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Farm pastures of the prairie area of Mississippi

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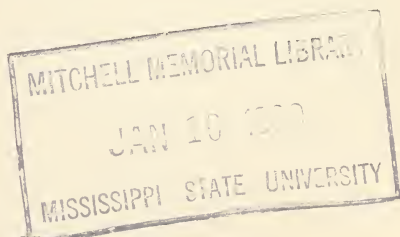
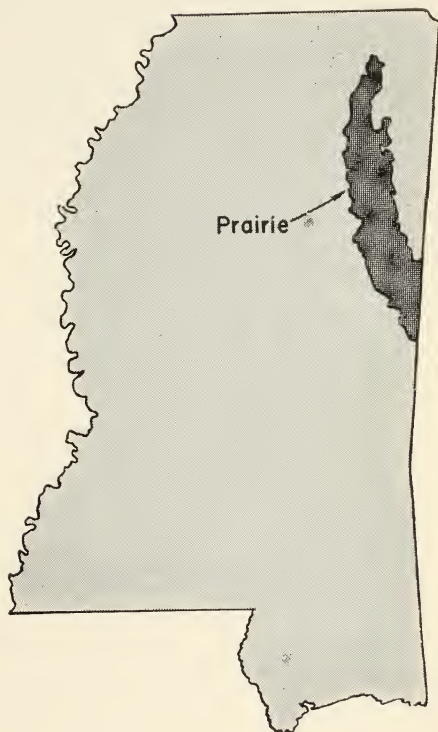
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Farm Pastures
of the
Prairie Area
of
Mississippi



Mississippi State University
AGRICULTURAL EXPERIMENT STATION

CLAY LYLE, Director

Summary and Conclusions

This study was conducted for the purpose of providing monthly estimates of livestock-carrying capacities of pastures in the Prairie Area of Mississippi, together with the associated costs, by type of land and type of sod.

These estimates were obtained for two types of land (1) land ranging from well-drained to low and wet, and (2) land which is drier than that included in the first type. Three types of sod were considered: (a) Bermuda and Dallis sods, (b) Bermuda and Dallis sods with small grains sod-seeded, and (c) fescue sods.

Estimates were also obtained for two levels of improvement for each land-type, sod-type combination. In addition, estimates were obtained for two levels of improvement for (a) small grains on cropland and (b) Sudan or millet.

For each type of sod or grazing crop studied, more grazing was obtained from Type 1 land than from Type 2 land. Likewise more grazing was obtained from the higher level of improvement than from the lower level.

Profitability of pasture improvement depends upon the manner in which the added grazing is utilized. However, another research project indicates that pasture improvement, at least to the average level reported in this study, is extremely profitable when the pasture is fully utilized. These results will be published in a Mississippi Agricultural Experiment Station bulletin entitled "An Economic Evaluation of Alternative Methods of Beef Production in the Prairie Area of Mississippi."

FARM PASTURES OF THE PRAIRIE AREA OF MISSISSIPPI

By T. E. TRAMEL, D. W. PARVIN,
and J. E. BETTS

The Problem. The soils of the Prairie area of Mississippi are well suited to grassland farming. A growing shortage of farm labor, relatively high prices for livestock and livestock products, and governmental cotton acreage reduction programs have given added interest to using livestock as one of the main enterprises on prairie farms.

For more than the past decade considerable emphasis has been given to pasture improvement as a means of increasing both the quantity and quality of available grazing. It was the purpose of this study to determine the effect of pasture improvement that farmers are actually doing upon carrying capacities, and at the same time provide monthly estimates of carrying capacities for different sods and different types of land for varying levels of improvement.

Method of Study. Data for the study were obtained by personal interviews with 269 livestock producers in the Prairie area of the state. Details of procedures used in calculating pasture costs and carrying capacities are given in the Appendix.

Land Use

Size of farms studied averaged 532 acres, of which 87 percent was owned by the operator (Table 1). Open permanent pastures accounted for slightly more than half of the land. Cropland accounted for approximately another third. Open permanent pasture was almost equally divided between native pastures and land which had been seeded with at least one kind of pasture plant.

