Plot size harvested	Date harvested
Grain Sorghum Trials, 1959							
Champaign	H. J. Schultz and Robert Schultz farm, 5 miles southwest of Champaign	Flanagan silt loam	Very high	June 5	2 rows, each 20′ long	2 rows, each 15′ long	October 9-12
Mason	Julius Frye farm, 2 miles southeast of Havana	Dune sand	Very low	May 28	2 rows, each 20′ long	2 rows, each 12′ long	September 26
Fayette	Brownstown Experiment Field	Hoyleton and Cisne silt loams	Moderately low	June 10	1 row, 50′ long	1 row, 30′ long	October 22
Jackson	Cooperative Agronomy Research Center at Carbondale[b]	Stoy silt loam	Moderately low	June 3	2 rows, each 20′ long	Not harvested for yield because of severe damage by birds	
Pope	Dixon Springs Experiment Station	Sharon silt loam	Low	June 3	2 rows, each 20′ long	1 row, 16½′ long	October 6-7
Forage Sorghum Trials, 1958 and 1959							
DeKalb	Northern Illinois Experiment Field	Flanagan silt loam	Very high	May 14, 1958	3 rows, each 18′ long	1 row, 10′ long	Sept. 30, and Oct. 7, 1958
				May 26, 1959	4 rows, each 15′ long	2 rows, each 10′ long	Sept. 8 and 19, 1959
Champaign	Donald Dean farm, 5 miles northwest of Champaign	Saybrook and Sidell silt loams	Medium	May 12, 1958	3 rows, each 20′ long	1 row, 10′ long	Sept. 4 and 23, 1958
				May 27, 1959	4 rows, each 15′ long	2 rows, each 10′ long	Aug. 25, Sept. 10, 18, and 28, 1959
Jackson	Cooperative Agronomy Research Center at Carbondale[b]	Stoy silt loam	Moderately low	June 9, 1958	2 rows, each 18′ long	2 rows, each 10′ long	Sept. 17-30, 1958
				June 3, 1959	4 rows, each 15′ long	2 rows, each 10′ long	Sept. 15-22, 1959
Pope	Dixon Springs Experiment Station	1958—Grantsburg and Robbs silt loams	Low	June 24, 1958	3 rows, each 25′ long	1 row, 16½′ long	Oct. 20, 1958
		1959—Sharon silt loam	Low	June 4, 1959	4 rows, each 25′ long	1 row, 16½′ long	Sept. 28, 1959—forage component Oct. 8, 1959—grain component

[a] All rows were 40 inches apart.
[b] Southern Illinois University and University of Illinois cooperating.

Table 2. — ENTRIES: 1959 Grain Sorghum Trials

Hybrid or variety	Entered by
Grain sorghum varieties	
Plainsman, Redbine 60, Midland, Reliance, Combine 7078, Norghum	Illinois Agricultural Experiment Station
Grain sorghum hybrids	
Texas 611, Texas 620	Illinois Agricultural Experiment Station (seed furnished by Texas Agricultural Experiment Station—Substation No. 12)
RS 501, RS 661	Illinois Agricultural Experiment Station (seed furnished by Nebraska Agricultural Experiment Station)
RS 590, RS 608, RS 610, RS 650, Texas 660	Illinois Agricultural Experiment Station (seed furnished by Nebraska and Texas Agricultural Experiment Stations)
P.A.G. 425-S, P.A.G. 435-S, P.A.G. 515-S, P.A.G. 605-S, P.A.G. 625-S	Pfister Associated Growers, Inc.
DeKalb C-44a, DeKalb D-50a, DeKalb D-55, DeKalb E-56a, DeKalb F-62a, DeKalb F-63, DeKalb X-49	DeKalb Agricultural Association, Inc.
Frontier 400-C, Frontier 410-C	Frontier Hybrids, Inc.
NK 3000, NK 135, NK 140, NK 210, NK 230	Northrup, King and Company
Steckley GG R-103, Steckley GG R-104-A, Steckley GG R-106, Steckley GG R-108, Steckley GG R-111, Steckley GG R-113	Steckley Hybrid Corn Company

Planting and Harvesting

The experimental design used for the Champaign, Mason, and Pope county trials was a 7×7 semi-balanced lattice square with four replications. In Jackson county a 6×7 rectangular lattice with three replications was used, and in Fayette county a randomized complete block design with two replications was used.

All trials were planted with a hand seeder in 40-inch rows at the calibrated rate of 8 viable seeds per foot. Stands were not thinned. Sorghum heads were harvested by hand. Except at Pope county, heads from each plot were dried artificially to approximately 10 to 12 percent moisture, threshed by a Vogel nursery thresher, and cleaned by a fan. In the trial at Pope county, heads were threshed without artificial drying and averaged 14 percent moisture at harvest.

Results

Data for 1959 and summaries for 1956 through 1959 are presented in Tables 4 through 7. Four-year averages are, of course, more reliable than results for only one year. The fact that an entry does not appear in the summary, however, does not mean it is inferior; its absence merely indicates that it was not tested for all four seasons.

Grain yields. All yields were adjusted to 13 percent moisture and 56 pounds per bushel.

Table 3. — RAINFALL DATA: Weather Stations Near or at Locations of Grain and Forage Sorghum Trials

Weather station location	Year	Precipitation						
		May	June	July	Aug.	Sept.	Oct.	Six-month total
		in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Northern Illinois	1959	2.86	2.38	5.61	3.33	2.40	5.99	22.57
Experiment Field	1958	2.74	6.38	5.69	3.81	1.26	2.39	22.27
(DeKalb county)	Longtime av.	4.09	4.23	3.16	3.61	3.80	2.87	21.76
Urbana (Champaign	1959	6.56	1.09	1.54	2.44	3.36	4.53	19.52
county)	1958	4.29	7.50	7.17	3.27	2.84	.42	25.49
	Longtime av.	4.15	3.85	3.09	3.36	3.27	2.52	20.24
Havana (Mason	1959	3.01	.96	1.14	3.97	2.56	3.72	15.36
county)	1958	1.00	5.68	8.02	1.89	1.91	1.59	20.09
	Longtime av.	3.94	3.92	3.75	3.00	3.98	2.34	20.93
Brownstown Ex-	1959	4.02	.98	1.44	5.97	4.02	2.48	18.91
periment Field	1958	3.25	3.45	10.29	1.57	3.22	1.86	23.64
(Fayette county)	Longtime av.	4.54	4.52	3.05	3.53	3.29	3.02	21.95
Carbondale, Agron-	1959	5.27	2.33	2.34	8.02	5.89	3.19	27.04
omy Research Center	1958	4.34	4.94	10.79	5.09	2.40	1.89	29.45
(Jackson county)	Longtime av.	4.52	4.37	3.10	4.21	4.01	3.67	23.88
Dixon Springs	1959	6.10	2.83	2.30	9.36	8.02	3.18	31.79
Experiment Station	1958	3.55	4.76	14.25	3.21	2.73	1.14	29.64
(Pope county)	Longtime av.	4.06	4.08	3.40	3.48	3.44	3.07	21.53
	Longtime state av.	4.08	3.91	3.25	3.31	3.73	2.54	20.82

Average yields for sorghum hybrids in 1959 at all locations averaged 44 percent above those for the varieties. Corn entries were not included in the grain sorghum performance tests, and therefore no direct comparison of yield of grain sorghum and corn can be made. However, in the Champaign county corn performance test on comparable soil type, corn hybrids averaged 100 bushels per acre, compared with 93 bushels per acre for all grain sorghum hybrids. In Fayette county the corn hybrids averaged 82 bushels and the grain sorghum hybrids averaged 71 bushels per acre. In Mason county the grain sorghum hybrids yielded 38 bushels per acre compared with 25 bushels per acre for corn in the same field. In Pope county the yields were 92 and 83 bushels for grain sorghum hybrids and corn hybrids respectively.

