

## COMPLEMENTARY ROTATION GRAZING SYSTEM – 1983

### DICKINSON EXPERIMENT STATION

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The location of the complementary grazing system has been moved from the main headquarters to the recently acquired ranch headquarters of the Dickinson Experiment Station. The 1983 grazing season was the first year at the new location. The complementary rotation grazing system at the ranch headquarters consists of a crested wheatgrass (*Agropyron desertorum*) pasture for spring grazing, a native range three pasture rotation with twice over on each pasture for summer grazing, and an Altai wildrye (*Elymus angustus*) pasture for fall grazing. The trial compares animal performance and herbage production between two treatments. The east treatment will be inter-seeded with a pasture type alfalfa and the west treatment will not be inter-seeded and used as a control. The east treatment is scheduled to be inter-seeded in the spring of 1984. During the 1983 grazing season, both treatments were untreated to establish baseline data.

The soils of the crested wheatgrass and Altai wildrye pastures are primarily silt loams and loams. The soils of the native range pastures are primarily fine sandy loams, loams, silty clay loams, silt loams and silty clay.

The crested wheatgrass and Altai wildrye pastures were treated as monoculture pastures. The crested wheatgrass pastures were seeded prior to the experiment station occupation. The Altai wildrye was seeded into fallow soil in the spring of 1982 at a seeding rate of 8 pounds PLS per acre.

The native range pastures are on mixed grass prairie with four major range sites which are: clayey, sandy, shallow, and silty. The dominant graminoids are Blue grama (*Bouteloua gracilis*), Threadleaved sedge (*Carex filifolia*), Western wheatgrass (*Agropyron smithii*) and Prairie Junegrass (*Koeleria pyramidata*).

The data that were collected from these pastures were above ground herbage production, species composition by ten pin point frame and 0.1 meter square quadrats, leaf height measurements and phenological phases of eight major graminoid species, and animal performance by weight changes.

Four sample sites were systematically selected for each of the tame grass pastures. Each of the native range pastures had a sample site on each of the four major sites. Each of the respective range site sample sites were selected for similar soil, slope, and aspect in each pasture.

The above ground herbage production was sampled by clipping the vegetation to ground level inside ¼ meter square quadrats, both inside and outside enclosure cages. The herbage was separated into nine categories: cool short, warm short, cool mid, western wheatgrass, warm mid, warm tall, sedges, forbs and shrubs. The samples were oven dried at 80°C. The average herbage production for each category and the total production for each site were determined for each clipping period.

Quantitative species composition data were collected by the ten pin point frame method (Levy and Madden 1933, Tinney, Aamodt, and Ahlgren 1937, Heady and Rader 1958, and Smith 1959). One thousand points were read for each sample site. Forb and shrub density data were collected with a .1 meter square quadrat. The forbs and shrubs that were rooted within the frame were counted by species in each of the 20 quadrats per sample site.

Monthly leaf height measurements and phenological development of the flower stalks were collected for eight dominant graminoid species: *Agropyron desertorum*, *Elymus angustus*, *Agropyron smithii*, *Bouteloua gracilis*, *Koeleria pyramidata*, *Poa pratensis*, *Stipa comata* and *Carex filifolia*. Twenty-four plants of each species were selected at random on each sample site. All of the leaves of each plant were outstretched and measured to the nearest millimeter in sequence from the oldest to newest. Along with the length measurements, the degree of dryness for the leaf blades was recorded. The categories of dryness used were: 0, 0.1-2, 2.1-25, 25.1-50, 50.1-75, 75.1-98 and 100 percent dry. The highest value of the category was used to record the percentage of dryness for each leaf blade.

If the flower stalks were present, the height was measured and the phenological stage of development was recorded. The categories used were: flower stalk developing, head emergence, anthesis, seeds developing and seeds being shed.

Animal performance was determined by weight gains or losses. Cattle were weighed on and off each pasture during the scheduled rotation periods. These data were converted into mean weight gain in pounds per day per head and mean weight gain in pounds per day per acre for the calves, cows and bulls. The same cattle were used on all of the pastures of each treatment during the grazing season. Sixteen cow/calf pairs of commercial Hereford and Hereford X Angus were used on each treatment in 1983.

**Table 1. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Crested Wheatgrass on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	<b>25 Apr</b>	<b>10 May</b>	<b>25 May</b>	<b>10 Jun</b>	<b>25 Jun</b>	<b>5 Jul</b>	<b>20 Jul</b>	<b>1 Aug</b>	<b>15 Aug</b>	<b>30 Aug</b>	<b>15 Sep</b>	<b>15 Oct</b>	<b>15 Nov</b>
<b>System – WEST</b>													
<b>Ungrazed:</b>													
Crested Whtg.	437.1	1194.4		1975.8		1975.8	2129.6	1840.2	1611.0	1541.4			
Other Grasses	0.0	0.0		11.6		8.9	35.7	28.5	19.2	52.6			
Grass Total	437.1	1194.4		1987.4		1984.7	2165.3	1868.7	1630.2	1594.0			
Forbs Shrubs	19.3	39.3		44.6		30.3	40.1	20.5	23.2	4.0			
<b>Total</b>	456.4	1233.7		2032.0		2015.0	2205.4	1889.2	1653.4	1598.0			
<b>Grazed:</b>													
Crested Whtg.		1194.4		787.9		963.1	1183.1	1488.4	855.7	855.4			
Other Grasses		0.0		33.4		50.9	61.7	180.3	53.8	105.0			
Grass Total		1194.4		821.3		1014.0	1244.8	1668.7	909.5	960.4			
Forbs Shrubs		39.3		15.8		17.8	5.4	5.2	2.9	7.2			
<b>Total</b>		1233.7		837.1		1031.8	1250.2	1673.9	912.4	967.6			

**Table 2. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Crested Wheatgrass on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	<b>25 Apr</b>	<b>10 May</b>	<b>25 May</b>	<b>10 Jun</b>	<b>25 Jun</b>	<b>5 Jul</b>	<b>20 Jul</b>	<b>1 Aug</b>	<b>15 Aug</b>	<b>30 Aug</b>	<b>15 Sep</b>	<b>15 Oct</b>	<b>15 Nov</b>
<b>System – EAST</b>													
<b>Ungrazed:</b>													
Crested Whtg.	552.2	1578.0		1423.2		1554.8	1741.2	1352.7	1189.0	1479.8			
Other Grasses	0.0	0.0		31.2		21.0	12.9	30.8	9.4	42.4			
Grass Total	552.2	1578.0		1454.4		1575.8	1754.1	1383.5	1198.4	1522.2			
Forbs Shrubs	10.7	33.9		13.4		41.9	16.5	37.0	14.4	31.7			
<b>Total</b>	562.9	1611.9		1467.8		1617.7	1770.6	1420.5	1212.8	1553.9			
<b>Grazed:</b>													
Crested Whtg.		1578.0		814.2		732.6	1085.0	986.6	998.8	1048.5			
Other Grasses		0.0		12.2		18.6	47.3	29.1	24.7	36.6			
Grass Total		1578.0		826.4		751.2	1132.3	1015.7	1023.5	1085.1			
Forbs Shrubs		33.9		7.7		12.0	15.1	17.5	6.9	2.1			
<b>Total</b>		1611.9		834.1		763.2	1147.4	1033.2	1030.4	1087.2			

**Table 3. Mean Total above Ground Herbage Production in Lbs/Acre for the Crested Wheatgrass on the Complementary Grazing System at the Dickinson Experiment Station, 1983**

	<b>25 Apr</b>	<b>10 May</b>	<b>25 May</b>	<b>10 Jun</b>	<b>25 Jun</b>	<b>5 Jul</b>	<b>20 Jul</b>	<b>1 Aug</b>	<b>15 Aug</b>	<b>30 Aug</b>	<b>15 Sep</b>	<b>15 Oct</b>	<b>15 Nov</b>
<b>System – WEST:</b>													
Ungrazed	456.4	1233.7		2032.0		2015.0	2205.4	1889.2	1653.4	1598.0			
Grazed		1233.7		837.1		1031.8	1250.2	1673.9	912.4	967.6			
<b>System – EAST:</b>													
Ungrazed	562.9	1611.9		1467.8		1617.7	1770.6	1420.5	1212.8	1553.9			
Grazed		1611.9		834.1		763.2	1147.4	1033.2	1030.4	1087.2			