DEFINITIONS

Throughout this report, including tables and the Appendix, the following terms apply:

Land Types

Type 1 land is well drained to low and wet.

Type 2 land is drier than Type 1.

Levels of Improvement

No improvement refers to all observations with no annual costs for land preparation, fertilization, or seeding.

Some improvement refers to all observations with an annual cost for at least one of these items.

Lower half and upper half refer a division of all observations on the basis of annual costs other than mowing.

Annual Costs and Carrying Capacities

Bermuda and Dallis Sods. Slightly more than half of the individual pasture areas studied which were classified as Bermuda and Dallis sods had no pasture improvement practices other than mowing (Table 2). Cow-days of grazing per acre for this type of pasture averaged 77 as contrasted to 102 for the areas which had some improvement. Annual pasture costs for the two groups averaged \$0.81 and \$3.44, respectively.

Land classed as Type 1 land appears to be better pasture land than that classed as Type 2. Cow-days of grazing averaged 99 for Type 1 compared to 80 for Type 2, with little difference shown in

annual cost. The same relationship is shown between land types for the no improvement situation and for the some improvement situation.

Bermuda and Dallis Sodds with Small Grains Sod-Seeded. Greater differences in grazing were shown between land-types than between the lower and upper half for this type of sod (Table 3). Cow-days of grazing per acre averaged 177 for Type 1 land compared to 146 for Type 2 land. Annual costs averaged \$17.74 and \$15.51, respectively. As was the case with Bermuda and Dallis sods, the same relationship is shown for both levels of improvement. Of the average

of 162 cow-days of grazing per acre for this sod-type, 48 were during the period April 1 to October 31.

Fescue Sodds. Considerable differences in grazing were shown between land types and between levels of improvement for fescue sods (Table 4). Farmers having an annual cost of \$2.26 per acre obtained 132 cow-days of grazing per acre compared to 182 days for farmers having an annual cost of \$10.38. Type 1 land furnished 162 cow-days of grazing compared to 148 days for Type 2 land, both types having essentially the same average cost.

Table 1. Average land use for 269 Prairie farms, Mississippi, 1956.

Item	Acres	Percent of total
Owned	462	87
Rented-in.....	85	13
Rented-out	15	---
Operated	532	100
Cropland	164	31
Seeded permanent pasture	149	28
Native permanent pasture	133	25
Woodland pasture	50	9
Woodland	17	3
Other land	19	4
Total	532	100

Table 2. Annual costs per acre, Bermuda and Dallis sods, by type of land and level of improvement, 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Annual costs (dollars)					No. cow-days grazing ¹
		Mow-ing	Land prep.	Ferti-lizer	Seed	Total	
Type 1 land, no improvement	207	.84	---	---	---	.84	89
Type 2 land, no improvement	224	.78	---	---	---	.78	66
Type 1 land, some improvement	186	1.16	.42	1.49	.54	3.61	110
Type 2 land, some improvement	202	1.10	.40	1.20	.58	3.28	95
Type 1 land, all farms	393	.99	.20	.71	.25	2.15	99
Type 2 land, all farms	426	.93	.19	.57	.28	1.97	80
No improvement, all farms	431	.81	.00	.00	.00	.81	77
Some improvement, all farms	388	1.13	.41	1.33	.57	3.44	102
All farms	819	.96	.20	.64	.27	2.07	90

¹For seasonal distribution of grazing see Appendix Table 1.

Small Grains and Sudan or Millet.
Cow-days of grazing by level of annual cost for small grains on cropland and for Sudan or millet are presented in Ta-

ble 5. For small grains, cow-days of grazing averaged 116 per acre per year at a cost of \$20.60. For Sudan or millet an average of 128 days was obtained at a cost of \$14.38..

