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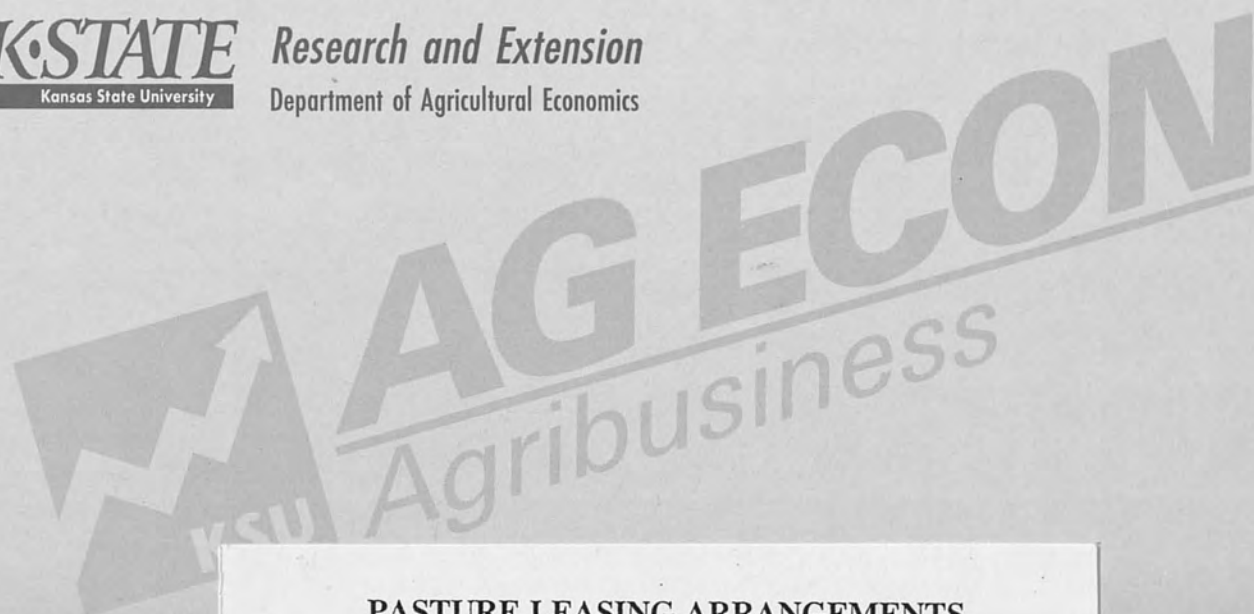
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*Research and Extension*  
Department of Agricultural Economics



**PASTURE LEASING ARRANGEMENTS  
IN KANSAS**

by Bill B. Golden,  
Leah J. Tsoodle, and Holly M. Bigge

JULY 2003  
Staff Paper No. 04-01

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## **Introduction**

Pastureland is Kansas' second largest agricultural land use. As a resource, grazing land supports the beef and sheep industries, provides habitat for wildlife, and provides surface water to streams. Within Kansas, pastureland is separated into two classes, tame and native. These are more commonly referred to as improved pasture and rangeland. Tame pasture is primarily introduced grass species that are planted and managed with agronomic practices (seeding, fertilizer, etc.). The major species are smooth Brome grass, tall fescue, and Bermuda grass. More recently, native species have been planted using similar practices with similar performance characteristics. Native pasture is rangeland that contains grasses native to the region, without improvement through agronomic practices.

In conjunction with the Land Use Value Project, the Department of Agricultural Economics at Kansas State University (KSU) participates in the collection and dissemination of survey information. The following represents a summary of the most recent survey on pasture lease arrangements, in Kansas. This information should be useful to Extension personnel, consultants, lenders, producers, and landowners to better understand the various pasture leasing arrangements that exist in Kansas.

## **Sources of Pasture Leasing Information**

Kansas Agricultural Statistics (KAS) conducts one survey each year in conjunction with the Land Use Value Project in the Department of Agricultural Economics at Kansas State University (KSU). There are four surveys rotated by KAS in conjunction with KSU: irrigated leases, non-irrigated leases, pasture leases, and input costs. During 2002, the Pasture Lease Survey was conducted to gather data on the 2001 calendar year. The most recent prior survey,

conducted by KAS/KSU, of pasture leasing arrangements was compiled in 1998 for the 1997 crop year.