With present cultural practices and hybrids, sorghums are not expected to outyield corn hybrids under conditions favorable for corn. The advantage for sorghum is more likely to be shown on drouthy soils, such as sands and claypans, under conditions when late planting is necessary, perhaps in years of excessive rainfall, and on soils where the fertility level (especially for nitrogen) might limit corn yields.

Silage yields. Grain sorghums can be made into silage but can be expected to yield less than forage sorghums, and stalks of grain sorghums are neither as sweet nor as juicy as those of forage sorghums. The grain sorghums, however, are likely to have a higher grain com-

ponent than the forage sorghums, unless a high-grain-yielding hybrid forage sorghum is used. For the past four years at Dixon Springs, grain sorghums averaged 10.5 tons of silage per acre, while forage sorghums averaged 15.4 tons and corn averaged 14.0 tons. Silage yields from grain sorghums were exceptionally high in 1959, averaging 13.0 tons per acre with some hybrids yielding 17 to 19 tons. The 13.0 tons of silage made from grain sorghum contained an average of 72 bushels of grain, while the 19.4 tons of silage made from forage sorghum at Dixon Springs contained an average of only 25 bushels of grain.

Maturity. A good indication of relative maturity of the different entries is the number of days to bloom, considered to be when 50 percent of each head of the majority of heads has flowered.

In Champaign county in 1959 the average number of days to bloom of the hybrids was 64 compared with 62 for the varieties. There was a difference of 18 days between the earliest and the latest entry. NK 3000 bloomed in 52 days while DeKalb F-63, P.A.G. 625-S, and Steckley GG R-113 required 70 or 71 days. Dry weather in Champaign and Mason counties reduced yields of the early entries more than yields of the medium- and late-maturing entries. In central and southern Illinois, medium- and late-maturing varieties should be grown because of their greater yields.

Test weight. The test weight, or pounds per bushel, is one of the quality factors used in determining the grade that is assigned in commercial marketing of grain. Entries in these trials did not differ greatly in this characteristic.

Head exsertion. Head exsertion is the distance from the top leaf (flag leaf) to the base of the head. Sorghums with heads that are well exserted are more easily harvested because less plant material passes through the combine.

Head exsertion of most hybrids averaged about 6 inches while head exsertion of the varieties was slightly less.

Head length. Head-length measurements were taken in the Champaign and Fayette county tests and averaged 8 and 7 inches, respectively. Differences were very small, and there was no apparent association of head length and other characters.

Lodging. Plants were considered lodged when they inclined more than 45 degrees. In the 1959 trials, lodging was rare. Since no important differences among entries were observed, the data are not reported here.

Height. Height is measured from the ground level to the top of the plant. Shorter varieties and hybrids are easier to combine. In the 1959 trials in Champaign county, entries ranged from 39 to 54 inches

in height; in Mason county from 30 to 48 inches; in Pope county from 46 to 68 inches; and in Fayette county from 31 to 51 inches.

Number of heads per plot. The heads were counted only from that part of the plot which was harvested. This information provides a rough estimate of stand since but little tillering or secondary head production was observed in 1959. If it is assumed that each head was from a separate plant, then, based on the planting rate of 8 viable seeds per foot, the percent of emergence was 65 percent for the Champaign field, 61 percent for the Mason field, and 63 percent for the Fayette field. This resulted in a plant population of about 5 plants per foot, or 66,000 plants per acre.

Seedling vigor. The lack of seedling vigor is one of the criticisms of grain sorghum, and more attention should be given to this characteristic. The hybrids exhibited considerably more seedling vigor than the varieties, and there was much variation among hybrids.

Head type. Heads of sorghum hybrids and varieties varied from being compact to open or loose. Open-headed types were formerly thought to dry more rapidly than compact types. Experimental results here and at other experiment stations indicate that this is not necessarily true.

Uniformity. In Fayette county, the entries were rated for uniformity and were found to be quite variable. There was no apparent association between uniformity and yield.

Interpreting Yield Differences in the Tables

Entries are ranked in the order of yield, but it should be remembered that small differences do not necessarily indicate that one hybrid or variety is inherently superior to another. Interpretation of the data and comparison of the entries may be made more meaningful by use of the "difference necessary for significance" appearing at the bottom of each table. These differences have been computed by the "Multiple Range Test."[1] To compare the yield of two entries, all entries must be listed in order of their performance (as they appear in the tables). To determine the number in the range, count the entries being compared plus the number between these two and use the corresponding difference necessary for significance. For characters other than yield, only the difference for more than 20 in the range has been computed. This difference can be safely used to compare any two entries even though they are not listed in order for a particular character.

[1] Duncan, D. B., "Multiple Range and Multiple F Tests." Biometrics 11, (1):1-43. 1955.

Table 4. — GRAIN SORGHUMS: East-Central Ill., Champaign County

Rank in yield	Hybrid or variety	Yield at 13% moisture	Test weight	Number of heads per plot	Seedling vigor on June 29[a]	Plant height	Head exsertion	Head length	Days to bloom	Head type[b]
		bu/acre	*lb.*		*rating*	*in.*	*in.*	*in.*		*rating*
	1959 RESULTS									
1	DeKalb D-50a	115	55	130	2.6	53	6	9	60	5
2	DeKalb F-63	110	56	164	3.7	50	7	10	70	3
3	Texas 620	107	57	154	3.2	49	7	9	65	2
4	P.A.G. 515-S	107	55	174	3.0	48	7	8	66	3
5	Frontier 400-C	104	55	154	3.4	46	6	8	62	2
6	RS 610	101	55	166	3.0	47	7	8	62	2
7	DeKalb F-62a	101	55	158	4.1	47	6	10	66	5
8	Steckley GG R-104-A	100	58	168	3.9	48	7	9	68	4
9	Texas 660	99	55	158	3.4	46	6	9	66	2
10	RS 661	99	56	154	3.6	46	7	9	66	3
11	Steckley GG R-106	97	55	142	3.2	46	6	9	66	3
12	NK 140	96	54	173	3.4	48	8	7	61	3
13	Steckley GG R-111	96	54	138	3.8	46	6	9	67	3
14	RS 590	94	55	156	3.6	46	6	9	63	2
15	Texas 611	93	57	123	4.1	46	5	9	65	2
16	NK 210	93	55	177	3.8	49	7	7	62	2
17	Steckley GG R-103	92	56	169	3.2	49	6	8	59	3
18	DeKalb E-56a	91	54	142	3.7	46	5	9	65	5
19	Frontier 410-C	91	53	156	5.1	43	5	8	69	1
20	Steckley GG R-108	89	56	147	3.5	43	5	8	66	2
21	NK 230	89	56	184	3.0	44	7	8	64	2
22	RS 650	88	55	178	2.8	42	5	8	65	1
23	RS 608	88	54	174	3.2	44	7	8	62	3
24	P.A.G. 435-S	88	53	161	4.0	43	7	8	63	3
25	Plainsman	88	50	176	3.7	40	4	8	68	1
26	P.A.G. 425-S	87	56	191	2.6	45	7	7	62	4
27	NK 135	87	56	180	3.7	52	8	10	55	5
28	DeKalb C-44a	84	53	110	5.0	44	5	9	62	5
29	Redbine 60	80	55	115	4.8	46	5	10	67	3
30	RS 501	80	53	192	3.1	54	7	8	57	3
31	Combine 7078	76	52	170	3.8	38	5	8	64	2
32	NK 3000	72	53	169	2.4	42	7	8	52	5
33	DeKalb X-49	70	52	147	3.6	46	6	9	62	5
34	Midland	66	56	145	5.5	48	5	7	65	3
35	Reliance	60	55	188	4.7	45	5	6	56	5
36	Norghum	29	52	132	4.7	39	5	8	54	5
	Av. all sorghums	88	55	159	3.7	46	6	8	63	3
	Av. 30 sorghum hybrids	93	55	160	3.4	46	6	8	63	3
	Av. 6 sorghum varieties	66	53	154	4.5	43	5	8	62	3
	Number in range			Difference necessary for significance						
	2	10								
	3-5	11								
	6-10	12								
	11-20	12								
	Over 20	12	3	34	1.4	2	1	1	3	1