Table 3. Annual costs per acre, Bermuda and Dallis sods with small grains sod-seeded, by type of land and level of improvement 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Annual costs (dollars)					No. cow-days grazing ¹
		Mow-ing	Land prep.	Ferti-lizer	Seed	Total	
Type 1 land, lower half	31	1.46	3.03	3.70	4.36	12.55	177
Type 2 land, lower half	31	.85	3.31	2.56	4.03	10.75	142
Type 1 land, upper half	31	1.25	4.94	11.17	5.56	22.92	178
Type 2 land, upper half	32	.71	4.70	9.36	5.36	20.13	152
Type 1 land, all farms	62	1.36	3.99	7.43	4.96	17.74	177
Type 2 land, all farms	63	.78	4.01	6.01	4.71	15.51	146
Lower half, all farms	62	1.16	3.17	3.13	4.19	11.65	160
Upper half, all farms	63	.98	4.82	10.27	5.46	21.53	165
All farms	125	1.07	4.00	6.72	4.83	16.62	162

¹For seasonal distribution of grazing see Appendix Table 2.

Table 4. Annual costs per acre, fescue sods, by type of land and level of improvement, 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Annual costs (dollars)					No. cow-days grazing ¹
		Mow-ing	Land prep.	Ferti-lizer	Seed	Total	
Type 1 land, lower half	42	.87	.42	.39	.56	2.24	135
Type 2 land, lower half	21	.75	.41	.33	.80	2.29	127
Type 1 land, upper half	43	.85	1.67	6.59	.91	10.02	189
Type 2 land, upper half	21	.94	1.81	7.72	.64	11.11	170
Type 1 land, all farms	85	.86	1.05	3.53	.74	6.18	162
Type 2 land, all farms	42	.85	1.11	4.02	.72	6.70	148
Lower half, all farms	63	.83	.42	.37	.64	2.26	132
Upper half, all farms	64	.88	1.72	6.96	.82	10.38	182
All farms	127	.86	1.07	3.69	.74	6.36	158

¹For seasonal distribution of grazing see Appendix Table 3.

Table 5. Annual costs per acre, small grains on cropland and Sudan and millet, by level of improvement, 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Annual costs (dollars)				No. cow-days grazing ¹
		Land prep.	Ferti-lizer	Seed	Total	
Small grains on cropland:						
Lower half	28	4.92	6.23	4.72	15.87	110
Upper half	29	6.78	12.26	6.11	25.15	121
All farms	57	5.88	9.29	5.43	20.60	116
Sudan and millet:						
Lower half	13	3.68	3.67	2.94	10.29	118
Upper half	14	4.85	9.00	4.34	18.19	137
All farms	27	4.28	6.44	3.66	14.38	128

¹For seasonal distribution of grazing see Appendix Table 4.

APPENDIX

Methods Used in Calculating Annual Pasture Costs and Carrying Capacities

Data were collected separately for five types of land and forty different combinations of permanent pasture plants. In the analysis, however, it was necessary, because of limited numbers of observations, to combine land types until only two remained and to combine sod types until only three remained.

The two land types used were: (1) land ranging from well-drained to low and wet, and (2) land drier than the first type. The three sod types used were: (a) Bermuda and Dallis grass sods, (b) Bermuda and Dallis grass sods with small grains sodseeded, and (c) fescue sods.

The number of cases reported refers to the number of observations prior to combining several groups, i.e., for one farm there might have been several observations which were later combined into one. In addition to permanent pasture, data were collected for small grains on cropland and sudan and millet.

Costs. Farmer estimates of quantities of seeds and fertilizers applied during 1950-1956 and land preparation and mowing done during the same period were used in calculating annual pasture costs. In calculating costs for each item, average prices paid by farmers during 1952-56 for seed and fertilizers were used (Appendix Tables 6 and 7).

