NAME OF TEST: Seed yield and quality of warm season grasses, 1960.

OBJECTIVES: (1) To determine when to harvest seed of grasses which mature seed unevenly, over a long period or which shatter badly. (2) To study the influence of time of harvest on total yield and seed quality. (3) To determine potential yields and the relationship of the above factors to season.

EXPERIMENTAL PROCEDURE:

Location: Agronomy Farm, College Station, Texas

Soil type: Lufkin fine sandy loam

Cultural practices: The grasses were established in 1956 and fertilized at various rates in 1957 and 1958. The grasses were in cultivated rows and were fertilized with 42-42-42 following the spring seed crop. Irrigation was used as necessary to maintain moisture.

Grasses: Kleingrass (Panicum coloratum), Setaria sphacelata, Pretoria 90 bluestem (Andropogon annulatus) and Medio bluestem (Andropogon nodosus).

Yield determinations: Replicated 10-foot single row plots of Klein, Setaria, and Pretoria 90 were harvested at frequent intervals following the first seed shattering and continuing as long as seed were available on the inflorescences. The seed were dried, threshed, cleaned and weighed and caryopsis determinations made either by dehulling and weighing or by individual florets counts. Various combinations of irrigation, no irrigation and rates of nitrogen were applied to Medio and Pretoria 90 bluestem in early October in an effort to stimulate fall seed production.

RESULTS: See tables.

DISCUSSION: Kleingrass yields were poor in 1960. The best yield and quality of seed were obtained immediately after obvious seed shattering occurred. Seed quality in the late summer crop gradually declined in quality until the end of August. Apparently a second crop of seed was produced even though the plants had not been cut back and seed yield and quality improved in early September for about 5 days.

Good yields of Setaria were obtained in July. Both yield and quality improved several days after initial maturity in both July and September. Since Setaria seed shatter very rapidly, this evidently resulted from late inflorescence production.

Pretoria 90 yields were satisfactory but seed set was nil.

Fall treatments of nitrogen and irrigation stimulated vegetative growth of Medio and Pretoria 90 but not flowering. These plants frequently boot in late fall but fail to emerge in time to mature before frost. Further work on fall seed production is needed.

PROJECT: Hatch 1259

DATE SUBMITTED: March 1961

AUTHOR: F. C. Holt

Seed yield and quality of three warm season grasses harvested at intervals following initial seed maturity, Agronomy Farm, College Station, 1960.

Date	Pounds of seed material per acre	Pounds of pure seed per acre	% Seed set (by weight)
	Kleingrass		
June 15	39	3.4	8.7
June 17	18	2.6	14.4
June 22	21	3.4	16.2
Aug. 9	55	16.3	29.6
Aug. 15	44	11.1	25.2
Aug. 18	54	11.2	20.7
Aug. 22	36	5.9	16.4
Aug. 26	47	5.7	12.7
Aug. 29	39	4.7	12.1
Aug. 31	26	1.8	6.9
Sept. 2	25	4.1	16.4
Sept. 5	41	6.4	15.6
Sept. 7	34	4.7	13.8
Sept. 9	36	3.0	8.3
Sept. 14	25	2.2	8.8
	Setaria sphacelata		
June 27	53	8.9	16.8
July 1	50	7.1	14.2
July 11	62	4.6	6.6
July 20	101	36.0	35.6
July 22	71	31.0	44.3
Sept. 2	13	4.3	33.1
Sept. 5	13	5.7	43.8
Sept. 7	10	2.2	22.0
Sept. 9	22	4.7	21.4
Sept. 14	29	8.7	30.0

	Pretoria 90 bluestem		
Date	Yield	% Caryopsis No/100 florets	Wt. 100 florets (grams)
June 15	98	2.7	.031
June 17	109	4.0	.027
June 22	60	2.3	.023
June 27	49	3.3	.029

NAME OF TEST: Seed production characteristics of Smooth bromegrass, Bromus inermis.

OBJECTIVE: To determine the influence of environment on the flowering and seed maturation characteristics of selected clones of brome. This is part of a study of the influence of climate on genetic shift in synthetic varieties of forage plants. The clones were selected for similar behavior under one environment.