**Table 4. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 1</b>													
<b>Site – Clayey</b>													
<b>Ungrazed:</b>													
Cool Short				240.8		327.2	292.6	226.6	198.0	440.7			
Warm Short				306.9		183.0	349.7	458.5	328.3	626.2			
Cool Mid				180.2		145.2	146.3	226.6	273.0	210.5			
Western Wheatgrass				255.1		352.2	512.0	686.8	813.5	310.4			
Warm Mid				5.4		0.0	0.0	0.0	0.0	12.5			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				21.4		23.9	37.5	110.6	12.5	17.8			
Grass Total				1009.7		1031.5	1338.0	1709.1	1625.2	1618.1		2604.6	
Forbs				78.5		163.0	182.0	87.4	73.1	126.7		108.8	
Shrubs													
<b>Total</b>				1088.2		1194.6	1520.0	1796.5	1698.4	1744.8		2713.5	
<b>Grazed:</b>													
Cool Short						327.2	238.0	123.8	47.5	147.4			
Warm Mid						183.0	505.6	375.7	463.8	417.5			
Cool Mid						145.2	118.8	225.9	123.8	193.7			
Western Wheatgrass						352.2	466.3	286.5	384.3	330.8			
Warm Mid						0.0	4.6	0.0	0.0	50.0			
Warm Tall						0.0	0.0	0.0	0.0	0.0			
Sedge						23.9	32.1	16.8	0.0	18.9			
Grass Total						1031.5	1365.5	1028.7	1019.4	1158.2		1505.7	
Forbs						163.1	164.1	96.3	111.7	88.1		58.9	
Shrubs													
<b>Total</b>						1194.6	1529.6	1125.0	1131.1	1246.3		1564.6	

**Table 5. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 1</b>													
<b>Site – Sandy</b>													
<b>Ungrazed:</b>													
Cool Short				39.3		148.8	133.8	16.1	0.0	30.3			
Warm Short				76.7		59.6	35.7	198.0	187.3	130.2			
Cool Mid				374.6		478.1	410.3	497.7	513.8	312.2			
Western Wheatgrass				26.8		10.7	16.1	16.1	0.0	7.1			
Warm Mid				5.4		0.0	0.0	0.0	0.0	0.0			
Warm Tall				0.0		315.1	567.3	638.7	656.5	351.5			
Sedge				529.9		397.1	544.1	456.7	553.0	399.6			
Grass Total				1052.5		1409.4	1707.3	1823.3	1910.6	1230.9		2501.1	
Forbs				460.3		209.4	130.2	230.1	226.6	171.3		50.0	
Shrubs													
<b>Total</b>				1512.8		1618.8	1837.5	2053.4	2137.2	1402.2		2551.1	
<b>Grazed:</b>													
Cool Short						148.8	8.2	107.0	11.8	3.6			
Warm Short						59.6	83.1	91.7	47.5	86.7			
Cool Short						478.1	290.1	234.4	248.7	682.6			
Western Wheatgrass						10.7	11.8	13.2	221.2	0.0			
Warm Mid						0.0	0.0	0.0	0.0	0.0			
Warm Tall						315.1	485.3	453.1	438.9	391.4			
Sedge						397.1	346.1	481.7	413.9	310.4			
Grass Total						1409.4	1224.5	1381.2	1381.9	1474.7		2276.4	
Forbs						209.4	295.0	246.2	221.2	150.9		101.7	
Shrubs													
<b>Total</b>						1618.8	1519.5	1627.4	1603.1	1625.6		2378.1	

**Table 6. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 1</b>													
<b>Site – Shallow</b>													
<b>Ungrazed:</b>													
Cool Short				280.1		231.9	73.1	251.1	103.5	246.2			
Warm Short				57.1		39.3	121.3	46.4	91.0	39.3			
Cool Mid				140.9		197.3	146.3	198.0	339.0	173.1			
Western Wheatgrass				0.0		0.0	0.0	0.0	1.8	0.0			
Warm Mid				10.7		0.0	112.4	126.7	103.5	173.1			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				331.8		286.5	296.1	103.5	153.4	189.1			
Grass Total				820.7		755.0	749.2	729.7	792.0	820.7		897.4	
Forbs				76.7		331.8	215.9	219.4	116.0	140.9		41.0	
Shrubs												8.9	
<b>Total</b>				897.4		1086.8	965.1	949.1	908.0	961.6		947.3	
<b>Grazed:</b>													
Cool Short						231.9	211.6	126.0	161.6	188.0			
Warm short						39.3	164.1	56.0	115.3	146.3			
Cool Mid						197.3	190.2	241.6	128.5	139.2			
Western Wheatgrass						0.0	70.3	1.1	4.6	0.0			
Warm Mid						0.0	42.8	90.3	77.4	77.4			
Warm Tall						0.0	0.0	0.0	0.0	0.0			
Sedge						286.5	229.4	109.5	98.8	77.4			
Grass Total						755.0	908.4	624.4	586.3	628.4		370.0	
Forbs						331.8	132.0	109.5	96.3	120.2		22.5	
Shrubs												7.1	
<b>Total</b>						1086.8	1040.4	733.9	682.6	748.6		399.6	



**Table 7. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 1</b>													
<b>Site – Silty</b>													
<b>Ungrazed:</b>													
Cool Short				44.6		290.1	0.0	107.0	139.2	41.0			
Warm Short				137.4		186.6	437.1	617.3	790.3	772.5			
Cool Mid				324.7		450.6	590.5	415.7	135.6	67.8			
Western Wheatgrass				624.4		523.4	592.3	285.4	412.1	538.8			
Warm Mid				0.0		0.0	0.0	0.0	0.0	0.0			
Warm Tall				121.3		0.0	41.0	0.0	0.0	0.0			
Sedge				103.5		96.3	315.8	198.0	64.2	96.3			
Grass Total				1355.9		1547.1	1976.6	1623.4	1541.3	1516.4		2856.2	
Forbs				174.8		139.2	305.1	183.8	94.6	144.5		162.3	
Shrubs													
<b>Total</b>				1530.7		1686.3	2281.7	1807.2	1635.9	1660.9		3018.5	
<b>Grazed:</b>													
Cool Short						290.1	38.2	0.0	265.1	222.3			
Warm Short						186.6	556.6	279.4	637.6	289.0			
Cool Mid						450.6	360.4	684.0	196.2	578.0			
Western Wheatgrass						523.4	382.9	537.7	415.0	634.0			
Warm Mid						0.0	0.0	53.5	0.0	1.1			
Warm Tall						0.0	0.0	0.0	0.0	0.0			
Sedge						96.3	119.5	85.6	102.4	205.9			
Grass Total						1547.1	1457.5	1640.2	1616.3	1930.2		1609.2	
Forbs						139.2	116.0	121.3	65.3	141.7		56.0	
Shrubs													
<b>Total</b>						1686.3	1573.5	1761.5	1681.6	2071.9		1665.2	

**Table 8. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 2</b>													
<b>Site – Clayey</b>													
<b>Ungrazed:</b>													
Cool Short				50.0		77.4	199.8	55.3	3.6	80.3			
Warm Short				167.7		166.6	157.0	371.1	317.6	579.8			
Cool Mid				274.7		216.6	378.2	187.3	190.9	114.2			
Western Wheatgrass				547.7		553.0	504.9	388.9	478.1	686.8			
Warm Mid				0.0		0.0	1.8	0.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				60.7		29.6	149.9	123.1	1.8	0.0			
Grass Total				1100.8		1043.3	1391.6	1125.7	991.9	1461.1		1807.2	
Forbs				431.7		339.0	340.7	585.2	520.9	212.3		189.1	
Shrubs													
<b>Total</b>				1532.5		1382.3	1732.3	1710.9	1512.8	1673.4		1996.3	
<b>Grazed:</b>													
Cool Short						77.4	98.8	154.5	120.2	14.3			
Warm Short						166.6	349.7	225.9	295.1	374.6			
Cool Mid						216.6	208.0	260.5	422.1	312.9			
Western Wheatgrass						553.0	614.8	469.9	238.0	434.2			
Warm Mid						0.0	0.0	0.0	0.0	0.0			
Warm Tall						0.0	0.0	0.0	0.0	0.0			
Sedge						29.6	41.0	46.4	42.8	16.8			
Grass Total						1043.3	1312.3	1157.1	1118.2	1152.8		1778.7	
Forbs						339.0	390.7	657.6	342.5	221.2		123.1	
Shrubs													
<b>Total</b>						1382.3	1703.0	1814.7	1460.7	1374.0		1901.8	