KAS divides Kansas into nine crop-reporting districts (Figure 1). By design the KAS surveys conducted for the Land Use Value Project tend to be focused toward landowners (i.e., landlords). This is because the purpose of the Land Use Value Project is to calculate landlord net income for different soil types in the KAS crop reporting districts for the Kansas Department of Revenue. Direct comparison between the 2002 and the 1998 survey results is appropriate as they were both preformed by KAS/KSU, the sampling procedures and population were the same, and both used comparable formats.

KAS follows the same sampling procedure for all of their surveys conducted jointly with KSU. They draw the sample from their database, which contains landowners, producers, and owner/operators. The sample size is large enough to ensure that a statistically significant number of responses are received from each district. This survey resulted in 692 complete observations on pasture leases (Table 1), as compared to 542 observations in the 1998 survey. Survey observations are identified by crop reporting district. Along with pasture rental rates, each survey respondent indicated the type of: a) pasture ownership/rental regime, b) beef enterprise, c) grazing system, d) water source, e) fence construction and repair arrangement, f) weed control cost sharing agreement, and g) fertilizer cost sharing agreement. A copy of the survey is available upon request and additional information pertaining to the survey is available from the Kansas State University Department of Agricultural Economics or from Kansas Agricultural Statistics. Email inquiries can be sent to Leah Tsoodle at [ltsoodle@ksu.edu](mailto:ltsoodle@ksu.edu).

### **Enterprise Classification**

The 2002 Pasture Lease Survey provides information about the distribution and characteristics of the structure of Kansas livestock enterprises. There has been very little change in the structure of the beef industry in Kansas in the past four years (Tables 2a and 2b). As a general rule, producers in Kansas focus on cow/calf production, with 75% of all observations falling into this category. An additional 12% of respondents have both cow/calf operations and stocker feeder operations. A typical producer grazes his pasture all season long as opposed to intensive or rotational grazing. It appears that fewer operators are renting pasture to meet their grazing needs. This might imply that more producers are either purchasing land or have reduced the scale of their operation since 1998 and are only producing on land that they currently own. Additionally, this finding might reflect the trend to a higher percent of hobby ranchers. Finally, it may reflect a sampling bias in favor of landowners.

### **Cash Rents**

The distribution and characteristics of producer leases are addressed with the 2002 Pasture lease survey. Table 3 illustrates the distribution of cash rents for both Tame and Native pasture, by crop reporting district (CRD). In general, cash rent increases moving from west to east and from south to north. This pattern is highly correlated with temperature and rainfall patterns. It reflects the fact that, within Kansas, natural forage production increases as rainfall increases and temperature decreases. Increased grass production potential is reflected in rental values.

Generally, Tame pasture is valued more by producers than Native pasture, as illustrated by the difference in rental value. As an example, in NE-70, on average, Tame pasture rents for 15.47% more than Native pasture. The difference in rental value between Tame and Native has changed significantly since 1998. For example, in C-50, the 1998 survey indicated that Tame

pasture was worth a 26.59% premium over Native. In 2002 the premium was only 1.64%. In SC-60 the pricing ratio is reversed; here, Native pasture brings a premium. Tsoodle, Golden and Featherstone (2003), suggest that the increasing value of Native pasture may be driven by urban and recreational demands. Additional research is needed to determine if these changes are statistically significant and assess probable causes of this shift.

### **Pasture Size and Fence Requirements**

The mode pasture size and average number of feet of fence per acre were calculated by district. An underlying assumption for this calculation is that a single boundary fence is common to adjoining pastures. As a result, only one half of the perimeter fence is reported. The 1998 results are provided for comparison purposes. As a general rule, both Tame and Native mode pasture size decreases from western to eastern Kansas (Table 4). Additionally, the mode size of Native pastures tends to be larger than Tame pastures. This reflects the more management intensive nature of Tame pasture.

The amount of fence required per acre is a function of pasture size, shape, and number of cross fences. As the pasture size increases, the amount of fence per acre decreases, and as pasture size becomes more irregular, the amount of fence per acre increases. As a result, the smaller pastures in the eastern portion of the state will have a higher average feet of fence per acre and consequently a higher cost of fence. The irregular size of most native pasture would imply that, for the same Native and Tame pasture size, Native pastures would require more feet of fence per acre.