EXPERIMENT PROCEDURE:

Location: Brazos River Valley Lab near College Station, Texas

Soil type: Miller clay

Cultural practices: Individual clones were established in 40-inch rows, 3 feet apart in the row, 5 plant plots, 20 replications in March, 1958. The plants were irrigated as necessary to insure survival and cultivated regularly.

Data: Seed were collected in the spring of 1959 and again in 1960. Plant height, number of culms per plant, seed yield, seed quality and seed weight were determined.

RESULTS: See tables.

DISCUSSION: Two clones of Wisconsin brome 55-4 and 55-15, were poor seeders in general. They were low in culm number, seed yield, percent fertility and seed unit weight. Clone 55-10 was low in culm number and seed yield but had satisfactory fertility and seed unit weight. The clones were quite uniform for number of spikelets per panicle and number of florets per spikelet.

Saratoga brome clones 46-11 and 46-92 were low in seed yield and percent fertility. Clone 46-157 was the lowest in seed yield and culm number but had satisfactory fertility. Clone 46-157 also had the fewest number of spikelets per panicle and florets per spikelet indicating a small panicle. The weight of 100 seed units (florets) was fairly uniform and not as closely related to % fertility as might be expected.

The average seed yield, % fertility and seed weight of Saratoga brome was higher than Wisconsin brome.

PROJECT: Hatch 1258

DATE SUBMITTED: February, 1961

WORKER: E. C. Holt

Seed production and seeding characteristics of individual smooth bromegrass clones near College Station, 1960.

Clone	gms. of seed (total 3 plants)	no. culms per plant	no. spikelets per panicle	no florets per spikelet	% fertility	wt. of 100 florets (grams)
			Wisconsin brome			
55-4 (2T)	10	23	31	4.0	13.36	.114
55-7 (2U)	73	119	34	7.4	32.64	.230
55-10 (2W)	11	41	29	3.1	34.38	.180
55-15 (2X)	21	53	29	3.8	16.28	.147
55-16 (2Y)	47	112	34	4.8	40.11	.189
			Saratoga brome			
46-11 (E)	43	76	27	5.5	15.73	.208
49-16 (F)	117	182	32	4.6	52.81	.271
46-92 (G)	40	138	43	2.5	20.86	.283
46-157 (H)	29	80	19	2.6	45.62	.237
46-166 (J)	132	302	21	3.5	54.81	.279

WISCONSIN BROMEGRASS

Clone	Plot	Total grams of seed plant 2,3,4	Culms/plant Avg. 2,3,4	Spikelets per panicle	Spikelets at center node	Florets at center node	Florets per spikelet	Total no. seed at center node	Avg. no. seed per spikelet	% Fertility	Plot	Grams of seed plants 2,3,4	Weight of 100 florets (grams) Plots	Wt.
55-4 2T	3	13	59	39	7	30	4.3	6.2	.89	20.69	52	5	3	.131
	10	5	29	36	7	40	5.7	7.5	1.07	18.77	60	1	10	.115
	15	6	22	29	6	19	3.2	.8	.13	4.06	63	1	15	.108
	20	1	9	17	4	12	3.0	.0	0	0	66	6	20	.103
	22	1	4								72	6		
	30	6	36	41	6	22	3.7	2.0	.33	8.91	77	52		
	35	5	26	25	5	21	4.2	3.5	.70	16.66	81	16		
	37	6	42	34	8	30	3.8	8.8	1.10	28.94	88	11		
	41	10		37	9	40	4.4	5.0	.56	12.72	92	11		
	46	10		24	5	19	3.8	1.8	.36	9.47	96	18		
Average		6	23	31	6	26	4.0	4.0	.57	13.36		13		.114
55-7 2U	2	120	79	46	5	34	6.8	10.3	2.06	38.23	51	39	2	.190
	7	33	38	55	10	80	8.0	15.5	1.55	19.37	57	18	7	.223
	13	51	140	25	4	40	10.0	12.3	3.08	30.80	61	23	13	.251
	17	56	168	37	6	52	8.7	14.5	2.42	27.81	67	68	17	.254
	25	48	109	24	6	40	6.7	10.2	1.70	25.37	73	67		
	26	81	167	23	4	30	7.5	9.3	2.33	31.06	76	71		
	31	80	129	28	5	48	9.6	15.0	3.00	31.25	84	150		
	40	54	125	31	5	26	5.2	7.7	1.54	29.61	86	59		
	42	109		43	7	32	4.6	17.2	2.46	53.47	95	133		
	48	114		31	5	35	7.0	13.8	2.76	39.42	97	73		
Average		75	119	34	6	42	7.4	12.6	2.29	32.64		70		.230
55-10 2W	1	2	22	23	5	17	3.4	9.0	1.80	52.94	53	4	1	.136
	6	2	7	30	7	20	2.9	7.3	1.04	35.86	59	1	6	.184
	12	4	16	25	7	25	3.6	4.0	.57	15.83	62	12	12	.207
	16	4	27	21	5	15	3.0	2.5	.50	16.66	68	4	16	.193
	24	2	20	21	5	10	2.0	2.0	.40	20.00	74	7		