**Table 9. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System - EAST</b>													
<b>Pasture – 2</b>													
<b>Site – Sandy</b>													
<b>Ungrazed:</b>													
Cool Short				82.1		99.9	157.0	42.8	155.2	78.5			
Warm Short				74.9		110.6	87.4	248.0	67.8	83.9			
Cool Mid				190.9		184.5	228.4	476.3	471.0	208.7			
Western Wheatgrass				0.0		0.0	5.4	0.0	8.9	0.0			
Warm Mid				0.0		10.7	5.4	0.0	0.0	0.0			
Warm Tall				117.7		0.0	351.5	160.6	0.0	731.4			
Sedge				524.5		375.7	446.0	294.4	547.7	289.0			
Grass Total				990.2		781.4	1280.9	1222.1	1250.6	1391.5		1619.9	
Forbs				74.9		245.1	183.8	167.7	64.2	25.0		203.4	
Shrubs													
<b>Total</b>				1065.1		1026.5	1464.7	1389.8	1314.8	1416.5		1823.3	
<b>Grazed:</b>													
Cool Short						99.9	202.3	165.2	157.0	93.8			
Warm Short						110.6	108.1	155.9	59.6	131.0			
Cool Mid						184.5	281.9	410.3	141.7	221.2			
Western Wheatgrass						0.0	0.0	0.0	0.0	0.0			
Warm Mid						10.7	32.1	2.5	0.0	0.0			
Warm Tall						0.0	221.2	40.3	332.9	135.6			
Sedge						375.7	383.0	664.7	472.1	472.1			
Grass Total						781.4	1228.6	1439.0	1163.1	1053.7		1200.6	
Forbs						245.1	81.0	186.6	52.5	21.4		98.1	
Shrubs													
<b>Total</b>						1026.5	1309.6	1625.6	1215.6	1075.1		1298.8	

**Table 10. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 2</b>													
<b>Site – Shallow</b>													
<b>Ungrazed:</b>													
Cool Short				303.3		272.2	299.7	444.2	281.9	221.2			
Warm Short				55.3		79.6	92.8	148.1	58.9	92.8			
Cool Mid				210.5		226.6	562.0	506.7	344.3	397.8			
Western Wheatgrass				0.0		6.1	57.1	0.0	0.0	1.8			
Warm Mid				0.0		0.0	3.6	3.6	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				221.2		243.7	317.6	210.5	158.8	87.4			
Grass Total				790.4		828.1	1332.7	1313.0	843.8	801.0		1038.3	
Forbs				162.3		124.9	123.1	192.7	260.5	321.1		103.5	
Shrubs													
<b>Total</b>				952.7		953.0	1455.8	1505.7	1104.3	1122.1		1141.8	
<b>Grazed:</b>													
Cool Short						272.2	366.4	245.1	191.6	210.5			
Warm Short						79.6	72.4	142.7	113.1	171.3			
Cool Mid						226.6	265.1	471.0	352.2	340.0			
Western Wheatgrass						6.1	6.1	27.5	0.0	0.0			
Warm Mid						0.0	0.0	0.0	0.0	0.0			
Warm Tall						0.0	0.0	0.0	0.0	0.0			
Sedge						243.7	253.3	163.1	116.7	184.5			
Grass Total						828.1	963.4	1049.3	773.6	906.2		827.8	
Forbs						124.9	293.8	339.0	186.6	179.5		178.4	
Shrubs													
<b>Total</b>						953.0	1257.2	1388.3	960.2	1085.7		1006.2	

**Table 11. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 2</b>													
<b>Site – Silty</b>													
<b>Ungrazed:</b>													
Cool Short				3.6		26.1	33.9	57.1	41.0	76.7			
Warm short				363.9		231.9	237.3	376.4	694.0	706.5			
Cool Mid				94.6		252.3	246.7	356.8	128.5	209.9			
Western Wheatgrass				421.0		356.8	431.7	531.6	581.6	592.3			
Warm Mid				5.4		0.0	108.8	0.0	0.0	0.0			
Warm Tall				0.0		91.0	0.0	0.0	0.0	0.0			
Sedge				153.4		256.9	260.5	69.6	85.6	23.2			
Grass Total				1041.8		1214.9	1318.3	1391.5	1528.7	1605.6		1873.2	
Forbs				112.4		154.6	405.0	221.2	201.6	167.7		196.2	
Shrubs													
<b>Total</b>				1154.2		1369.5	1723.3	1612.7	1730.3	1773.3		2069.4	
<b>Grazed:</b>													
Cool Short						26.1	153.4	0.0	43.9	147.4			
Warm Short						231.9	430.7	397.8	409.3	695.8			
Cool Mid						252.3	243.7	193.7	337.9	332.9			
Western Wheatgrass						356.8	361.4	1056.1	304.4	310.4			
Warm Mid						0.0	0.0	0.0	0.0	4.6			
Warm Tall						91.0	0.0	0.0	0.0	0.0			
Sedge						256.9	327.1	271.2	229.4	77.4			
Grass Total						1214.9	1516.3	1918.9	1324.8	1568.5		1243.5	
Forbs						154.6	90.4	177.3	139.2	299.7		183.8	
Shrubs													
<b>Total</b>						1369.5	1606.7	2096.2	1464.0	1868.2		1427.2	

**Table 12. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 3</b>													
<b>Site – Clayey</b>													
<b>Ungrazed:</b>													
Cool Short				212.3		198.0	162.3	196.2	153.4	305.1			
Warm Short				112.4		171.3	255.1	265.8	128.5	444.2			
Cool Mid				53.5		149.9	76.7	105.3	130.2	89.2			
Western Wheatgrass				253.3		246.9	314.0	174.8	53.5	185.5			
Warm Mid				0.0		0.0	0.0	33.9	69.6	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				69.6		98.1	110.6	98.1	1.8	3.6			
Grass Total				701.1		863.4	918.7	929.5	537.0	1027.6		1097.2	
Forbs				110.6		315.8	201.6	256.9	342.5	28.5		44.6	
Shrubs													
<b>Total</b>				811.7		1179.2	1120.3	1131.1	879.5	1056.1		1141.8	
<b>Grazed:</b>													
Cool Short				212.3		70.3	218.7	147.4	177.3	99.9			
Warm Short				112.4		183.0	263.0	443.5	222.3	359.3			
Cool Mid				53.5		124.9	128.5	70.3	143.8	214.1			
Western Wheatgrass				253.3		142.7	109.5	188.0	243.7	222.3			
Warm Mid				0.0		0.0	20.3	0.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				69.6		114.2	39.3	107.0	17.8	35.7			
Grass Total				701.1		635.2	779.3	956.3	804.9	931.3		790.4	
Forbs				110.6		298.6	319.9	350.7	243.7	359.3		5.4	
Shrubs													
<b>Total</b>				811.7		933.8	1099.2	1307.0	1048.6	1290.6		795.7	