### **Fence Construction**

The most prevalent wire is barbed wire (Tables 5a and 5b). In Western Kansas, 4 strand fences are typical, while 5 strands are the mode in all other areas. Additionally, Western Kansas

tends to use more treated post than other areas. These results are fairly consistent with the 1998 survey.

### **Fence and Water Maintenance Costs**

For Native pasture, both fence maintenance costs and water maintenance costs have increased substantially since 1998 (Table 6a). On average, the annual cost of maintaining fences has risen by approximately 65%, while the average annual cost of maintaining the water supply has increased by approximately 161%. These costs tend to increase as one moves from west to east across the state.

For Tame pasture, both fence maintenance costs and water maintenance costs have increased substantially since 1998 (Table 6b). On average the annual cost of maintaining fences has risen by approximately 66%, while the average annual cost of maintaining the water supply has increased by approximately 232%. These costs tend to increase as one moves from west to east across the state.

The annual fence maintenance costs coincide with the higher costs of building new fences and the trend for slightly higher fence costs in Eastern Kansas. The trend in water maintenance costs is more difficult to explain. The typical water source in Eastern Kansas is a farm pond which would normally have a lower maintenance cost than a well, as reflected in the 1998 results. In 2002, most of Eastern Kansas was suffering drought conditions, which would have forced dredging of farm ponds and increased the maintenance expenses. Additionally cost-share components of the Environmental Quality Incentive Program (EQIP), approved by the 2002 Farm Bill, could have generated increased water maintenance costs. It is possible that these 'recency effects' might have biased the results.

Comparing the 2002 costs between Tame and Native pasture, we find that both fence and water costs are higher for Tame pasture. This is consistent with the 1998 data, and probably a reflection of the higher management intensity associated with Tame pastures.

### **Fertilizer Application**

Table 7 summarizes the type and quantity of fertilizer applied on a per acre basis in various parts of the state. As a general rule, fertilizer application rates increased in 2002. Fertilizer usage increases in the Eastern portion of the state. This is due to higher rainfall and a larger percentage of more intensively managed Tame pasture.

### **Landlord's Share of Expenses**

Due to the nature of livestock production, the vast majority of pastureland is leased on a cash basis. However, it is not unusual for landlords to participate in yearly expenses, especially those that impact the long-term asset value of the land. Tables 8a and 8b provide information on the type and percent of expenses in which landlords participate. As a general rule, landlords provide the materials for brush control, fence maintenance, and the construction of new fences. The tenant will normally provide the labor for these expense categories. In an analysis of the 1998 survey, O'Brien (2000) showed that alternative landlord-tenant cost share arrangements for fence repair and replacement, weed control, and fertilizer did not have a significant impact upon pasture rental rates in the statewide model.

### **Conclusion**

The pastureland rental market in Kansas is quite dynamic. Changes in farm policy, commodity prices, and technology obviously will affect farm structure, and rental arrangements. It is not always apparent what the forces are that have been driving current rental changes. Some possible influences have been discussed and both quantitative and qualitative data provided.

However, one of the most powerful influences, the effect of the traditional arrangements present in a region, has not yet been considered. Albright, et al (1996) suggested that traditional arrangements, which have been in place for lengthy time periods, may not be affected by changes in markets, legislation, or farming practices. Other extension specialists contend that, relatively speaking, tradition is changing rapidly.

Related K-State Research and Extension publications pertaining to pasture-land leasing arrangements include the following:

Albright, Martin, Daniel O'Brien, and James Sartwelle. "Crop Lease Arrangement Market Issues and Trends." Kansas State University, Department of Agricultural Economics, Manhattan, Kansas, 1996.

Buller, et al, "Economic Evaluation of Season-Long and Intensive-Early Stocking System." Contribution number 90-274-S from KAES, 1990.