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Wisconsin Bromegrass Continued

	27	9	29	31	6	24	4.0	9.8	1.63	40.75	78	21		
	32	--	176	33	8	26	3.3	10.5	1.31	39.69	83	34		
	39	11	29	36	8	26	3.3	11.3	1.41	42.72	87	18		
	43	16		36	6	17	2.8	7.8	1.30	46.42	91	36		
	50	1		31	8	19	2.4	6.3	.79	32.91	99	28		
Average		5	41	29	7	20	3.1	7.1	1.08	34.38		17		.180
55-15 2X	4	44	127	31	6	28	4.7	6.5	1.08	22.97	55	10	4	.173
	9	20	77	28	7	24	3.4	2.0	.29	8.52	58	3	9	.131
	14	15	81	27	5	19	3.8	2.1	.42	11.05	64	8	14	.143
	18	6	32	28	6	24	4.0	2.3	.38	9.50	69	10	18	.142
	23	3	28	16	4	9	2.3	1.0	.25	10.86	75	19		
	28	6	25	32	8	32	4.0	2.5	.31	7.75	79	23		
	34	7	47	30	6	26	4.3	5.3	.88	20.46	82	29		
	36	3	7	32	7	29	4.1	9.3	1.33	32.43	89	36		
	45	18		32	6	20	3.3	3.3	.55	16.66	93	109		
	47	31		29	6	26	4.3	5.8	.97	22.55	100	17		
Average		15	53	29	6	24	3.8	4.0	.65	16.28		26		.147
55-16 2Y	5	72	101	40	8	52	6.5	19.2	2.40	36.92	54	53	5	.212
	8	65	111	33	7	30	4.3	7.8	1.11	25.81	56	21	8	.177
	11	51	86								65	48	11	.198
	19	8	52	28	6	24	4.0	8.7	1.45	36.25	70	36	19	.169
	21	27	97	11	3	8	2.7	2.3	.77	28.51	71	40		
	29	75	149	39	8	41	5.1	21.3	2.66	52.15	80	58		
	33	57	135	35	8	42	5.3	20.3	2.54	47.92	85	58		
	38	62	162	37	7	42	6.0	18.2	2.60	43.33	90	46		
	44	18		42	9	42	4.6	16.0	1.78	38.69	94	69		
	49	31		37	7	35	5.0	18.0	2.57	57.40	98	37		
		47	112	34	7	35	4.8	14.6	1.99	40.11		47		.189