**Table 13. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 3</b>													
<b>Site – Sandy</b>													
<b>Ungrazed:</b>													
Cool Short				171.3		137.4	189.1	182.0	230.1	265.8			
Warm Short				110.6		58.9	64.2	224.8	151.6	344.3			
Cool Mid				135.6		385.3	415.7	403.2	264.0	146.3			
Western Wheatgrass				73.1		21.4	0.0	58.9	33.9	25.0			
Warm Mid				17.8		0.0	7.1	0.0	0.0	0.0			
Warm Tall				0.0		94.6	146.3	0.0	130.2	0.0			
Sedge				745.7		517.4	390.7	397.8	249.8	248.0			
Grass Total				1254.1		1214.9	1213.1	1266.7	1059.7	1029.4		1471.8	
Forbs				158.8		132.0	103.5	297.9	267.6	169.5		237.3	
Shrubs													
<b>Total</b>				1412.9		1346.9	1316.6	1564.6	1327.3	1198.9		1709.1	
<b>Grazed:</b>													
Cool Short				171.3		124.9	163.1	72.4	180.9	143.8			
Warm Short				110.6		180.9	192.7	242.6	147.4	106.0			
Cool Mid				135.6		208.0	342.5	231.9	117.7	353.2			
Western Wheatgrass				73.1		98.8	29.6	23.9	21.4	1.1			
Warm Mid				17.8		0.0	0.0	3.6	0.0	0.0			
Warm Tall				0.0		14.3	131.0	267.6	204.5	131.0			
Sedge				745.7		365.0	471.0	404.3	385.3	202.3			
Grass Total				1254.1		991.9	1329.8	1246.3	1057.2	937.3		1409.4	
Forbs				158.8		327.2	126.0	72.4	227.3	95.3		137.4	
Shrubs													
<b>Total</b>				1412.9		1319.1	1455.8	1318.7	1284.5	1032.6		1546.7	

**Table 14. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 3</b>													
<b>Site – Shallow</b>													
<b>Ungrazed:</b>													
Cool Short				271.2		303.3	248.0	328.3	182.0	315.8			
Warm Short				169.5		96.3	135.6	124.9	155.2	180.2			
Cool Mid				424.6		367.5	301.5	328.3	317.6	435.3			
Western Wheatgrass				51.7		37.5	42.8	26.8	10.7	0.0			
Warm Mid				50.0		0.0	0.0	0.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				349.7		428.2	314.0	133.8	496.0	160.6			
Grass Total				1316.6		1232.7	1041.9	942.0	1161.4	1091.8		956.2	
Forbs				169.5		157.0	107.0	363.9	42.8	182.0		151.6	
Shrubs													
<b>Total</b>				1486.1		1389.7	1148.9	1305.9	1204.2	1273.8		1107.9	
<b>Grazed:</b>													
Cool Short				271.2		312.9	281.9	224.8	108.1	234.4			
Warm Short				169.5		126.0	98.8	190.2	215.2	174.8			
Cool Mid				424.6		247.3	285.4	367.5	168.8	309.4			
Western Wheatgrass				51.7		123.8	46.4	73.9	106.0	84.6			
Warm Mid				50.0		0.0	15.3	0.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				349.7		254.4	390.1	381.8	443.5	278.3			
Grass Total				1316.6		1064.3	1117.9	1238.1	1041.5	1081.5		1077.5	
Forbs				169.5		106.0	293.8	182.0	121.3	238.0		108.8	
Shrubs													
<b>Total</b>				1486.1		1170.3	1411.7	1420.1	1162.8	1319.5		1186.4	



**Table 15. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 3</b>													
<b>Site – Silty</b>													
<b>Ungrazed:</b>													
Cool Short				8.9		3.6	1.8	0.0	0.0	331.8			
Warm Short				235.5		167.7	415.7	572.7	199.8	0.0			
Cool Mid				388.9		428.2	710.0	551.3	563.7	654.7			
Western Wheatgrass				169.5		114.2	490.6	1229.2	438.9	155.2			
Warm Mid				0.0		0.0	0.0	0.0	0.0	0.0			
Warm Tall				0.0		677.9	0.0	0.0	0.0	490.6			
Sedge				221.2		8.9	99.9	48.2	87.4	30.3			
Grass Total				1024.0		1400.5	1717.9	2401.2	1289.9	1662.7		1759.0	
Forbs				182.0		87.4	239.1	48.2	41.0	25.0		137.4	
Shrubs													
<b>Total</b>				1206.0		1487.9	1957.0	2449.4	1330.9	1687.7		1896.4	
<b>Grazed:</b>													
Cool Short				8.9		28.5	0.0	163.1	22.5	33.2			
Warm Short				235.5		291.5	497.0	430.7	323.6	234.4			
Cool Mid				388.9		224.8	129.5	575.5	331.8	541.3			
Western Wheatgrass				169.5		548.4	494.9	397.2	652.9	390.0			
Warm Mid				0.0		1.1	2.5	0.0	0.0	36.8			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				221.2		36.8	51.1	53.5	1.1	57.1			
Grass Total				1024.0		1131.1	1175.1	1620.0	1332.0	1292.7		1289.9	
Forbs				182.0		183.0	77.3	117.7	117.7	202.3		17.8	
Shrubs													
<b>Total</b>				1206.0		1314.1	1252.4	1737.7	1449.7	1495.0		1307.7	

**Table 16. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 4</b>													
<b>Site – Clayey</b>													
<b>Ungrazed:</b>													
Cool Short				274.7		456.7	226.6	160.6	335.4	144.5			
Warm Short				144.5		137.4	201.6	123.1	380.0	108.8			
Cool Mid				121.3		96.3	219.4	153.4	96.3	146.3			
Western Wheatgrass				64.2		62.4	32.1	14.3	64.2	16.1			
Warm Mid				23.2		0.0	96.3	185.5	0.0	308.6			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				192.7		60.7	96.3	123.1	41.0	44.6			
Grass Total				820.6		813.5	872.3	759.6	917.0	769.0		911.7	
Forbs				294.4		137.4	619.1	694.4	153.4	478.0		164.1	
Shrubs													
<b>Total</b>				1115.0		950.9	1491.4	1454.0	1070.4	1247.0		1075.8	
<b>Grazed:</b>													
Cool Short				274.7		133.1	115.3	264.0	202.3	189.1			
Warm Short				144.5		255.8	157.0	482.8	140.2	248.7			
Cool Mid				121.3		60.7	45.3	47.5	126.0	128.5			
Western Wheatgrass				64.2		141.7	27.5	56.0	36.8	20.3			
Warm Mid				23.2		6.1	43.9	0.0	4.6	196.2			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				192.7		23.9	73.9	32.1	45.3	41.8			
Grass Total				820.6		621.3	462.8	882.4	555.2	824.6		456.7	
Forbs				294.4		282.9	412.8	312.9	205.9	174.8		57.1	
Shrubs													
<b>Total</b>				1115.0		904.2	875.6	1195.3	761.1	999.4		513.8	

**Table 17. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 4</b>													
<b>Site – Sandy</b>													
<b>Ungrazed:</b>													
Cool Short				130.2		92.8	3.6	39.3	0.0	231.9			
Warm short				158.8		133.8	251.5	155.2	164.1	347.9			
Cool Mid				235.5		39.3	148.1	231.9	183.8	183.8			
Western Wheatgrass				0.0		0.0	80.3	135.6	58.9	0.0			
Warm Mid				0.0		101.7	0.0	0.0	0.0	17.8			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				515.6		178.4	463.8	353.2	271.2	123.1			
Grass Total				1040.1		545.9	947.3	915.2	677.9	904.5		1022.2	
Forbs				196.2		406.8	139.2	164.1	217.7	281.9		69.6	
Shrubs													
<b>Total</b>				1236.3		952.7	1086.5	1079.3	895.6	1186.4		1091.8	
<b>Grazed:</b>													
Cool Short				130.2		68.9	133.1	89.2	63.2	13.2			
Warm Short				158.8		145.2	250.8	202.3	188.0	183.0			
Cool Mid				235.5		245.1	295.1	261.5	200.9	327.2			
Western Wheatgrass				0.0		0.0	13.2	0.0	40.3	0.0			
Warm Mid				0.0		0.0	36.1	76.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				515.6		509.2	255.8	265.1	299.7	337.9			
Grass Total				1040.1		968.3	984.8	894.2	792.0	861.3		786.7	
Forbs				196.2		163.1	102.4	109.5	136.7	146.3		169.5	
Shrubs													
<b>Total</b>				1236.3		1131.4	1087.2	1003.7	928.7	1007.6		956.2	