Costs for land preparation and mowing

Appendix Table 1. Bermuda and dallis grass sods—normal carrying capacities per acre, by type of land and level of improvement, 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Number of mature cows								
		Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	
Type 1 land, no improvement	207	.16	.37	.53	.53	.44	.36	.30	.21	
Type 2 land, no improvement	224	.14	.31	.42	.39	.31	.25	.20	.14	
Type 1 land, some improvement	186	.27	.53	.68	.63	.52	.40	.33	.24	
Type 2 land, some improvement	202	.21	.44	.60	.57	.45	.36	.29	.20	
Type 1 land, all farms	393	.21	.44	.60	.58	.48	.38	.32	.22	
Type 2 land, all farms	426	.17	.37	.50	.48	.38	.30	.25	.17	
No improvement, all farms	431	.15	.34	.47	.46	.37	.31	.25	.18	
Some improvement, all farms	388	.24	.49	.63	.60	.48	.38	.31	.22	
All farms	819	.19	.41	.55	.53	.43	.34	.28	.20	

Appendix Table 2. Bermuda and dallis grass sods with small grains sod-seeded—normal carrying capacities per acre, by type of land and level of improvement, 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Number of mature cows											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Type 1 land, lower half	31	.24	.35	.63	.96	.95	.67	.59	.48	.41	.30	.11	.11
Type 2 land, lower half	31	.25	.32	.51	.68	.73	.58	.45	.40	.33	.21	.06	.13
Type 1 land, upper half	31	.37	.47	.63	.79	.93	.71	.58	.45	.31	.22	.16	.23
Type 2 land, upper half	32	.28	.43	.63	.83	.83	.58	.42	.35	.21	.15	.11	.18
Type 1 land, all farms	62	.31	.41	.63	.88	.94	.69	.58	.47	.36	.26	.13	.17
Type 2 land, all farms	63	.27	.37	.57	.75	.78	.58	.43	.37	.27	.18	.09	.15
Lower half, all farms	62	.24	.34	.57	.82	.84	.62	.52	.44	.37	.26	.08	.12
Upper half, all farms	63	.32	.45	.63	.81	.88	.65	.50	.40	.26	.18	.14	.20
All farms	125	.29	.39	.60	.82	.86	.63	.51	.42	.31	.22	.11	.16

(Appendix Table 8) were based on farm management studies and adjusted to the 1952-56 period.

After calculating cost of each item used in pasture improvement, cost of each item was prorated to an annual basis by the following methods: For annual plants, seeds and their application were charged to the year applied. For perennials, costs of seeds, their application, and land preparation were distributed over a ten-year period. For fertilizers and for applying fertilizers, nitrogen was charged to the year applied; 40 percent of the cost of phosphates, potash, and basic slag was charged to the year applied, 40 percent to the sec-

ond year, and the remaining 20 percent to the third year. Twenty percent of the cost of lime and its application was charged to each of the first four years, 10 percent to the fifth and 10 percent to the sixth. Costs presented are for the year 1956 calculated on this basis.

Carrying Capacities. For each of the original types of land and for each of the original sod types, farmers estimated the number of mature cows which could secure adequate grazing in each month of a normal year from the acreage he had, with pasture growth not accumulating from month to month. These estimates were then divided by the acreages for

Appendix Table 3. Fescue sods—normal carrying capacities per acre, by type of land and level of improvement, 269 Prairie farms, Mississippi, 1956.^{*}

Item	No. cases	Number of mature cows											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Type 1 land, lower half	42	.23	.27	.39	.55	.65	.58	.45	.35	.30	.26	.20	.20
Type 2 land, lower half	21	.16	.22	.41	.56	.59	.51	.40	.35	.33	.29	.19	.17
Type 1 land, upper half	43	.44	.47	.62	.83	.84	.67	.46	.38	.36	.36	.37	.41
Type 2 land, upper half	21	.43	.49	.66	.80	.77	.58	.38	.33	.30	.27	.23	.35
Type 1 land, all farms	85	.34	.37	.51	.69	.74	.63	.45	.37	.33	.31	.29	.31
Type 2 land, all farms	42	.29	.35	.53	.68	.68	.55	.39	.34	.32	.28	.21	.26
Lower half, all farms	63	.21	.25	.40	.55	.63	.56	.43	.35	.31	.27	.20	.19
Upper half, all farms	64	.44	.48	.63	.82	.82	.64	.42	.36	.34	.33	.32	.39
All farms	127	.32	.37	.52	.69	.73	.60	.44	.35	.33	.30	.26	.29

Appendix Table 4. Small grains on cropland—normal carrying capacities per acre, by level of improvement, 269 Prairie farms, Mississippi, 1956.