SARATOGA BROMEGRASS

Clone	Plot	Total grams of seed plant 2,3,4	Culms/plant Avg. 2,3,4	Spikelets per panicle	Spikelets at center node	Florets at center node	Florets per spikelet	Total no. seed at center node	Avg. no. seed per spikelet	% Fertility	Plot	Grams of seed plants 2,3,4	Weight of 100 florets (grams) Plots	Wt.
46-11 E	3	39	80	32	10	32	3.2	6.0	.60	18.75	52	54	3	.197
	10	27	49	20	5	22	4.4	2.3	.46	10.45	60	30	10	.233
	15	42	84	33	8	40	5.0	6.0	.75	15.00	63	38	15	.209
	20	27	58	27	6	28	4.7	1.8	.30	6.38	66	43	20	.194
	22	33	50	30	7	37	5.3	11.0	1.57	29.62	72	69		
	30	34	84	27	6	30	5.0	3.8	.63	12.60	77	38		
	35	81	138	32	7	49	7.0	9.7	1.38	19.71	81	36		
	37	43	62	26	7	46	6.6	6.8	.97	14.69	88	48		
	41	25		21	4	27	6.8	3.8	.95	13.97	92	53		
	46	39		22	4	29	7.3	4.7	1.18	16.16	96	46		
Average		39	76	27	6	35	5.5	5.6	.88	15.73		46		.208
46-19 F	2	51	105	34	9	34	3.8	12.3	1.37	36.05	51	105	2	.262
	7	158	251	34	7	32	4.6	21.3	3.04	66.08	57	124	7	.257
	13	140	188	35	7	34	4.9	20.2	2.89	58.97	61	136	13	.283
	17	78	129	23	5	24	4.8	14.3	2.86	59.58	67	167	17	.280
	25	80	192	29	7	30	4.3	16.5	2.36	54.88	73	190		
	26	159	144	30	7	25	3.6	15.2	2.17	60.27	76	150		
	31	144	239	39	8	39	4.9	24.3	3.04	62.04	84	120		
	40	10	210	31	7	35	5.0	10.7	1.53	30.60	86	150		
	42	87		28	4	20	5.0	9.8	2.45	49.00	95	111		
	48	144		40	6	28	4.7	14.3	2.38	50.63	97	27		
Average		105	182	32	7	30	4.6	15.9	2.41	52.81		128		.271
46-92 G	1	30	93	48	10	18	1.8	4.8	.48	26.66	53	43	1	.267
	6	51	158	58	13	25	1.9	4.0	.31	16.31	59	30	6	.212
	12	82	167	53	9	21	2.3	3.8	.42	18.26	62	27	12	.344
	16	47	133	41	6	13	2.2	.2	.03	1.36	68	20	16	.310
	24	46	199	41	7	17	2.4	1.7	.24	10.00	74	30		

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Saratoga Bromegrass Continued

	27	62	90	18	4	9	2.3	5.8	1.45	63.04	78	30		
	32	30	153	53	8	30	3.8	10.7	1.34	35.26	83	36		
	39	26	114	32	5	9	1.8	0	0	0	87	17		
	43	25		50	7	24	3.4	7.0	1.00	29.41	91	71		
	50	32		34	5	13	2.6	1.1	.22	8.46	99	62		
Average		43	138	43	7	18	2.5	3.9	.56	20.86		37		.283
46-157 H	4	22	73	24	8	14	1.8	3.0	.38	21.11	55	37	4	.225
	9	36	89	15	5	5	1.0	1.8	.36	36.00	58	26	9	.276
	14	22	70	35	6	15	2.5	2.5	.42	16.80	64	--	14	.249
	18	38	120	18	6	16	2.7	8.0	1.33	49.25	69	32	18	.197
	23	37	99	18	5	15	3.0	6.8	1.36	45.33	75	23		
	28	54	55	19	5	13	2.6	8.5	1.70	65.38	79	27		
	34	36	92	13	3	10	3.3	5.3	1.77	53.63	82	28		
	36	11	41	14	4	13	3.3	9.2	2.30	69.69	89	26		
	45	26		19	4	10	2.3	6.2	1.55	67.39	93	20		
	47	32		18	4	12	3.0	3.8	.95	31.66	100	20		
Average		31	80	19	5	12	2.6	5.5	1.21	45.62		27		.237
46-166 J	5	110	220	24	8	22	2.8	14.0	1.75	62.50	54	108	5	.289
	8	151	281	22	5	16	3.2	10.2	2.04	63.75	56	124	8	.268
	11	130	264	18	4	13	3.3	8.2	2.05	62.12	65	192	11	.310
	19	145	332	21	4	14	3.5	6.0	1.50	42.85	70	127	19	.247
	21	158	355	26	5	19	3.8	10.2	2.04	53.68	71	101		
	29	180	360	17	5	22	4.5	11.7	2.34	52.00	80	90		
	33	140	322	18	4	13	3.3	6.7	1.68	50.90	85	96		
	38	147	283	25	7	27	3.9	15.0	2.14	54.87	90	106		
	44	87		21	4	12	3.0	6.8	1.70	56.66	94	140		
	49	147		19	4	16	4.0	7.8	1.95	48.75	98	158		
Average		140	302	21	5	17	3.5	9.7	1.92	54.81		124		.279