**Table 18. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 4</b>													
<b>Site – Shallow</b>													
<b>Ungrazed:</b>													
Cool Short				21.4		0.0	91.0	5.4	32.1	0.0			
Warm Short				171.3		121.3	105.3	248.0	23.2	262.3			
Cool Mid				110.6		178.4	128.5	155.2	237.3	94.6			
Western Wheatgrass				19.6		0.0	0.0	0.0	0.0	0.0			
Warm Mid				0.0		0.0	7.1	0.0	53.5	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				537.0		417.5	408.5	249.8	280.1	271.2			
Grass Total				859.9		717.2	740.4	658.3	626.2	628.0		374.6	
Forbs				73.1		87.4	110.6	69.6	176.6	114.2		25.0	
Shrubs													
<b>Total</b>				933.0		804.6	851.0	727.9	802.8	742.2		399.6	
<b>Grazed:</b>													
Cool Short				21.4		71.4	21.4	0.0	25.0	0.0			
Warm Short				171.3		93.8	183.0	150.9	158.1	148.8			
Cool Mid				110.6		190.2	191.6	145.2	230.9	150.9			
Western Wheatgrass				19.6		0.0	1.1	0.0	0.0	0.0			
Warm Mid				0.0		1.1	20.3	16.8	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				537.0		654.0	556.6	233.0	405.7	292.6			
Grass Total				859.9		1010.4	938.1	545.9	819.5	592.3		196.2	
Forbs				73.1		38.2	110.6	123.8	73.9	96.3		258.7	
Shrubs													
<b>Total</b>				933.0		1048.6	1084.7	669.7	893.4	688.6		454.9	

**Table 19. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 4</b>													
<b>Site – Silty</b>													
<b>Ungrazed:</b>													
Cool Short				237.3		226.6	144.5	148.1	69.6	153.4			
Warm Short				267.6		397.8	273.0	258.7	781.4	447.8			
Cool Mid				110.6		67.8	135.6	217.7	55.3	182.0			
Western Wheatgrass				230.1		440.7	349.7	349.7	344.3	237.3			
Warm Mid				0.0		0.0	0.0	0.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				335.4		228.4	223.0	363.9	221.2	239.1			
Grass Total				1181.0		1361.1	1125.7	1338.0	1471.8	1259.5		763.6	
Forbs				146.3		83.9	335.4	383.6	98.1	140.9		251.5	
Shrubs													
<b>Total</b>				1327.3		1445.0	1461.1	1721.6	1569.9	1400.4		1015.1	
<b>Grazed:</b>													
Cool Short				237.3		3.6	115.3	50.0	41.6	59.6			
Warm Short				267.6		362.9	473.5	497.0	437.7	462.8			
Cool Mid				110.6		57.1	204.5	64.2	69.0	51.0			
Western Wheatgrass				230.1		180.9	384.3	554.1	284.3	386.4			
Warm Mid				0.0		0.0	0.0	0.0	0.0	0.0			
Warm Tall				0.0		0.0	0.0	0.0	0.0	0.0			
Sedge				335.4		200.9	297.2	209.4	202.2	221.2			
Grass Total				1181.0		805.3	1474.7	1374.7	1034.8	1181.0		965.2	
Forbs				146.3		53.5	140.2	278.3	42.8	57.1		62.4	
Shrubs													
<b>Total</b>				1327.3		858.8	1614.9	1653.0	1077.6	1238.1		1027.6	

**Table 20. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 5</b>													
<b>Site – Sandy</b>													
<b>Ungrazed:</b>													
Cool Short					330.0	84.4	170.1	52.3	53.5	101.7			
Warm Short					60.7	79.7	85.6	57.1	98.1	94.6			
Cool Mid					408.5	434.1	271.2	453.1	447.8	611.9			
Western Wheatgrass					19.6	0.0	0.0	0.0	0.0	0.0			
Warm Mid					0.0	20.2	126.1	11.9	98.1	0.0			
Warm Tall					264.0	89.2	234.3	327.1	312.2	503.1			
Sedge					271.2	386.5	206.9	455.5	271.2	340.7			
Grass Total					1354.1	1094.2	1094.2	1357.0	1280.9	1652.0		1544.9	
Forbs					105.3	266.4	102.3	63.0	89.2	210.5		128.5	
Shrubs													
<b>Total</b>					1459.4	1360.6	1196.5	1420.0	1370.1	1862.5		1673.4	
<b>Grazed:</b>													
Cool Short								52.3	116.6	51.1			
Warm Short								57.1	61.9	85.6			
Cool Mid								453.1	432.9	173.6			
Western Wheatgrass								0.0	0.0	0.0			
Warm Mid								11.9	0.0	98.7			
Warm Tall								327.1	174.8	295.0			
Sedge								455.5	165.3	315.2			
Grass Total								1357.0	951.5	1019.3		724.3	
Forbs								63.0	158.2	40.4		66.0	
Shrubs													
<b>Total</b>								1420.0	1109.7	1059.7		790.3	

**Table 21. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 5</b>													
<b>Site – Shallow</b>													
<b>Ungrazed:</b>													
Cool Short					328.3	286.6	242.6	335.4	397.8	408.5			
Warm Short					103.5	138.0	141.5	186.7	223.0	110.6			
Cool Mid					53.5	133.2	88.0	53.5	173.1	105.3			
Western Wheatgrass					0.0	1.2	0.0	0.0	0.0	16.1			
Warm Mid					0.0	3.6	17.8	86.8	0.0	50.0			
Warm Tall					0.0	0.0	0.0	0.0	0.0	0.0			
Sedge					255.1	134.4	210.5	160.6	37.5	112.4		462.1	
Grass Total					740.4	697.0	700.5	823.0	831.3	802.8			
Forbs					96.3	258.1	246.2	349.7	240.8	324.7		198.0	
Shrubs													
<b>Total</b>					836.7	955.1	946.7	1172.7	1072.1	1127.5		660.1	
<b>Grazed:</b>													
Cool Short								335.4	139.2	96.3			
Warm Short								186.7	117.7	109.4			
Cool Mid								53.5	146.3	72.6			
Western Wheatgrass								0.0	0.0	0.0			
Warm Mid								86.8	1.2	3.6			
Warm Tall								0.0	0.0	0.0			
Sedge								160.6	204.6	141.5			
Grass Total								823.0	608.9	423.4		422.8	
Forbs								349.7	44.0	143.9		35.7	
Shrubs													
<b>Total</b>								1172.7	652.9	567.3		458.5	

**Table 22. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – WEST</b>													
<b>Pasture – 5</b>													
<b>Site – Silty</b>													
<b>Ungrazed:</b>													
Cool Short					385.3	256.9	239.1	291.4	296.1	174.8			
Warm Short					76.7	231.9	195.1	193.9	296.1	296.1			
Cool Mid					214.1	206.9	277.1	327.1	107.0	203.4			
Western Wheatgrass					296.1	202.2	413.9	273.6	194.5	249.8			
Warm Mid					0.0	0.0	123.7	0.0	0.0	0.0			
Warm Tall					0.0	0.0	0.0	0.0	0.0	0.0			
Sedge					182.0	297.3	172.5	308.0	173.1	173.1			
Grass Total					1154.3	1195.3	1421.3	1393.9	1066.8	1097.2		1377.3	
Forbs					67.8	71.4	120.1	182.0	221.2	146.3		10.7	
Shrubs													
<b>Total</b>					1222.1	1266.7	1541.4	1575.9	1288.0	1243.5		1388.0	
<b>Grazed:</b>													
Cool Short								291.4	127.3	161.8			
Warm Short								193.9	164.1	239.1			
Cool Mid								327.1	178.4	246.2			
Western Wheatgrass								273.6	105.9	84.4			
Warm Mid								0.0	13.1	0.0			
Warm Tall								0.0	0.0	0.0			
Sedge								308.0	248.6	70.2			
Grass Total								1393.9	1094.2	801.6		881.3	
Forbs								182.0	89.2	142.7		7.1	
Shrubs													
<b>Total</b>								1575.9	1196.4	944.3		888.4	