SUMMARY: 1956-1959 or 1957-1959 AVERAGES

		(1956-1959)	(1956-1959)	(1956-1959)	(1957-1959)	(1957-1959)
1	DeKalb D-50a	114	58	63	9	67
2	Texas 620	109	58	59	7	69
3	RS 610	109	57	57	8	68
4	Texas 660	103	57	57	7	70
5	Texas 611	100	58	57	6	68
6	DeKalb E-56a	100	57	56	7	70
7	RS 590	98	58	56	7	68
8	RS 650	98	57	52	6	70
9	RS 501	96	57	66	8	62
10	Redbine 60	87	57	55	6	70
11	Combine 7078	80	54	45	5	71
12	Plainsman	78	54	48	6	73
13	Midland	73	57	55	6	70
14	Reliance	56	56	52	7	61
	Av. 9 sorghum hybrids	103	57	58	7	68
	Av. 5 sorghum varieties	75	56	51	6	69
	Number in range			Difference necessary for significance		
	2	11				
	3-5	13				
	6-10	13				
	Over 10	14	2	4	2	3

[a] Seedling vigor ratings are on a scale from 1 (most vigorous) to 9 (least vigorous).
[b] Head type ratings are on a scale from 1 (compact) to 5 (open).

Table 5. — GRAIN SORGHUMS: Central Illinois, Mason County

Rank in yield	Hybrid or variety	Yield at 13% moisture	Test weight	Number of heads per plot	Seedling vigor on June 20[a]	Plant height
		bu/acre	*lb.*		*rating*	*in.*
	1959 RESULTS					
1	NK 230	50	57	132	1.7	42
2	P.A.G. 515-S	50	53	116	2.3	34
3	Steckley GG R-108	50	56	102	3.3	33
4	P.A.G. 435-S	44	50	121	2.3	34
5	Texas 620	43	53	135	2.7	44
6	DeKalb D-50a	43	51	109	2.7	43
7	NK 210	42	50	131	3.0	48
8	Steckley GG R-106	42	50	136	2.7	39
9	RS 590	41	56	116	2.7	39
10	RS 650	41	52	134	2.4	36
11	RS 608	40	51	138	2.8	35
12	P.A.G. 425-S	40	53	131	3.3	34
13	DeKalb E-56a	39	53	115	3.3	38
14	NK 140	39	55	128	2.7	43
15	Steckley GG R-111	38	52	101	3.7	38
16	RS 610	38	52	117	3.6	44
17	Texas 660	38	53	115	3.4	40
18	DeKalb F-62a	37	52	124	3.7	37
19	RS 661	37	54	135	2.3	35
20	Steckley GG R-103	35	49	127	2.7	40
21	Steckley GG R-113	34	53	80	3.7	34
22	Texas 611	32	52	113	4.0	45
23	Plainsman	32	50	122	4.0	33
24	DeKalb F-63	30	53	99	3.3	40
25	Steckley GG R-104-A	30	55	121	3.7	42
26	NK 3000	28	48	117	1.7	41
27	DeKalb X-49	28	49	112	4.0	40
28	NK 135	27	50	116	2.7	47
29	DeKalb C-44a	25	48	88	3.0	32
30	Redbine 60	23	53	99	5.0	33
31	Combine 7078	21	52	91	4.3	30
32	Reliance	15	51	119	4.7	36
	Av. all sorghums	36	52	115	3.2	38
	Av. 28 sorghum hybrids	38	52	118	3.0	39
	Av. 4 sorghum varieties	23	52	108	4.5	33
	Number in range	Difference necessary for significance				
	2	11				
	3-5	12				
	6-10	13				
	11-20	13				
	Over 20	13	5	32	1.8	
	SUMMARY: 1958-1959 AVERAGES					
1	NK 230	51	58			44
2	DeKalb D-50a	42	54			46
3	RS 650	48	55			39
4	Texas 620	47	56			44
5	RS 590	46	56			44
6	P.A.G. 515-S	45	56			40
7	RS 610	45	55			46
8	P.A.G. 425-S	44	56			38
9	P.A.G. 435-S	42	54			33
10	RS 608	41	54			40
11	DeKalb E-56a	40	56			44
12	NK 140	36	58			45
13	Texas 660	36	56			44
14	Texas 611	36	52			46
15	NK 3000	36	54			44
16	Plainsman	30	54			37
17	NK 135	30	53			50
18	DeKalb C-44a	30	54			38
19	Combine 7078	28	54			31
20	Redbine 60	24	55			38
	Av. 17 sorghum hybrids	41	55			46
	Av. 3 sorghum varieties	27	54			35
	Number in range	Difference necessary for significance				
	2	11				
	3-5	12				
	6-10	13				
	Over 10	13	N.S.			7

NOTE: "N.S." indicates differences are not great enough to be statistically significant.
[a] Seedling vigor ratings are on a scale from 1 (most vigorous) to 9 (least vigorous).

Table 6. — GRAIN SORGHUMS: South-Central Illinois, Fayette County

Rank in yield	Hybrid or variety	Yield at 13% moisture	Test weight	Number of heads per plot	Plant height	Head exsertion	Head length	Uniformity[a]
		bu/acre	*lb.*		*in.*	*in.*	*in.*	*rating*
	1959 RESULTS							
1	P.A.G. 605-S	90	58	155	46	6	8	3
2	Redbine 60	89	58	94	43	4	9	3
3	DeKalb D-50a	86	59	142	50	7	9	4
4	P.A.G. 515-S	82	56	140	48	6	8	2
5	DeKalb X-49	80	58	120	44	5	9	3
6	Steckley GG R-106	79	58	120	45	6	7	3
7	P.A.G. 625-S	78	58	117	45	5	7	3
8	Steckley GG R-104-A	75	58	176	47	8	8	1
9	DeKalb F-62a	75	56	126	48	6	8	2
10	DeKalb C-44a	74	56	133	42	4	8	3
11	Steckley GG R-103	74	59	151	42	5	7	4
12	Texas 660	73	58	173	43	6	8	3
13	DeKalb D-55	72	57	139	47	6	8	3
14	DeKalb E-56a	72	58	144	46	6	8	2
15	Frontier 400-C	72	56	130	42	5	7	4
16	RS 661	71	58	140	47	8	7	2
17	NK 230	71	56	180	45	6	7	3
18	Texas 620	71	58	122	47	6	9	2
19	Steckley GG R-113	71	58	68	47	4	7	3
20	RS 590	70	58	165	43	5	8	3
21	DeKalb F-63	69	57	146	51	7	7	2
22	NK 210	69	58	182	46	6	6	3
23	Plainsman	68	57	158	39	6	7	3
24	RS 650	67	59	178	44	6	6	3
25	Texas 611	67	56	176	48	7	8	4
26	Steckley GG R-108	66	58	129	43	7	6	2
27	RS 608	66	58	212	42	8	6	3
28	NK 135	65	58	203	38	4	7	4
29	Frontier 410-C	65	58	160	44	7	6	2
30	NK 140	64	56	186	42	8	6	4
31	NK 3000	63	56	150	38	3	8	5
32	RS 610	63	58	206	44	6	6	4
33	P.A.G. 435-S	60	56	154	42	7	6	3
34	Steckley GG R-111	60	56	100	46	4	9	3
35	P.A.G. 425-S	58	56	168	41	8	6	3
36	Midland	49	57	175	43	5	6	4
37	Combine 7078	49	56	110	34	4	6	3
38	Norghum	38	56	183	31	0	7	3
39	Reliance	35	56	194	38	4	6	2
	Av. all sorghums	68	57	151	44	6	7	3
	Av. 33 sorghum hybrids	71	57	151	45	6	7	3
	Av. 6 sorghum varieties	55	57	132	38	4	7	3
	Number in range		Difference necessary for significance					
	2	11						
	3-5	12						
	6-10	13						
	11-20	13						
	Over 20	13	N.S.	48				