NAME OF TEST: Seed production characteristics of White clover synthetic varieties

OBJECTIVE: To determine the influence of environmental stress on the flowering and seed production characteristics of selected clones of white clover. This is part of a study of the influence of climate on genetic shift in synthetic varieties of forage plants.

EXPERIMENTAL PROCEDURE:

Location: B.R.V.L. near College Station, Texas

Soil type: Miller clay

Cultural Practices: Individual clones were established in 40-inch rows, 3 feet apart in the row, 5 plants per plot, 20 replications in March 1958. Plots were irrigated as needed and cultivated to keep the plots separated. No attempt was made to keep the 5 plants of a single plot separate.

Data: Seed were collected in 1959 and 1960. Measurement were obtained on spread, density, leaf size, seed yield, profuseness of flowering, and seed productinn potential.

RESULTS: See tables.

DISCUSSION: One clone in each of the two white clover synthetics either failed to flower or produced only a few scattered flowers. Seed yields these white clover clones were lower in 1960 than in 1959, but the range of varibility for seed production among the clones of each synthetic was equally great in both years. Vigor of the white clover clones was not associated with potential for seed production.

PROJECT: Hatch 1259

DATE SUBMITTED: February 1961

WORKER: R. D. Staten

South Carolina White Clover Synthetic - Data Summary - College Station, Texas, 1960

Clone	Stand May 1960	Spread 1=Good 5=Poor	Density 1=Good 5=Poor	Leaf Size 1=Large 5=Small	Date of first flowering 1 per plot	5 per plot	20 per plot
	%						
J 269	96	1.2	1.3	4.0	5/7	5/12	5/15
K 462	94	1.4	2.2	4.4	5/1	5/7	5/15
L 2682	98	1.2	1.7	2.9	5/1	5/7	5/15
M 3756	98	2.9	3.1	2.6	4/20	4/27	5/1
N 3757	100	1.2	1.8	3.5	5/12	6/3	6/17
O 4292	96	2.2	1.9	3.5	5/7	5/12	5/21
No. of Reps	20	10	10	10	10	10	10

South Carolina White Clover Synthetic - Data Summary, College Station, Texas, 1960

Clone	Profuseness of flowering (1=Many, 5=None)[1/] 5/7	5/12	5/21	6/3	6/17	7/1	Date Seed Harvested	Actual Seed Yield (lbs/a)
J 269	4.9	4.5	---	---	---	3.9	6/30	3.83
K 462	4.8	4.3	3.9	---	---	---	7/1	3.62
L 2682	4.8	4.2	3.6	3.8	---	---	7/1	2.32
M 3756	3.6	2.5	---	---	---	---	7/1	4.20
N 3757	5.0	4.8	5.0	4.5	3.6	4.7	6/30	.26
O 4292	4.9	4.6	4.0	4.6	---	---	7/1	1.45
No. of Reps		10						20

1/ Flowering scores for all dates except 5/12/60 estimated from flower collection data.