**Table 23. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 6</b>													
<b>Site – Sandy</b>													
<b>Ungrazed:</b>													
Cool Short					28.5	48.8	19.0	0.0	0.0	64.2			
Warm Short					41.0	50.0	48.8	34.5	80.3	89.2			
Cool Mid					83.9	264.0	321.1	94.0	303.3	180.2			
Western Wheatgrass					12.5	3.6	51.1	0.0	0.0	0.0			
Warm Mid					139.2	0.0	0.0	0.0	0.0	0.0			
Warm Tall					0.0	64.2	199.8	485.3	353.2	355.0			
Sedge					560.2	688.6	940.8	1232.2	801.0	603.0			
Grass Total					865.2	1119.2	1580.6	1845.9	1537.8	1291.6		1027.6	
Forbs					633.3	132.0	145.1	180.8	46.4	96.3		73.1	
Shrubs													
<b>Total</b>					1498.5	1251.2	1725.7	2026.7	1584.2	1388.9		1100.7	
<b>Grazed:</b>													
Cool short								0.0	0.0	4.8			
Warm Short								34.5	11.9	72.6			
Cool Mid								94.0	341.3	184.4			
Western Wheatgrass								0.0	7.1	0.0			
Warm Mid								0.0	0.0	0.0			
Warm Tall								485.3	570.9	208.1			
Sedge								1232.2	567.3	723.1			
Grass Total								1845.9	1498.6	1192.9		777.8	
Forbs								180.8	35.7	177.2		165.9	
Shrubs													
<b>Total</b>								2026.7	1534.3	1370.1		943.7	

**Table 24. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	20 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 6</b>													
<b>Site – Shallow</b>													
<b>Ungrazed:</b>													
Cool Short					324.7	242.6	300.9	267.6	369.3	315.8			
Warm Short					173.1	138.0	140.3	130.8	105.3	267.6			
Cool Mid					32.1	85.6	388.9	430.5	228.4	67.8			
Western Wheatgrass					41.0	79.7	103.5	111.8	123.1	116.0			
Warm Mid					0.0	21.4	66.6	85.6	1.8	0.0			
Warm Tall					0.0	0.0	0.0	0.0	0.0	0.0			
Sedge					281.9	182.0	148.7	234.3	108.8	121.3			
Grass Total					852.8	749.3	1148.9	1260.7	936.6	888.4		793.9	
Forbs					333.6	329.5	266.4	279.5	117.7	212.3		3.6	
Shrubs													
<b>Total</b>					1186.4	1078.8	1415.3	1540.2	1054.3	1100.7		797.5	
<b>Grazed:</b>													
Cool Short								267.6	105.9	85.6			
Warm Short								130.8	110.6	103.5			
Cool Mid								430.5	86.8	45.2			
Western Wheatgrass								111.8	161.8	162.9			
Warm Mid								85.6	67.8	21.4			
Warm Tall								0.0	0.0	0.0			
Sedge								234.3	88.0	59.5			
Grass Total								1260.7	620.8	478.1		544.1	
Forbs								279.5	34.5	91.6		57.1	
Shrubs													
<b>Total</b>								1540.2	655.3	569.7		601.2	

**Table 25. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System – EAST</b>													
<b>Pasture – 6</b>													
<b>Site – Silty</b>													
<b>Ungrazed:</b>													
Cool Short					289.0	293.8	98.7	171.3	142.7	192.7			
Warm Short					148.1	183.2	293.8	385.3	157.0	346.1			
Cool Mid					1022.2	536.4	541.2	675.5	396.1	296.1			
Western Wheatgrass					103.5	322.3	393.7	319.9	513.8	206.9			
Warm Mid					0.0	0.0	0.0	0.0	0.0	0.0			
Warm Tall					0.0	0.0	0.0	39.3	0.0	0.0			
Sedge					190.9	574.5	613.7	132.0	105.3	449.6			
Grass Total					1753.7	1910.1	1941.0	1723.3	1314.8	1491.4		1511.1	
Forbs					278.3	174.8	212.9	134.4	64.2	110.6		35.7	
Shrubs													
<b>Total</b>					2032.0	2084.9	2153.9	1857.7	1379.0	1602.0		1546.8	
<b>Grazed:</b>													
Cool Short								171.3	54.7	63.0			
Warm Short								385.3	343.7	184.4			
Cool Mid								675.5	195.1	454.3			
Western Wheatgrass								319.9	299.7	209.3			
Warm Mid								0.0	0.0	0.0			
Warm Tall								39.3	0.0	0.0			
Sedge								132.0	305.7	270.0			
Grass Total								1723.3	1198.9	1181.0		884.9	
Forbs								134.4	117.7	92.8		103.5	
Shrubs													
<b>Total</b>								1857.7	1316.6	1273.8		988.4	

**Table 26. Mean Total above Ground Herbage Production in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System-WEST</b>													
<b>Pasture-1</b>													
<b>Site-Clayey:</b>													
Ungrazed				1088.2		1194.6	1520.0	1796.5	1698.4	1744.8			2713.5
Grazed						1194.6	1529.6	1125.0	1131.1	1246.3			1564.6
<b>Site-Sandy:</b>													
Ungrazed				1512.8		1618.8	1837.5	2053.4	2137.2	1402.2			2551.1
Grazed						1618.8	1519.5	1627.4	1603.1	1625.6			2378.1
<b>Site-Shallow:</b>													
Ungrazed				897.4		1086.8	965.1	949.1	908.0	961.6			947.3
Grazed						1086.8	1040.4	733.9	682.6	748.6			399.6
<b>Site-Silty:</b>													
Ungrazed				1530.7		1686.3	2281.7	1807.2	1635.9	1660.9			3018.5
Grazed						1686.3	1573.5	1761.5	1681.6	2071.9			1665.2
<b>System-EAST</b>													
<b>Pasture-2</b>													
<b>Site-Clayey:</b>													
Ungrazed				1532.5		1382.3	1732.3	1710.9	1512.8	1673.4			1996.3
Grazed						1382.3	1703.0	1814.7	1460.7	1374.0			1901.8
<b>Site-Sandy:</b>													
Ungrazed				1065.1		1026.5	1464.7	1389.8	1314.8	1416.5			1823.3
Grazed						1026.5	1309.6	1625.6	1215.6	1075.1			1298.8
<b>Site-Shallow:</b>													
Ungrazed				952.7		953.0	1455.8	1505.7	1104.3	1122.1			1141.8
Grazed						953.0	1257.2	1388.3	960.2	1085.7			1006.2
<b>Site-Silty:</b>													
Ungrazed				1154.2		1369.5	1723.3	1612.7	1730.3	1773.3			2069.4
Grazed						1369.5	1606.7	2096.2	1464.0	1868.2			1427.2

**Table 27. Mean Total above Ground Herbage Production in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System-WEST</b>													
<b>Pasture-3</b>													
<b>Site-Clayey:</b>													
Ungrazed				811.7		1179.2	1120.3	1131.1	879.5	1056.1			1141.8
Grazed				811.7		933.8	1099.2	1307.0	1048.6	1290.6			795.7
<b>Site-Sandy:</b>													
Ungrazed				1412.9		1346.9	1316.6	1564.6	1327.3	1198.9			1709.1
Grazed				1412.9		1319.1	1455.8	1318.7	1284.5	1032.6			1546.7
<b>Site-Shallow:</b>													
Ungrazed				1486.1		1389.7	1148.9	1305.9	1204.2	1273.8			1107.9
Grazed				1486.1		1170.3	1411.7	1420.1	1162.8	1319.5			1186.4
<b>Site-Silty:</b>													
Ungrazed				1206.0		1487.9	1957.0	2449.4	1330.9	1687.7			1896.4
Grazed				1206.0		1314.1	1252.4	1737.7	1449.7	1495.0			1307.7
<b>System-EAST</b>													
<b>Pasture-4</b>													
<b>Site-Clayey:</b>													
Ungrazed				1115.0		950.9	1491.4	1454.0	1070.4	1247.0			1075.8
Grazed				1115.0		904.2	875.6	1195.3	761.1	999.4			513.8
<b>Site-Sandy:</b>													
Ungrazed				1236.3		952.7	1086.5	1079.3	895.6	1186.4			1091.8
Grazed				1236.3		1131.4	1087.2	1003.7	928.7	1007.6			956.2
<b>Site-Shallow:</b>													
Ungrazed				933.0		804.6	851.0	727.9	802.8	742.2			399.6
Grazed				933.0		1048.6	1084.7	669.7	893.4	688.6			454.9
<b>Site-Silty:</b>													
Ungrazed				1327.3		1445.0	1461.1	1721.6	1569.9	1400.4			1015.1
Grazed				1327.3		858.8	1614.9	1653.0	1077.6	1238.1			1027.6