Jones, Rodney, " Summer Grazing of Steers in Western Kansas." Publication Number MF1007, October 2001

Jones, Rodney, " Summer Grazing of Steers in Eastern Kansas." Publication Number MF1008, October 2001

Langemeier, Larry N. "Pasture Rental Arrangements for Your Farm." North Central Regional Publication #149 (NCR 149), revised 1997

O'Brien, D., "Factors Affecting Kansas Pasture Rental Rates." K-State Research and Extension, November 2000

Tsoodle, Leah, Bill Golden, and Allen Featherstone. "Determinants of Kansas Agricultural Land Values." Selected Paper prepared for presentation at the Southern Agricultural Economics Association Annual Meeting, Mobile, Alabama, February 1-5, 2003

Figure 1. Kansas Crop Reporting Districts



Table 1: 2002 Pasture Survey Summary

## District Response Rate

District	Surveys Sent	Responses	Response Rate
Northwest-10	250	69	27.6%
West Central-20	250	65	26.0%
Southwest-30	250	61	24.4%
North Central-40	300	82	27.3%
Central-50	250	76	30.4%
South Central-60	250	84	33.6%
Northeast-70	400	73	18.3%
East Central-80	300	88	29.3%
Southeast-90	250	94	37.6%
State	2,500	692	27.7%

**Table 2a: 1998 Pasture Survey Summary**

## 1998 District Mode Classifications

Note: All values are the mode unless otherwise stated.

	Pasture Classification	Type of Operation	Grazing Type
NW-10	Own and Rent Pasture	Cow/Calf	Season-Long
WC-20	Own and Rent Pasture	Cow/Calf	Season-Long
SW-30	Own and Rent Pasture	Cow/Calf	Season-Long
NC-40	Own and Rent Pasture	Cow/Calf	Season-Long
C-50	Own and Rent Pasture	Cow/Calf	Season-Long
SC-60	Own and Rent Pasture	Cow/Calf	Season-Long
NE-70	Own all Pasture	Cow/Calf	Season-Long
EC-80	Own and Rent Pasture	Cow/Calf	Season-Long
SE-90	Own all Pasture	Cow/Calf	Season-Long

**Table 2b: 2002 Pasture Survey Summary**

## 2002 District Mode Classifications

Note: All values are the mode unless otherwise stated.

	Pasture Classification	Type of Operation	Grazing Type
NW-10	Own and Rent Pasture	Cow/Calf	Season-Long
WC-20	Own and Rent Pasture	Cow/Calf	Season-Long
SW-30	Own and Rent Pasture	Cow/Calf	Season-Long
NC-40	Own all Pasture	Cow/Calf	Season-Long
C-50	Own and Rent Pasture	Cow/Calf	Season-Long
SC-60	Own all Pasture	Cow/Calf	Season-Long
NE-70	Own all Pasture	Cow/Calf	Season-Long
EC-80	Own all Pasture	Cow/Calf	Season-Long
SE-90	Own and Rent Pasture	Cow/Calf	Season-Long

Table 3: 2002 Pasture Survey Summary

### District Average Cash Rents & Tame/Native Rent Ratio

							2002		1998
	NATIVE			TAME			INDIVIDUAL		
	Average	Minimum	Maximum	Average	Minimum	Maximum	RATIO Average	RATIO Average	RATIO Average
NW-10	\$ 10.91	\$ 7.00	\$ 18.00	\$ 11.00	\$ 10.00	\$ 13.00	100.8%	100.0%	99.3%
WC-20	10.55	7.50	15.00	11.00	9.00	14.00	104.3%	102.3%	98.8%
SW-30	9.24	4.00	13.00	10.24	7.00	15.00	110.8%	144.4%	123.1%
NC-40	16.87	7.00	25.00	18.37	13.00	30.00	108.9%	100.0%	116.5%
C-50	14.27	7.00	24.00	14.50	10.00	25.00	101.6%	105.0%	126.6%
SC-60	12.82	7.00	20.00	12.25	8.00	16.50	95.5%	100.0%	122.6%
NE-70	19.57	8.00	40.00	22.60	10.00	35.00	115.5%	110.2%	100.4%
EC-80	17.09	10.00	25.00	18.63	9.00	30.00	109.0%	108.8%	110.5%
SE-90	16.76	10.00	25.00	19.00	7.50	30.00	113.4%	120.8%	113.7%

Table 4: 2002 Pasture Survey Summary

### District Mode Pasture Size & Feet of Fence per Acre

Intended Use: Will be used as the typical base pasture size and fencing requirement; used to determine initial fence costs.