South Carolina White Clover Synthetic - Data Summary, College Station, Texas, 1960

Clone	No. Florets per Head[1]				No. Seed per Floret[1]				Weight of 100 Seed			
	5/21	6/3	6/17	7/1	5/21	6/3	6/17	7/1	5/21	6/3	6/17	7/1
J 269	54.8	56.6	55.1	47.8	2.80	2.70	2.35	1.80	.039	.036	.028	.026
K 462	51.7*	50.5	61.0	41.7	3.70*	3.70	3.25	2.40	.033*	.033	.024	.023
L 2682	51.8*	56.3*	64.9	52.3	2.15*	2.50*	2.00	1.70	.042*	.040*	.026	.024
M 3756	54.6	50.8	61.5	47.1	2.63	2.47	2.53	2.23	.047	.044	.030	.027
N 3757	---	66.0*	56.3	40.4*	---	3.08*	3.09	2.83*	---	.038*	.032	.029*
O 4292	66.0*	67.3*	66.9	47.6	2.94*	2.76*	2.53	2.09	.045*	.044*	.025	.025
No. of reps	10	10	10	10	10	10	10	10	10	10	10	10

[1] Floret count based on 4 heads per rep. and seed count based on 5 florets from each head.
* Only 5-6 of first 10 reps had flowers.

Pasture Laboratory White Clover Synthetic - Data Summary - College Station, Texas, 1960

Clone	No. Florets per Head[1]					No. Seed per Floret[1]					Weight of 100 Seed				
	5/7	5/21	6/3	6/20	7/1	5/7	5/21	6/3	6/20	7/1	5/7	5/21	6/3	6/20	7/1
T	---	56.9*	---	60.4	37.8**	---	2.28*	---	1.92	1.64**	---	.050*	---	.036	.029**
U	61.9*	58.5	54.8	68.1	49.1	1.75*	2.56	2.59	2.13	2.02	.061*	.052	.051	.039	.041
W	59.3	60.2	59.6	56.7	47.0	2.17	1.96	2.18	1.98	1.75	.054	.051	.049	.044	.041
X	---	62.3	58.9	55.0	46.6	---	2.74	2.80	2.40	2.10	---	.041	.040	.033	.031
Y	---	51.4	43.9	48.1	31.2	---	2.23	2.21	1.83	1.63	---	.058	.054	.044	.037
Z	---	52.6**	57.0*	66.3	46.1	---	2.51**	2.22**	1.84	1.48	---	.049**	.047*	.034	.034
No. of Reps	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

[1] Floret count based on 4 heads per rep. and seed count based on 5 florets from each head.
* 3 reps
** 5-6 reps

Pasture Laboratory White Clover Synthetic - Data Summary - College Station, Texas, 1960

Clone	Stand May 1960	Spread 1=Good 5=Poor	Density 1=Good 5=Poor	Leaf Size 1=Large 5=Small	Date of first flowering 1 per plot	5 per plot	20 per plot
	%						
T	99	1.4	1.3	1.8	5/12	5/21	6/9
U	97	1.9	2.2	2.1	5/7	5/9	5/12
W	100	2.7	2.8	4.3	4/20	4/27	5/2
X	98	1.5	1.4	2.5	5/9	5/10	5/12
Y	97	1.8	1.6	2.0	5/9	5/10	5/12
Z	100	1.3	1.2	3.5	5/12	5/21	6/9
No. of reps	20	20	20	20	10	10	10

Pasture Laboratory White Clover Synthetic - Data Summary - College Station, Texas, 1960

Clone	Profuseness of flowering (1=Many, 5=None)1/ 5/7	5/12	5/21	6/3	6/20	7/1	Date Seed Harvested	Actual Seed Yield (lbs/a)
T	5.0	4.6	4.7	4.9	3.0	4.0	7/11	1.00
U	4.4	2.3	---	---	---	---	7/7	14.40
W	2.8	1.5	---	---	---	---	7/7	7.88
X	5.0	3.3	---	---	---	---	7/8	4.73
Y	5.0	2.7	---	---	---	---	7/8	6.84
Z	5.0	4.7	4.5	4.7	---	---	7/11	4.13
No. of reps		20						20

1/ Flowering scores for all dates except 5/12/60 estimated from flower collection data.