NOTE: "N.S." indicates differences are not great enough to be statistically significant.
[a] Uniformity ratings are on a scale from 1 (most uniform) to 5 (least uniform).

Table 7. — GRAIN SORGHUMS: Southern Illinois, Pope County

Rank in yield	Hybrid or variety	Yield at 13% moisture	Grain moisture at harvest	Grain, plants per rod	Silage at 70% moisture	Dry matter of silage at time of harvest	Silage, plants per rod	Plant height	Head exsertion
		bu/acre	*perct.*		*T/acre*	*perct.*		*in.*	*in.*
	1959 RESULTS								
1	Frontier 400-C	107	15	65	14.4	30	65	55	5
2	NK 140	107	16	82	15.2	33	79	58	6
3	NK 210	104	14	76	17.4	36	76	60	6
4	P.A.G. 425-S	104	14	80	12.2	35	62	51	5
5	DeKalb D-50a	103	15	57	15.9	33	60	68	6
6	RS 610	101	15	76	13.7	31	74	57	6
7	Texas 660	99	14	76	12.9	28	70	56	7
8	DeKalb D-55	99	14	62	12.6	31	63	57	5
9	P.A.G. 515-S	98	16	73	18.8	40	77	60	8
10	RS 650	97	14	86	12.9	30	90	56	5
11	DeKalb F-62a	97	15	73	16.2	37	68	56	5
12	RS 590	96	15	73	12.9	28	72	57	6
13	RS 608	94	15	80	14.0	32	74	54	7
14	RS 501	94	16	67	14.1	30	68	66	6
15	DeKalb F-63	93	15	68	13.2	27	60	60	7
16	Frontier 410-C	91	14	83	12.9	29	96	54	7
17	NK 230	89	15	84	13.2	32	86	54	8
18	Texas 620	87	16	73	15.6	33	78	61	7
19	RS 661	87	14	86	12.6	28	89	57	8
20	DeKalb C-44a	85	14	60	13.6	34	55	54	5
21	P.A.G. 605-S	82	14	78	16.4	29	87	58	8
22	Texas 611	82	16	71	16.1	34	75	56	5
23	DeKalb X-49	81	13	81	12.5	31	88	56	6
24	Steckley GG R-108	80	14	56	12.1	32	62	51	5
25	DeKalb E-56a	78	14	66	11.1	28	76	53	6
26	Combine 7078	77	14	63	11.7	34	64	46	4
27	Steckley GG R-113	77	15	57	13.9	33	59	56	6
28	P.A.G. 625-S	77	15	61	14.0	32	63	52	5
29	Steckley GG R-111	75	14	64	11.8	28	55	54	5
30	Norghum	68	14	71	8.7	30	76	51	4
31	Redbine 60	67	13	59	9.9	27	61	54	5
32	Reliance	66	14	82	10.4	26	92	54	5
33	Midland	61	14	67	13.0	29	69	57	5
34	Plainsman	59	12	78	11.8	31	83	45	6
	Av. all sorghums	87	14	72	13.5	31	73	56	6
	Av. 28 sorghum hybrids	92	15	72	14.0	31	73	57	6
	Av. 6 sorghum varieties	66	14	70	10.9	30	74	51	5
	Number in range			Difference necessary for significance					
	2	17			3.3				
	3-5	19			3.7				
	6-10	20			4.0				
	10-20	21			4.1				
	Over 20	21	2	16	4.2	8	17	6	3
	SUMMARY: 1956-1959 AVERAGES								
1	RS 610	78			12.1			56	
2	DeKalb D-50a	72			12.6			64	
3	RS 650	66			10.6			52	
4	RS 501	64			11.4			63	
5	RS 590	59			11.6			56	
6	Texas 620	59			12.1			58	
7	Combine 7078	55			9.2			44	
8	Texas 611	53			11.6			57	
9	Redbine 60	48			9.6			53	
10	Plainsman	48			10.0			45	
11	Midland	42			10.6			54	
12	Reliance	36			7.2			53	
	Av. 7 sorghum hybrids	64			11.7			58	
	Av. 5 sorghum varieties	46			9.3			50	
	Number in range			Difference necessary for significance					
	2	12			2.3				
	3-5	14			2.5				
	6-12	14			2.7			3	

FORAGE SORGHUMS

Forage sorghum performance tests were conducted at five widely separated locations in Illinois in 1956 and 1957 and at four locations in 1958 and 1959. General information concerning the locations of the 1958 and 1959 trials is presented in Table 1. Results of the 1956 and 1957 tests were reported in mimeograph AG1798 of the Department of Agronomy. The present bulletin presents data for the 1958 and 1959 tests, as well as three- and four-year summaries when they are available. The fact that an entry does not appear in the summary does not mean that it is inferior; its absence merely indicates that it was not tested for all seasons.

In the 1958 tests, 11 hybrids were compared with 6 to 11 varieties and 3 corn hybrids at each location, and in 1959, 8 to 13 hybrids were compared with 9 or 10 varieties and 3 corn hybrids (Table 8).

The silage yields of forage sorghum hybrids have averaged about the same as yields of forage sorghum varieties during the four years that tests have been conducted in Illinois. The average yield of corn silage per acre has been considerably less than that of forage sorghum. The corn entries, however, usually yield more grain per acre than the forage sorghum entries. Several of the forage hybrids have a definite advantage over the varieties in grain production and compare favorably with corn in this respect.

Growing Conditions

Growing conditions for 1959 have been discussed previously in this bulletin, and rainfall data for each location are presented in Table 3. In 1958 an abundance of moisture provided generally favorable conditions for corn but not always for the sorghums. Temperatures below normal and excessive moisture in Champaign county apparently reduced emergence and caused slow establishment. In DeKalb county moisture was limiting at the time of planting, emergence was slow, and the sorghums were slow in becoming established. Many entries had not reached the recommended stage of maturity for making silage by October 1, 1958, the time of the first frost.

Planting and Harvesting

The experimental design used in both 1958 and 1959 for the forage sorghum trials was a 5×5 semi-balanced lattice square with three replications, except in Jackson county in 1958 where a randomized block design with four replications was used.

All sorghum plots were planted with a hand seeder in 40-inch rows at the calibrated rate of 8 to 10 seeds per foot. Stands were not thinned except for the corn entries, which were thinned to approximately 20,000 plants per acre. Only those portions of the rows with adequate and uniform stands were harvested for yield. Whenever possible, varieties and hybrids were harvested when the grain was in the hard-dough stage. In most trials the grain component was measured by cutting off all heads of the harvested silage sample after it was used to determine the silage yield. The heads were then placed in a burlap bag, dried, and threshed by a Vogel nursery thresher. Several entries did not reach the hard-dough stage of maturity before frost and consequently gave low grain yields.