	Native								Tame							
	Mode Size in Acres				Avg Ft of Fence/Ac				Mode Size in Acres				Avg Ft of Fence/Ac			
	2002		1998		2002		1998		2002		1998		2002		1998	
	Mode #	Resp.	Mode #	Resp.	Mode Avg.	# Resp.	Mode Avg.	# Resp.	Mode #	Resp.	Mode #	Resp.	Mode Avg.	# Resp.	Mode Avg.	# Resp.
NW-10	160	5-Tie	160	10	45.28	2	32.07	9	120	2	100	2	38.50	1	13.20	1
WC-20	160	7	160	12	25.01	6	33.34	9	100	1-Tie	160	1-Tie	0.00	0	23.65	0
SW-30	160	9	80	8	24.29	7	41.77	8	160	4	120	2	33.77	3	17.60	1
NC-40	160	10	80	13	39.54	5	36.04	9	60	1-Tie	50	3-Tie	52.80	1	57.20	3
C-50	160	9	80	10	38.84	6	36.92	6	60	1-Tie	60	2-Tie	0.00	0	44.00	2
SC-60	160	9	160	13	16.66	5	36.69	11	100	4	40	3	19.43	2	62.90	1
NE-70	80	7	40	9	45.69	6	43.21	5	30	5-Tie	50	7	57.53	4	48.17	5
EC-80	80	11	80	17	37.47	8	33.94	14	80	9-Tie	80	7-Tie	39.60	2	54.37	5
SE-90	80	8-Tie	80	9-Tie	72.91	5	34.75	5	80	11	80	10	60.60	7	36.43	6

Table 5a: 2002 Pasture Survey Summary

## District Mode Typical Fence Data

All results are the mode unless otherwise stated.

2002			1998		2002		1998	
FENCE TYPE	# RESP.		FENCE TYPE	# RESP.	POST TYPE	# RESP.	POST TYPE	# RESP.
NW-10	4-Wire Barb	44	4-Wire Barb	71	All Treated	42	All Treated	57
WC-20	4-Wire Barb	49	4-Wire Barb	76	All Treated	22	All Treated	37
SW-30	4-Wire Barb	29	4-Wire Barb	49	All Steel	10-TIE	All Steel	33
NC-40	4-Wire Barb	37	4-Wire Barb	54	3Steel/1Wood	15	All Steel	13
C-50	5-Wire Barb	39	5-Wire Barb	57	All Steel	20	All Steel	37
SC-60	5-Wire Barb	42	4-Wire Barb	52	All Steel	27	All Steel	46
NE-70	5-Wire Barb	42	5-Wire Barb	53	4Steel/1Wood	17	All Steel	29
EC-80	5-Wire Barb	60	5-Wire Barb	75	All Steel	39	All Steel	55
SE-90	5-Wire Barb	62	5-Wire Barb	72	All Steel	43	All Steel	62

Table 5b: 2002 Pasture Survey Summary

## District Mode Typical Fence Data

All results are the mode unless otherwise stated.

2002			1998		2002		1998		2002		1998	
POST SPACING			POST SPACING		CROSS		CROSS		FENCE		FENCE LIFE	
(FEET)			(FEET)		FENCE		FENCE		(YEARS)		(YEARS)	
		# RESP.		# RESP.		# RESP.		# RESP.		# RESP.		# RESP.
NW-10	20	12	16	22	None	26	None	31	20	13	30	15-TIE
WC-20	16.5	10	16.5	22	None	24	None	31	20	11	20	19
SW-30	16.5	11	16	16	None	12	None	24	25	5	20	13
NC-40	15	14	16.5	18	None	28	None	46	40	15	30	16
C-50	16	16	16	19	None	22	None	34	50	14	50	20
SC-60	16	20	16	25	None	35	None	45	30	12	40	23
NE-70	12	18	12	24	None	28	None	29	50	12	20	26
EC-80	15	16	15	19	None	26	None	34	50	14	20	20
SE-90	12	23	12	21	None	30	None	29	20	15	20	20-TIE

Table 6a: 2002 Pasture Survey Summary

## District Average Water Maintenance Cost

Note: Averages calculated using Total Native Pasture Acres  
Results include all responses.