Item	No. cases	Number of mature cows									
		Jan.	Feb.	Mar.	Apr.	May	June	Nov.	Dec.		
Lower half	28	.39	.48	.70	.91	.78	.17	.04	.16		
Upper half	29	.44	.56	.77	.96	.73	.16	.12	.27		
All farms	57	.42	.52	.74	.94	.75	.17	.08	.22		

Appendix Table 5. Sudan and millet—normal carrying capacities per acre, by level of improvement, 269 Prairie farms, Mississippi, 1956.¹

Item	No. cases	Number of mature cows				
		June	July	Aug.	Sept.	Oct.
Lower half	13	.16	.93	1.61	1.12	.36
Upper half	14	.07	1.12	1.65	.79	.21
All farms	27	.16	.93	1.61	1.12	.36

¹Seasonal distribution can be varied by varying planting dates.

each land-type, sod-type combination to obtain estimates for carrying capacities for each land-type, sod-type combination on each farm. The latter figures were then grouped for the different situations presented.

Appendix Table 6. Fertilizer costs per ton used in calculating pasture costs, 269 Prairie farms, Mississippi, 1956.

Kind of fertilizer	Cost per ton	Kind of fertilizer	Cost per ton
	Dollars		Dollars
0 - 14 - 14	42.50	Nitrate of soda	66.10
4 - 8 - 4	39.10	Calcium phosphate	18.90
4 - 12 - 12	45.80	Superphosphate (18%)	25.30
5 - 10 - 5	43.80	Superphosphate (20%)	28.40
6 - 6 - 4	41.00	Triple superphosphate (40%)	50.70
6 - 8 - 4	43.80	Triple superphosphate (42%)	53.20
6 - 8 - 8	46.60	Triple superphosphate (45%)	57.00
12 - 12 - 12	64.70	Triple superphosphate (48%)	60.80
13 - 13 - 13	70.10	Rock phosphate	17.80
14 - 14 - 14	75.50	Muriate of potash	44.60
Anhydrous ammonia	129.10	Lime	3.75
Ammonium nitrate	78.60	Basic slag	15.00
Calcium nitrate	62.00		

Appendix Table 7. Seed costs per pound used in calculating pasture costs, 269 Prairie farms, Mississippi, 1956.

Kind of seed	Cost per ton	Kind of seed	Cost per ton
	Dollars		Dollars
Black medic clover	.20	Ladino clover	.92
Bur clover	.24	Vetch (hairy)	.18
Button clover	.24	Wild winter peas	.10
Crimson clover	.30	Bahia grass	.35
Hop clover	.40	Bermuda grass	.71
Lappacea clover	.30	Carpet grass	.20
Lespedeza, common	.57	Dallis grass	1.00
Lespedeza, Kobe	.26	Fescue	.25
Lespedeza, Korean	.20	Johnson grass	.25
Melilotus clover	.20	Millet	.14
Persian clover	.35	Oats	.05
Red clover	.47	Ryegrass	.12
Sericea	.33	Sudan	.13
White clover	.87	Wheat	.06

Appendix Table 8. Costs per acre once over equivalent for land preparation, applying fertilizers, seeding and mowing used in calculating pasture costs, 269 Prairie farms, Mississippi, 1956.

Operation	Tractor	Equipment	Labor	Total
	—Dollars—			
Breaking (2-bottom plow)	1.10	.35	.60	2.05
Discing (tandem or double action disc)	.45	.20	.25	.90
Discing (single action disc-single cut)	.30	.15	.20	.65
Seeding (hand cyclone seeder)			.15	.15
Seeding (drill)	.35	.30	.25	.90
Sod seeding (pasture dream)	.60	1.85	.35	2.80
Renovating	1.45	.50	.80	2.75
Fertilizing (czee flow)	.50	.25	.30	1.05
Cultipacking	.30	.10	.15	.55
Spreading manure (manure spreader)	1.30	.60	.85	2.75
Mowing	.35	.40	.20	.95
Harrowing	.25	.05	.15	.45