Table 8. — ENTRIES: 1958 and 1959 Forage Sorghum Trials

Hybrid or variety	Entered by
1958 TRIALS	
Forage sorghum varieties	
Tracy, Leoti Red, Sourless Orange, Sourless White, Orange Fodder Cane, Kansas Orange, Ellis, Atlas, Norkan, Hegari, Sumac 1712	Illinois Agricultural Experiment Station
Forage sorghum hybrids	
RS 301F, RS 303F	Illinois Agricultural Experiment Station (seed furnished by Nebraska Agricultural Experiment Station)
DeKalb FS-1, DeKalb Exp. A, DeKalb Exp. B, DeKalb Exp. C	DeKalb Agricultural Association, Inc.
Asgrow Beef Builder, Asgrow Silo King	Asgrow Texas Company
NK 145, NK 300, NK 320	Northrup, King and Company
Corn hybrids	
U.S. 13, Ill. 1332, AES 702, Ill. 1864, Ill. 1277, AES 805, Ill. 1851	Illinois Agricultural Experiment Station
1959 TRIALS	
Forage sorghum varieties	
Norkan, Tracy, Sart, Wiley, Atlas, Sourless Orange, Honey Sorgo (Texas), Hegari, Kansas Orange, Ellis	Illinois Agricultural Experiment Station
Forage sorghum hybrids	
DeKalb FS-1a, DeKalb FS-22, DeKalb SX-11	DeKalb Agricultural Association, Inc.
Frontier S-210	Frontier Hybrids, Inc.
NK 145, NK 300, NK 3059, NK 3065	Northrup, King and Company
Steckley GG 300	Steckley Hybrid Corn Company
RS 301F	Illinois Agricultural Experiment Station (seed furnished by Nebraska Agricultural Experiment Station)
Texas A605 x R6645 Texas A605 x R1306 Texas A605 x R7210	Illinois Agricultural Experiment Station (seed furnished by Texas Agricultural Experiment Station—Substation No. 12)
Corn hybrids	
U.S. 13, Ill. 1332, Spanish Sweet, AES 702, Ill. 1279, Ill. 1864, Ill. 1851, Ill. 1570, AES 805	Illinois Agricultural Experiment Station

Results

Data for 1958 are presented in Tables 9, 11, 13, and 15. Data for 1959 with three- and four-year summaries are presented in Tables 10, 12, 14, and 16.

Silage yields. All silage yields, including corn, were adjusted to 70 percent moisture. In 1958 the forage sorghum hybrids yielded slightly higher on the average than the forage sorghum varieties, and in 1959 the reverse was true. The forage sorghums have consistently outyielded corn in silage per acre. The advantage of sorghums over corn is more apparent when conditions are less favorable for corn. For example, in Champaign county in 1959, a midsummer drouth reduced yield of both corn and sorghum considerably, yet the best forage sorghum yield was almost double that of the best corn hybrid.

Grain yields. The grain yield of corn greatly exceeded the average yield of the forage sorghums in 1958 except in Pope county, where the yield of both corn and sorghums was very low. In the Pope county trials in 1959, with ample moisture, the corn had a much greater grain yield than the forage sorghums. The extremely low corn yields in the 1959 forage sorghum trials in Champaign and DeKalb counties were probably a result of the corn plots being surrounded by tall-growing sorghums, which may have prevented normal pollination and seed set. The grain component of the forage sorghums grown in Jackson county was not harvested for yield in 1959 because of severe damage by birds.

The forage sorghum hybrids and varieties varied widely in grain yield, the 1959 yields ranging from 1 to 74 bushels per acre. Many of the hybrids produced considerably more grain than the standard varieties.

Test weight. The test weight, or pounds per bushel, is one of the quality factors used in determining the grade that is assigned in commercial marketing of grain. The entries were quite variable in this characteristic. Test weight of forage sorghums is partly a reflection of maturity and condition of the grain at time of harvest as well as of the physical characteristics of the grain. Varieties which have glumes that do not separate from the kernels during threshing can be expected to have a lower test weight than other varieties.

Plant height. Plant height which was taken near harvest time was measured from the ground level to the top of the plant. Plant heights in 1958 ranged from 62 to 118 inches in DeKalb county, from 73 to 141 in Champaign county, from 83 to 144 in Jackson county, and from 63 to 104 in Pope county. In 1959 the respective ranges were 75 to 130 inches, 64 to 113, 65 to 129, and 87 to 152. Some of the tallest entries are also among the best in standability.

Maturity. A good indicator of relative maturity of forage sorghums is the number of days to bloom. The number of days to bloom is presented for the trials in Champaign and Jackson counties. In DeKalb county a relative maturity rating was given for each entry. In 1958 the difference between the earliest and the latest sorghum in both central and southern Illinois was about 25 days. In 1959 the difference was 37 to 40 days. NK 145 and DeKalb SX-11 were in full bloom 62 to 64 days after planting in Champaign county, while Tracy, Sart, Honey Sorgo, and DeKalb FS-22 required 104 to 113 days. Several hybrids mature sufficiently early to be harvested before frost, even in extreme northern Illinois.

Lodging. One of the primary requirements of a desirable forage-type sorghum for Illinois is that it should stand well. The percent of lodging varied considerably among entries and among locations. The sorghum varieties lodged less on the average than the hybrids. Certain hybrids and varieties have very good standability.

Male-fertility restoration. In Champaign county in 1959, ten heads of each variety were bagged to check for male sterility. All plants that were checked had either normal seed set or no seed at all. Frontier S-210, RS 301F, and Steckley GG 300 had ten heads, each 100 percent sterile. NK 145 had four heads that were 100 percent sterile, but the other six heads were normal. Hybrids that are partly or completely male-sterile are marketed with about 5 percent of the seed being pollinator seed, which furnishes sufficient pollen in the field for normal seed production.

Interpreting Differences in the Tables

The same procedure for interpreting differences is used as explained previously for the grain sorghum. The entries are ranked according to yield of silage per acre. The difference necessary for significance is listed at the bottom of each column.

Table 9. — FORAGE SORGHUMS: Northern Illinois, DeKalb County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Grain at 13% moisture	Test weight	Maturity on Oct. 7[a]	Plant height	Lodging
		T/acre	*perct.*	*bu/acre*	*lb.*	*rating*	*in.*	*perct.*
	1958 RESULTS							
1	DeKalb Exp. A	29.9	24	..	..	7.0	118	8
2	RS 301F	21.3	30	48	54	8.9	89	7
3	DeKalb Exp. B	21.0	25	..	..	7.0	112	5
4	Asgrow Beef Builder	20.5	31	58	55	8.8	92	86
5	Asgrow Silo King	20.1	26	..	..	7.0	111	7
6	Kansas Orange	20.0	27	..	..	7.8	99	6
7	DeKalb Exp. C	19.9	22	..	..	5.5	117	1
8	NK 145	18.4	31	73	59	10.0	92	14
9	Orange Fodder Cane	18.3	25	..	..	7.3	104	7
10	Corn (AES 702)	18.1	34	90	56	...	90	29
11	Tracy	17.8	22	..	..	5.6	107	0
12	Sourless Orange	17.4	20	..	..	6.0	100	1
13	Norkan	17.1	31	51	58	8.8	91	2
14	Sumac 1712	16.3	19	..	..	5.0	91	1
15	RS 303F	16.2	28	31	56	7.7	93	6
16	NK 320	16.1	31	79	56	10.0	80	96
17	Atlas	16.0	23	..	..	7.0	97	1
18	Corn (Ill. 1864)	15.7	36	87	54	...	88	48
19	NK 300	15.5	32	56	53	9.2	65	85
20	DeKalb FS-1	15.3	29	57	54	9.2	68	84
21	Leoti Red	15.1	28	..	..	7.5	98	8
22	Ellis	14.9	26	..	..	8.3	92	0
23	Corn (Ill. 1277)	13.1	33	80	54	...	88	50
24	Hegari	10.4	30	57	52	10.0	62	95
	Av. all sorghums	18.1	27	56	55	7.7	94	24
	Av. 11 sorghum hybrids	19.8	28	57	55	8.2	94	36
	Av. 10 sorghum varieties	16.3	25	54	55	7.2	94	11
	Av. 3 corn hybrids	15.6	34	86	55	...	89	42
	Number in range			Difference necessary for significance				
	2	5.1		17				
	3-5	5.6		19				
	6-10	5.9		20				
	11-24	6.0	6	20	2	.8	8	14