**Table 28. Mean Total above Ground Herbage Production in Lbs/Acre for the Native Range on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System-WEST</b>													
<b>Pasture-5</b>													
<b>Site-Clayey:</b>													
Ungrazed													
Grazed													
<b>Site-Sandy:</b>													
Ungrazed					1459.4	1360.6	1196.5	1420.0	1370.1	1862.5		1673.4	
Grazed								1420.0	1109.7	1059.7		790.3	
<b>Site-Shallow:</b>													
Ungrazed					836.7	955.1	946.7	1172.7	1072.1	1127.5		660.1	
Grazed								1172.7	652.9	567.3		458.5	
<b>Site-Silty:</b>													
Ungrazed					1222.1	1266.7	1541.4	1575.9	1288.0	1243.5		1388.0	
Grazed								1575.9	1196.4	944.3		888.4	
<b>System-EAST</b>													
<b>Pasture-6</b>													
<b>Site-Clayey:</b>													
Ungrazed													
Grazed													
<b>Site-Sandy:</b>													
Ungrazed					1498.5	1251.2	1725.7	2026.7	1584.2	1388.9		1100.7	
Grazed								2026.7	1534.3	1370.1		943.7	
<b>Site-Shallow:</b>													
Ungrazed					1186.4	1078.8	1415.3	1540.2	1054.3	1100.7		797.5	
Grazed								1540.2	655.3	569.7		601.2	
<b>Site-Silty:</b>													
Ungrazed					2032.0	2084.9	2153.9	1857.7	1379.0	1602.0		1546.8	
Grazed								1857.7	1316.6	1273.8		988.4	

**Table 29. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Altai Wildrye on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	25 Apr	10 May	25 May	10 Jun	25 Jun	5 Jul	20 Jul	1 Aug	15 Aug	30 Aug	15 Sep	15 Oct	15 Nov
<b>System-WEST</b>													
<b>Ungrazed:</b>													
Altai Wildrye				595.1		927.0	759.3	595.9	953.4	665.1		1289.2	
Other Grasses				26.8		371.8	699.3	1162.5	1270.2	1219.5		727.9	
Grass Total				621.9		1298.8	1458.6	1758.4	2223.6	1884.6		2017.1	
Forbs				376.1		94.2	170.6	309.7	308.3	231.2		894.5	
Shrubs													
<b>Total</b>				998.0		1393.0	1629.2	2068.0	2531.9	2115.8		2911.5	
<b>Grazed:</b>													
Altai Wildrye												1289.2	805.2
Other Grasses												727.9	481.7
Grass Total												2017.1	1286.9
Forbs												894.5	271.2
Shrubs													
<b>Total</b>												2911.5	1558.0

**Table 30. Mean Above Ground Herbage Production by Category in Lbs/Acre for the Altai Wildrye on the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

	<b>25 Apr</b>	<b>10 May</b>	<b>25 May</b>	<b>10 Jun</b>	<b>25 Jun</b>	<b>5 Jul</b>	<b>20 Jul</b>	<b>1 Aug</b>	<b>15 Aug</b>	<b>30 Aug</b>	<b>15 Sep</b>	<b>15 Oct</b>	<b>15 Nov</b>
<b>System-EAST</b>													
<b>Ungrazed:</b>													
Altai Wildrye				642.2		1158.9	1268.1	1136.8	577.3	555.9		2463.0	
Other Grasses				25.7		113.5	545.2	724.3	942.7	1305.2		557.7	
Grass Total				667.9		1272.4	1813.3	1861.1	1520.0	1861.1		3020.7	
Forbs				132.0		225.5	17.1	214.1	889.2	254.8		882.4	
Shrubs													
<b>Total</b>				799.9		1497.9	1830.4	2075.2	2409.1	2115.8		3903.0	
<b>Grazed:</b>													
Altai Wildrye												2463.0	1616.3
Other Grasses												557.7	581.6
Grass Total												3020.7	2197.9
Forbs												882.4	217.7
Shrubs													
<b>Total</b>												3903.0	2415.5



**Table 31. Mean Total above Ground Herbage Production in Lbs/Acre for the Altai Wildrye on the Complementary Grazing System at the Dickinson Experiment Station, 1983**

	<b>25 Apr</b>	<b>10 May</b>	<b>25 May</b>	<b>10 Jun</b>	<b>25 Jun</b>	<b>5 Jul</b>	<b>20 Jul</b>	<b>1 Aug</b>	<b>15 Aug</b>	<b>30 Aug</b>	<b>15 Sep</b>	<b>15 Oct</b>	<b>15 Nov</b>
<b>System-WEST:</b>													
Ungrazed				998.0		1393.0	1629.2	2068.0	2531.9	2115.8		2911.5	
Grazed												2911.5	1558.0
<b>System-EAST:</b>													
Ungrazed				799.9		1497.9	1830.4	2075.2	2409.1	2115.8		3903.0	
Grazed												3903.0	2415.5

**Table 32. Points Analysis on the Crested Wheatgrass, West Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron desertorum	29.40	80.33	98.00	70.50	150.83
Bouteloua gracilis	5.10	13.93	24.00	17.27	31.20
Koeleria pyramidata	0.30	0.82	2.00	1.44	2.26
Schedonnardus paniculatus	0.30	0.82	3.00	2.16	2.98
Stipa comata	0.60	1.64	4.00	2.88	4.52
Hedeoma hispida	0.50	1.37	4.00	2.88	4.25
Plantago purshii	0.20	0.55	2.00	1.44	1.99
Selaginella densa	0.10	0.27	1.00	0.72	0.99
Lichen spp.	0.10	0.27	1.00	0.72	0.99
Litter	55.70		99.00		
Soil	7.70		3.90		
Rock	0.00		0.00		

**Table 33. Points Analysis on the Crested Wheatgrass, East Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron desertorum	25.90	79.20	94.00	66.20	145.40
Agropyron smithii	0.10	0.31	1.00	0.70	1.01
Bouteloua gracilis	3.20	9.79	14.00	9.86	19.65
Koeleria pyramidata	0.90	2.75	7.00	4.93	7.68
Poa compressa	0.20	0.61	2.00	1.41	2.02
Stipa comata	0.70	2.14	7.00	4.93	7.07
Stipa viridula	0.30	0.92	3.00	2.11	3.03
Hedeoma hispida	0.20	0.61	2.00	1.41	2.02
Lygodesmia juncea	0.10	0.31	1.00	0.70	1.01
Penstemon albidus	0.10	0.31	1.00	0.70	1.01
Plantago purshii	0.10	0.31	1.00	0.70	1.01
Potentilla pensylvanica	0.20	0.61	2.00	1.41	2.02
Taraxacum officinale	0.20	0.61	2.00	1.41	2.02
Selaginella densa	0.30	0.92	3.00	2.11	3.03
Lichen spp.	0.20	0.61	2.00	1.41	2.02
Litter	59.10		99.00		
Soil	8.20		31.00		
Rock	0.00		0.00		