NATIVE						
	2002			1998		
	Average Total Annual Maintenance Cost (\$/ACRE)	Average Water Cost (\$/ACRE)	Water Source	Average Total Annual Maintenance Cost (\$/ACRE)	Average Water Cost (\$/ACRE)	Water Source
NW - 10	1.37	0.83	Well	1.09	0.55	Windmill
WC - 20	2.67	0.88	Well/Windmill	0.77	0.53	Windmill
SW - 30	2.80	1.06	Well	1.03	0.56	Windmill
NC - 40	3.80	1.20	Pond	2.77	1.46	Pond
C - 50	3.25	1.07	Pond	2.21	0.24	Pond
SC - 60	2.62	0.79	Pond	1.49	0.57	Pond
NE - 70	4.19	1.71	Pond	4.68	0.78	Pond
EC - 80	4.21	3.98	Pond	3.71	0.29	Pond
SE - 90	10.24	1.94	Pond	3.49	0.17	Pond
Average	3.91	1.50		2.36	0.57	

Table 6b: 2002 Pasture Survey Summary

## District Average Water Maintenance Cost

Note: Averages calculated using Total Tame Pasture Acres  
Results include all responses.

	2002			TAME			1998		
	Average Total Annual Maintenance Cost (\$/ACRE)	Average Water Cost (\$/ACRE)	Water Source	Average Total Annual Maintenance Cost (\$/ACRE)	Average Water Cost (\$/ACRE)	Water Source	Average Total Annual Maintenance Cost (\$/ACRE)	Average Water Cost (\$/ACRE)	Water Source
NW - 10	0.04	0.97	Well	0.36	1.74	Windmill			
WC - 20	No Response	No Response	Well/Windmill	2.97	0.44	Windmill			
SW - 30	3.07	1.50	Well	0.00	0.76	Windmill			
NC - 40	3.35	2.96	Pond	6.50	0.00	Pond			
C - 50	6.49	7.61	Pond	3.34	1.23	Pond			
SC - 60	2.77	1.36	Pond	1.26	1.83	Pond			
NE - 70	4.16	1.42	Pond	3.60	0.27	Pond			
EC - 80	7.70	4.66	Pond	3.11	0.82	Pond			
SE - 90	7.65	1.63	Pond	2.67	0.41	Pond			
Average	4.40	2.76		2.65	0.83				

Table 7: 2002 Pasture Survey Summary

### District Average Fertilizer

Note: All values are the averages of respondents applying fertilizer  
Percent of

District	Producers Using Fert.	Nitrogen # Per Acre		Phosphorus # Per Acre		Pot ash # Per Acre		Mode of Month Applied	
		2002	1998	2002	1998	2002	1998	2002	1998
NW-10	0.0%	No Response	30.7	No Response	10.0	No Response	0.0	No Response	March
WC-20	0.0%	No Response	35.0	No Response	0.0	No Response	0.0	No Response	August
SW-30	4.9%	86.7	42.1	10.0	15.2	0.0	7.5	April	March
NC-40	12.2%	61.0	52.8	15.0	30.6	0.0	0.0	February/March	March
C-50	7.9%	68.3	92.2	27.5	27.2	15.0	0.0	February/March	March
SC-60	8.3%	73.7	78.8	39.3	36.6	30.0	0.0	April	March
NE-70	58.9%	112.2	100.8	44.0	42.5	38.3	100.0	March	March
EC-80	43.2%	113.3	83.5	59.9	45.6	68.3	47.5	February	March
SE-90	41.5%	96.5	86.7	37.8	43.6	47.1	40.6	March	March

Table 8a: 2002 Pasture Survey Summary

### District Mode Landlord Percent of Costs

Note: All values are the mode unless otherwise stated.

	Brush & Weed Control Chemicals	Brush & Weed Control Application	Brush & Weed Control Other	Burning	All Other Pasture Costs	Total Pasture Maintenance Costs
NW-10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
WC-20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SW-30	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NC-40	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C-50	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SC-60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
NE-70	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EC-80	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SE-90	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 8b: 2002 Pasture Survey Summary

### District Mode Landlord Percent of Costs

All values are the mode unless otherwise stated.

District	Fence Maintenance Material Costs	Fence Maintenance Labor Costs	Total Fence Maintenance Costs	Fertilizer Costs*	New Fence Material Costs	New Fence Labor Costs
NW-10	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
WC-20	100.0%	0.0%	0.0%	50.0%	100.0%	0.0%
SW-30	0.0%	0.0%	0.0%	50.0%	100.0%	0.0%
NC-40	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
C-50	100.0%	0.0%	0.0%	50.0%	100.0%	0.0%
SC-60	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
NE-70	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
EC-80	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
SE-90	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%

\* Represents average share for respondents applying fertilizer