SUMMARY: 1956-1958 or 1957-1958 AVERAGES

		(1956-1958)	(1957-1958)	(1957-1958)
1	Kansas Orange	21.9	107	6
2	Sumac 1712	21.1	96	3
3	RS 301F	20.4	94	6
4	Tracy	19.9	104	4
5	Corn	19.6	92	32
6	Sourless Orange	18.5	97	6
7	Atlas	18.0	98	4
8	Norkan	17.3	94	4
9	DeKalb FS-1	16.9	79	70
10	Ellis	15.6	99	2
	Number in range		Difference necessary for significance	
	2	3.2		
	3-5	3.6		
	6-10	3.7	16	18

[a] Maturity ratings are on a scale of 5 = full bloom, 7 = milk stage, 8 = soft dough, 9 = hard dough, and 10 = mature seed.

Table 10. — FORAGE SORGHUMS: Northern Illinois, DeKalb County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Grain at 13% moisture	Test weight	Maturity on Sept. 8[a]	Plant height	Lodging
		T/acre	*perct.*	*bu/acre*	*lb.*	*rating*	*in.*	*perct.*
	1959 RESULTS							
1	Tracy	28.0	26	2	42	6.0	128	17
2	Honey Sorgo (Texas)	28.0	25	22	38	7.0	128	36
3	Kansas Orange	27.9	32	42	53	7.6	113	7
4	Sart	27.2	28	26	50	7.0	130	26
5	DeKalb FS-22	23.2	26	4	49	7.3	116	41
6	Frontier S-210	23.0	30	12	48	8.4	106	5
7	Sourless Orange	22.8	26	11	50	5.8	97	1
8	NK 3065	22.6	31	56	51	8.1	97	53
9	Steckley GG 300	22.2	27	1	..	8.5	105	5
10	Atlas	22.2	28	28	52	7.8	104	7
11	Wiley	22.1	25	2	44	5.4	128	13
12	NK 3059	21.6	32	64	51	8.3	97	17
13	RS 301F	21.4	28	26	52	8.6	96	4
14	NK 300	21.0	32	68	53	8.9	82	10
15	DeKalb SX-11	20.8	38	43	45	9.4	105	10
16	Norkan	20.8	29	26	51	8.8	104	6
17	Corn (AES 702)	20.4	36	30[b]	54	9.0	100	7
18	Ellis	19.6	32	24	53	8.6	97	0
19	Hegari	19.1	30	68	51	8.6	75	5
20	DeKalb FS-1a	18.9	30	64	50	8.8	85	0
21	NK 145	18.6	30	70	52	9.0	104	29
22	Texas A605 x R7210	18.4	30	46	46	8.8	95	47
23	Corn (Ill. 1279)	18.4	36	36[b]	56	9.5	98	8
24	Corn (Ill. 1864)	17.8	35	21[b]	55	9.2	100	4
	Av. all sorghums	22.4	31	33	49	7.8	104	16
	Av. 11 sorghum hybrids	21.1	30	41	50	8.3	99	20
	Av. 10 sorghum varieties	23.8	31	25	48	7.3	110	12
	Av. 3 corn hybrids	18.9	36	29[b]	54	9.2	99	6
	Number in range	Difference necessary for significance						
	2	4.7		18				
	3-5	5.2		19				
	6-10	5.4		20				
	11-24	5.6	5	21	9	.6	7	30

	SUMMARY: 1956-1959 or 1957-1959 AVERAGES							
		(1956-1959)		(1957-1959)			(1957-1959)	(1957-1959)
1	Kansas Orange	23.4		..			109	6
2	Tracy	21.9		..			112	8
3	RS 301F	20.6		35			94	5
4	Sourless Orange	19.6		..			97	4
5	Corn	19.4		..			94	23
6	Atlas	19.0		..			100	5
7	Norkan	18.2		34			97	4
8	DeKalb FS-1a	17.4		54			81	50
9	Ellis	16.6		..			98	2
	Number in range	Difference necessary for significance						
	2	2.8						
	3-5	3.1						
	6-9	3.2					12	38

[a] Maturity ratings are on a scale of 5 = full bloom, 7 = milk stage, 8 = soft dough, 9 = hard dough, and 10 = mature seed.

[b] Corn grain yields did not appear to be representative since corn plots were surrounded by sorghum. Corn yields at a comparable population in a corn trial in DeKalb county averaged 98 bushels per acre when harvested for grain at a much later date.

Table 11. — FORAGE SORGHUMS: East-Central Illinois, Champaign County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Grain at 13% moisture	Test weight	Days to bloom	Plant height	Lodging
		T/acre	*perct.*	*bu/acre*	*lb.*		*in.*	*perct.*
	1958 RESULTS							
1	Asgrow Beef Builder	29.0	29	72	49	94	113	28
2	DeKalb Exp. B	28.3	32	36	56	101	140	13
3	Tracy	28.2	28	15	49	109	136	11
4	DeKalb Exp. C	27.9	29	29	54	107	141	6
5	Leoti Red	27.5	30	35	42	94	124	22
6	Sourless Orange	27.0	29	27	54	106	108	64
7	Asgrow Silo King	26.1	31	46	57	98	123	20
8	DeKalb Exp. A	25.8	29	26	55	103	140	15
9	Sourless White	25.6	30	44	58	99	108	3
10	Corn (U.S. 13)	24.5	51	123	56	..	108	2
11	Orange Fodder Cane	24.5	30	50	56	96	112	21
12	Kansas Orange	24.3	30	39	56	98	120	40
13	NK 320	24.1	32	78	55	89	96	57
14	RS 301F	23.1	28	45	52	94	106	3
15	Ellis	22.8	32	45	53	92	106	43
16	Corn (Ill. 1332)	22.7	53	126	56	..	108	0
17	RS 303F	22.5	32	41	57	95	110	4
18	NK 145	22.3	34	68	52	84	112	55
19	NK 300	22.1	32	60	51	91	74	5
20	DeKalb FS-1	21.7	30	70	45	92	87	30
21	Sumac 1712	21.6	29	37	52	91	97	1
22	Atlas	21.4	30	46	59	96	116	32
23	Corn (AES 702)	19.7	53	120	57	..	105	2
24	Norkan	17.9	32	49	58	92	94	13
25	Hegari	14.6	37	57	49	88	73	30
	Av. all sorghums	24.2	30	46	53	96	110	23
	Av. 11 sorghum hybrids	24.8	30	52	53	95	113	21
	Av. 11 sorghum varieties	23.6	31	40	53	96	108	25
	Av. 3 corn hybrids	22.3	52	123	56	..	107	1
	Number in range			Difference necessary for significance				
	2	7.0		18				
	3-5	7.7		21				
	6-10	8.1		22				
	11-25	8.3	7	22	5	3	9	32
	SUMMARY: 1956-1958 AVERAGES							
1	Tracy	27.0					124	13
2	Kansas Orange	25.2					116	24
3	Sourless Orange	22.3					103	28
4	DeKalb FS-1	22.2					89	12
5	Atlas	22.1					109	7
6	Sumac 1712	21.8					102	36
7	RS 301F	20.6					100	20
8	Norkan	19.3					92	5
9	Corn	19.2					111	37
10	Ellis	19.1					101	5
	Number in range			Difference necessary for significance				
	2	4.4						
	3-5	4.9						
	6-10	5.1					12	N.S.

NOTE: "N.S." indicates differences are not great enough to be statistically significant.

Table 12. — FORAGE SORGHUMS: East-Central Illinois, Champaign County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Grain at 13% moisture	Test weight	Seedling vigor on June 29[a]	Days to bloom	Plant height	Lodging
		T/acre	*perct.*	*bu/acre*	*lb.*	*rating*		*in.*	*perct.*
	1959 RESULTS								
1	Tracy	19.8	30	22	52	5.7	89	113	0
2	DeKalb FS-22	18.6	32	44	55	3.3	83	104	4
3	Wiley	17.1	31	14	43	4.8	99	94	22
4	Sourless Orange	17.0	33	44	56	5.8	90	86	0
5	RS 301F	16.8	34	62	54	3.3	73	79	2
6	Sart	16.6	31	24	52	6.0	92	109	0
7	Frontier S-210	16.4	34	39	52	3.8	78	89	0
8	Kansas Orange	16.4	34	40	54	4.5	81	97	0
9	Texas A605 x R6645	16.2	32	48	50	3.7	81	77	1
10	Hegari	16.2	37	56	53	4.5	77	64	0
11	DeKalb FS-1a	15.8	38	58	53	2.8	77	71	1
12	NK 3065	15.7	36	64	47	3.8	83	88	13
13	NK 300	15.4	36	60	51	2.7	78	71	0
14	Honey Sorgo (Texas)	15.4	28	19	41	5.8	89	106	18
15	Atlas	15.3	32	37	54	4.8	83	88	0
16	Steckley GG 300	14.9	36	40	55	4.2	79	85	0
17	NK 3059	14.8	36	51	47	3.2	84	78	8
18	Texas A605 x R1306	14.8	38	52	45	3.2	82	84	29
19	Texas A605 x R7210	13.4	40	52	52	2.5	67	74	44
20	Norkan	13.0	34	47	55	5.3	72	83	0
21	DeKalb SX-11	12.6	35	22	41	2.7	64	93	0
22	NK 145	12.0	38	42	52	3.8	62	74	0
23	Corn (Ill. 1332)	10.6	35	28[b]	55	...	..	82	0
24	Corn (U.S. 13)	9.5	34	29[b]	55	...	..	85	0
25	Corn (Spanish Sweet)	8.8	29	8[b]	48	...	..	76	0
	Av. all sorghums	15.6	34	43	51	4.1	80	87	6
	Av. 13 sorghum hybrids	15.2	36	49	50	3.3	76	82	8
	Av. 9 sorghum varieties	16.3	32	34	51	5.2	86	93	4
	Av. 3 corn hybrids	9.6	33	22[b]	53	...	..	81	0
	Number in range			Difference necessary for significance					
	2	3.6		17					
	3-5	4.0		18					
	6-10	4.2		19					
	11-25	4.3	4	20	5	1.3	4	9	16

		(1956-1959)	(1957-1959)	(1958-1959)	(1956-1959)	(1956-1959)
	SUMMARY: 1956-1959, 1957-1959, or 1958-1959 AVERAGES					
1	Tracy	25.2	17	99	121	5
2	Kansas Orange	23.0	44	90	111	18
3	Sourless Orange	21.0	31	98	99	27
4	DeKalb FS-1a	20.6	59	84	84	28
5	Atlas	20.4	42	90	104	10
6	RS 301F	19.7	51	84	95	4
7	Norkan	17.7	44	82	90	9
8	Corn	16.8	78	..	104	4
	Number in range		Difference necessary for significance			
	2	3.5				
	3-5	3.8				
	6-8	4.0	40	7	10	27

[a] Seedling vigor ratings are on a scale from 1 (most vigorous) to 9 (least vigorous).

[b] Corn grain yields did not appear to be representative since corn plots were surrounded by sorghums. Corn yields at a comparable population at a more desirable location in Champaign county averaged 89 bushels per acre when harvested for grain at a much later date.

Table 13. — FORAGE SORGHUMS: Southern Illinois, Jackson County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Grain at 13% moisture	Test weight	Days to bloom	Plant height	Lodging
		T/acre	*perct.*	*bu/acre*	*lb.*		*in.*	*perct.*
	1958 RESULTS							
1	Asgrow Beef Builder	22.6	23	15	43	94	120	46
2	DeKalb Exp. A	21.0	26	2	..	87	140	0
3	NK 320	20.4	25	37	52	89	144	81
4	Corn (AES 805)	20.2	37	81	59	..	..	..
5	Kansas Orange	19.4	27	29	54	83	126	22
6	Orange Fodder Cane	18.9	27	35	55	79	128	4
7	Corn (Ill. 1851)	18.8	35	71	57	..	..	..
8	DeKalb Exp. B	18.0	27	3	..	81	142	0
9	DeKalb FS-1	17.8	27	9	44	84	116	10
10	RS 301F	17.7	27	37	50	76	106	0
11	Corn (Ill. 1332)	17.6	40	81	58	..	..	..
12	DeKalb Exp. C	17.5	26	2	..	90	136	1
13	NK 300	17.4	23	33	47	93	104	6
14	NK 145	17.1	32	73	61	70	94	2
15	Asgrow Silo King	17.0	27	50	53	78	120	25
16	Atlas	16.3	25	3	..	82	126	0
17	RS 303F	15.7	26	4	42	76	122	0
18	Hegari	14.8	28	59	52	75	83	1
19	Leoti Red	14.5	27	22	48	76	108	89
20	Norkan	14.0	28	4	43	78	101	0
	Av. all sorghums	17.7	27	24	49	82	118	13
	Av. 11 sorghum hybrids	18.4	26	24	49	83	122	10
	Av. 6 sorghum varieties	16.3	27	25	50	79	112	19
	Av. 3 corn hybrids	18.9	38	78	58	..	..	..
	Number in range			Difference necessary for significance				
	2	4.1		17				
	3-5	4.5		19				
	6-10	4.8		20				
	11-20	5.0	4	21	5	3	13	28
	SUMMARY: 1956-1958 AVERAGES							
1	Kansas Orange	20.3		40			112	21
2	RS 301F	19.1		49			100	2
3	Atlas	17.8		18			108	0
4	Corn	16.9		71			..	..
5	DeKalb FS-1	16.4		34			93	19
6	Norkan	15.2		26			93	0
	Number in range			Difference necessary for significance				
	2	N.S.						
	3-6	N.S.		22			14	25

NOTE: "N.S." indicates differences are not great enough to be statistically significant.

Table 14. — FORAGE SORGHUMS: Southern Illinois, Jackson County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Days to bloom	Days to maturity	Plant height	Lodging
		T/acre	*perct.*			*in.*	*perct.*
	1959 RESULTS						
1	Sart	21.6	26	104	132	129	29
2	DeKalb FS-22	21.0	31	86	103	105	35
3	Tracy	20.4	31	92	109	116	12
4	Wiley	20.1	28	104	135	129	78
5	Atlas	20.0	35	84	101	82	8
6	Sourless Orange	19.6	31	90	109	87	3
7	Steckley GG 300	19.4	32	81	101	86	7
8	NK 3065	19.3	35	86	105	87	1
9	Texas A605 x R6645	19.1	34	83	100	73	0
10	NK 3059	19.0	32	84	102	80	0
11	Honey Sorgo (Texas)	18.2	24	102	119	121	76
12	NK 300	17.9	32	82	103	71	2
13	RS 301F	16.6	31	78	100	81	2
14	Frontier S-210	16.5	30	82	97	93	31
15	Corn (Ill. 1851)	16.2	37	..	..	81	8
16	Kansas Orange	16.1	31	84	105	86	34
17	Texas A605 x R7210	15.4	32	74	97	66	0
18	DeKalb FS-1a	14.9	32	79	97	70	5
19	Hegari	14.8	33	83	102	65	2
20	Norkan	14.1	32	79	97	75	5
21	Corn (AES 805)	14.0	36	..	..	76	8
22	DeKalb SX-11	13.8	35	71	93	91	27
23	Corn (Ill. 1570)	13.0	38	..	..	77	4
24	Ellis	12.2	32	79	97	79	16
	Av. all sorghums	17.6	32	86	105	90	18
	Av. 11 sorghum hybrids	17.6	33	80	100	82	10
	Av. 10 sorghum varieties	17.7	30	90	111	97	26
	Av. 3 corn hybrids	14.4	37	..	..	78	7
	Number in range			Difference necessary for significance			
	2	3.9					
	3-5	4.3					
	6-10	4.5					
	11-24	4.7	7	4	14	11	29
	SUMMARY: 1956-1959 or 1958-1959 AVERAGES						
		(1956-1959)		(1958-1959)		(1956-1959)	(1956-1959)
1	Kansas Orange	19.2		84		106	24
2	RS 301F	18.5		77		95	2
3	Atlas	18.3		83		102	2
4	Corn	16.3		..		..	..
5	DeKalb FS-1a	16.0		82		87	16
6	Norkan	15.0		78		89	2
	Number in range			Difference necessary for significance			
	2	2.9					
	3-6	3.2		N.S.		10	19

NOTE: "N.S." indicates differences are not great enough to be statistically significant.

Table 15. — FORAGE SORGHUMS: Southern Illinois, Pope County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Silage, plants per rod	Grain at 13% moisture	Grain, plants per rod	Plant height	Weight of heads
		T/acre	*perct.*		*bu/acre*		*in.*	*lb/acre*
	1958 RESULTS							
1	Asgrow Beef Builder	10.1	28	50	6	44	104	705
2	Kansas Orange	9.9	28	62	8	53	88	655
3	Asgrow Silo King	9.3	27	72	22	60	89	1528
4	DeKalb FS-1	9.0	30	51	18	44	79	1554
5	RS 303F	8.7	31	57	11	46	82	741
6	RS 301F	8.4	30	70	20	57	80	1081
7	DeKalb Exp. B	8.4	30	36	12	38	93	968
8	Orange Fodder Cane	8.2	27	73	4	56	84	436
9	DeKalb Exp. A	7.7	29	42	5	33	97	507
10	NK 300	7.7	29	78	7	56	70	966
11	Atlas	7.5	28	37	8	40	81	650
12	NK 320	7.2	26	75	4	50	80	582
13	DeKalb Exp. C	6.5	30	28	8	24	99	720
14	Leoti Red	6.4	23	39	5	43	97	488
15	Hegari	6.4	34	46	26	48	63	1652
16	NK 145	6.0	30	77	23	57	84	1768
17	Norkan	6.0	31	44	6	34	76	588
18	Corn (AES 805)	5.3	34	22	10	23	80	595
19	Corn (Ill. 1851)	5.0	33	22	12	18	81	682
20	Corn (Ill. 1332)	4.4	39	22	6	21	76	367
	Av. all sorghums	7.8	29	55	12	46	85	917
	Av. 11 sorghum hybrids	8.1	29	58	12	46	87	1011
	Av. 6 sorghum varieties	7.4	28	50	13	46	82	744
	Av. 3 corn hybrids	4.9	35	22	9	21	79	548
	Number in range		Difference necessary for significance					
	2	2.8			9			
	3-5	3.1			10			
	6-10	3.2			10			
	11-20	3.3	6	19	10	15	12	751
	SUMMARY: 1956-1958 AVERAGES							
1	DeKalb FS-1	15.3			76			
2	Kansas Orange	14.8			100			
3	RS 301F	14.1			92			
4	Atlas	13.0			97			
5	Corn	11.4			95			
6	Norkan	11.0			86			
	Number in range		Difference necessary for significance					
	2	N.S.						
	3-6	N.S.			15			

NOTE: "N.S." indicates differences are not great enough to be statistically significant.

Table 16. — FORAGE SORGHUMS: Southern Illinois, Pope County

Rank in silage yield	Hybrid or variety	Silage at 70% moisture	Dry matter of silage at harvest	Silage, plants per rod	Grain at 13% moisture	Grain moisture at harvest	Grain, plants per rod	Plant height	Lodging
		T/acre	*perct.*		*bu/acre*	*perct.*		*in.*	*perct.*
	1959 RESULTS								
1	Sart	25.6	26	51	9	16	48	152	1
2	NK 3065	24.1	29	58	31	21	53	122	54
3	Corn (Ill. 1851)	22.5	46	25	94	25	20	123	7
4	Steckley GG 300	20.9	25	60	1	17	48	126	23
5	Hegari	20.7	33	73	61	15	54	87	14
6	Honey Sorgo (Texas)	20.7	18	69	8	21	54	138	100
7	DeKalb FS-22	20.6	24	72	9	16	56	133	85
8	Atlas	20.4	25	62	10	15	43	123	23
9	NK 300	20.2	27	74	74	17	66	107	100
10	Sourless Orange	20.1	23	89	16	24	78	120	62
11	NK 3059	20.0	22	58	44	19	45	120	82
12	DeKalb FS-1a	20.0	25	71	50	15	61	107	72
13	RS 301F	19.8	26	92	18	14	73	113	53
14	Tracy	19.4	24	62	6	18	54	143	44
15	Kansas Orange	19.4	24	78	24	20	68	134	54
16	DeKalb SX-11	18.2	27	96	33	14	75	131	80
17	Corn (AES 805)	17.2	40	27	82	24	24	115	1
18	Ellis	16.3	26	78	15	14	53	114	12
19	Norkan	15.8	28	42	28	14	45	107	27
20	Corn (Ill. 1570)	14.9	46	25	72	22	24	115	10
21	Wiley	12.6	18	114	5	19	76	138	94
	Av. all sorghums	19.7	25	72	25	17	58	123	54
	Av. 8 sorghum hybrids	20.5	25	73	32	17	60	120	69
	Av. 10 sorghum varieties	19.1	24	72	18	18	57	126	43
	Av. 3 corn hybrids	18.2	44	26	83	24	23	118	6
	Number in range				Difference necessary for significance				
	2	5.9			16				
	3-5	6.5			18				
	6-10	6.8			18				
	11-21	7.0	8	19	19	5	15	18	44
	SUMMARY: 1956-1959 AVERAGES								
		(1956-1959)			(1956-1959)			(1956-1959)	(1956-1959)
1	DeKalb FS-1a	16.4			41			84	18
2	Kansas Orange	16.0			..			108	14
3	RS 301F	15.5			42			97	17
4	Atlas	14.8			..			103	6
5	Corn	13.1			60			101	2
6	Norkan	12.2			27			91	7
	Number in range				Difference necessary for significance				
	2	2.6							
	3-6	2.9						11	N.S.

NOTE: "N.S." indicates differences are not great enough to be statistically significant.

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