**Table 34. Points Analysis of the Clayey Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	11.00	13.14	66.00	17.14	30.28
<i>Bouteloua gracilis</i>	43.70	52.21	98.00	25.45	77.66
<i>Buchloe dactyloides</i>	2.00	2.39	8.00	2.08	4.47
<i>Calamagrostis montanensis</i>	0.50	0.60	4.00	1.04	1.64
<i>Koeleria pyramidata</i>	6.60	7.89	44.00	11.43	19.32
<i>Stipa comata</i>	1.10	1.31	9.00	2.34	3.65
<i>Stipa viridula</i>	4.90	5.85	37.00	9.61	15.46
<i>Carex filifolia</i>	1.00	1.19	9.00	2.34	3.53
<i>Carex heliophila</i>	1.10	1.31	8.00	2.08	3.39
<i>Achillea millefolium</i>	0.80	0.96	8.00	2.08	3.04
<i>Androsace occidentalis</i>	0.20	0.24	2.00	0.52	0.76
<i>Artemisia dracunculul</i>	0.20	0.24	2.00	0.52	0.76
<i>Artemisia frigida</i>	0.90	1.08	9.00	2.34	3.42
<i>Aster ericoides</i>	0.10	0.12	1.00	0.26	0.38
<i>Conyza canadensis</i>	3.40	4.06	24.00	6.23	10.29
<i>Erysimum asperum</i>	0.20	0.24	2.00	0.52	0.76
<i>Grindelia squarrosa</i>	0.60	0.72	6.00	1.56	2.28
<i>Hedeoma hispida</i>	0.70	0.84	6.00	1.56	2.40
<i>Neslia paniculata</i>	0.10	0.12	1.00	0.26	0.38
<i>Opuntia fragilis</i>	0.10	0.12	1.00	0.26	0.38
<i>Orthocarpus luteus</i>	0.10	0.12	1.00	0.26	0.38
<i>Oxytropis lambertii</i>	0.20	0.24	2.00	0.52	0.76
<i>Penstemon albidus</i>	0.30	0.36	2.00	0.52	0.88
<i>Phlox hoodii</i>	0.80	0.96	5.00	1.30	2.26
<i>Polygala alba</i>	0.10	0.12	1.00	0.26	0.38
<i>Potentilla pensylvanica</i>	0.30	0.36	3.00	0.78	1.14
<i>Psoralea argophylla</i>	0.10	0.12	1.00	0.26	0.38
<i>Ratibida columnifera</i>	0.70	0.84	7.00	1.82	2.66
<i>Sphaeralcea coccinea</i>	1.40	1.67	14.00	3.64	5.31
<i>Taraxacum officinale</i>	0.20	0.24	2.00	0.52	0.76
Lichen spp.	0.30	0.36	2.00	0.52	0.88
Litter	16.10		72.00		
Soil	0.20		2.00		
Rock	0.00		0.00		

**Table 35. Points Analysis of the Sandy Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron smithii	0.90	1.58	8.00	2.42	4.00
Andropogon scoparius	0.20	0.35	2.00	0.60	0.95
Bouteloua curtipendula	0.10	0.18	1.00	0.30	0.48
Bouteloua gracilis	4.90	8.61	30.00	9.06	17.67
Calamovilfa longifolia	7.30	12.83	50.00	15.11	27.94
Calamagrostis montanensis	0.40	0.70	3.00	0.91	1.61
Koeleria pyramidata	1.50	2.64	12.00	3.63	6.27
Stipa comata	6.90	12.13	49.00	14.80	26.93
Stipa viridula	0.30	0.53	3.00	0.91	1.44
Carex filifolia	15.60	27.42	67.00	20.24	47.66
Carex heliophila	15.60	27.42	81.00	24.47	51.89
Artemisia dracunculus	0.30	0.53	3.00	0.91	1.44
Artemisia frigida	0.10	0.18	1.00	0.30	0.48
Artemisia ludoviciana	0.10	0.18	1.00	0.30	0.48
Cirsium undulatum	0.60	1.05	2.00	0.60	1.65
Echinacea angustifolia	0.10	0.18	1.00	0.30	0.48
Grindelia squarrosa	0.20	0.35	1.00	0.30	0.65
Liatris punctata	0.10	0.18	1.00	0.30	0.48
Lygodesmia juncea	0.20	0.35	2.00	0.60	0.95
Polygala alba	0.20	0.35	2.00	0.60	0.95
Rosa arkansana	1.20	2.11	10.00	3.02	5.13
Lichen spp.	0.10	0.18	1.00	0.30	0.48
Litter	39.70		99.00		
Soil	3.40		22.00		
Rock	0.00		0.00		

**Table 36. Points Analysis of the Shallow Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	0.30	0.47	3.00	0.93	1.40
<i>Bouteloua gracilis</i>	15.40	24.21	65.00	20.25	44.46
<i>Calamagrostis montanensis</i>	0.10	0.16	1.00	0.31	0.47
<i>Koeleria pyramidata</i>	8.10	12.74	48.00	14.95	27.69
<i>Muhlenbergia cuspidata</i>	2.60	4.09	20.00	6.23	10.32
<i>Stipa comata</i>	3.20	5.03	27.00	8.41	13.44
<i>Carex filifolia</i>	9.30	14.62	52.00	16.20	30.82
<i>Carex heliophila</i>	6.30	9.91	37.00	11.53	21.44
<i>Antennaria neglecta</i>	0.10	0.16	1.00	0.31	0.47
<i>Artemisia dracunculus</i>	0.30	0.47	3.00	0.93	1.40
<i>Artemisia frigida</i>	0.30	0.47	3.00	0.93	1.40
<i>Aster ericoides</i>	0.60	0.94	6.00	1.87	2.81
<i>Echinacea angustifolia</i>	0.20	0.31	2.00	0.62	0.93
<i>Erysimum asperum</i>	0.20	0.31	2.00	0.62	0.93
<i>Hedeoma hispida</i>	0.10	0.16	1.00	0.31	0.47
<i>Lotus americanus</i>	0.10	0.16	1.00	0.31	0.47
<i>Lygodesmia juncea</i>	0.10	0.16	1.00	0.31	0.47
<i>Petalostemon purpureum</i>	0.10	0.16	1.00	0.31	0.47
<i>Phlox hoodii</i>	1.80	2.83	16.00	4.98	7.81
<i>Polygala alba</i>	0.10	0.16	1.00	0.31	0.47
<i>Tragopogon dubius</i>	0.10	0.16	1.00	0.31	0.47
<i>Juniperus horizontalis</i>	12.50	19.65	20.00	6.23	25.88
Lichen spp.	1.70	2.67	9.00	2.80	5.47
Litter	32.10		89.00		
Soil	4.30		23.00		
Rock	0.00		0.00		

**Table 37. Points Analysis of the Silty Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	10.60	15.34	65.00	18.41	33.75
<i>Bouteloua gracilis</i>	32.30	46.74	95.00	26.91	73.65
<i>Buchloe dactyloides</i>	0.20	0.29	2.00	0.57	0.86
<i>Calamagrostis montanensis</i>	0.20	0.29	2.00	0.57	0.86
<i>Koeleria pyramidata</i>	1.10	1.59	10.00	2.83	4.42
<i>Stipa comata</i>	2.70	3.91	22.00	6.23	10.14
<i>Stipa viridula</i>	5.20	7.53	36.00	10.20	17.73
<i>Carex filifolia</i>	2.90	4.20	19.00	5.38	9.58
<i>Carex heliophila</i>	6.00	8.68	38.00	10.76	19.44
<i>Achillea millefolium</i>	0.10	0.14	1.00	0.28	0.42
<i>Androsace occidentalis</i>	0.50	0.72	5.00	1.42	2.14
<i>Artemisia frigida</i>	0.50	0.72	4.00	1.13	1.85
<i>Conyza canadensis</i>	4.30	6.22	31.00	8.78	15.00
<i>Echinacea angustifolia</i>	0.20	0.29	2.00	0.57	0.86
<i>Hedeoma hispida</i>	0.70	1.01	6.00	1.70	2.71
<i>Neslia paniculata</i>	0.20	0.29	2.00	0.57	0.86
<i>Opuntia fragilis</i>	0.10	0.14	1.00	0.28	0.42
<i>Phlox hoodii</i>	0.40	0.58	3.00	0.85	1.43
<i>Plantago purshii</i>	0.10	0.14	1.00	0.28	0.42
<i>Potentilla pensylvanica</i>	0.20	0.29	2.00	0.57	0.86
<i>Ratibida columnifera</i>	0.20	0.29	2.00	0.57	0.86
<i>Sphaeralcea coccinea</i>	0.30	0.43	3.00	0.85	1.28
Lichen spp.	0.10	0.14	1.00	0.28	0.42
Litter	30.30		94.00		
Soil	0.60		6.00		
Rock	0.00		0.00		

**Table 38. Points Analysis of the Clayey Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	14.90	20.22	72.00	18.56	38.78
<i>Bouteloua gracilis</i>	29.60	40.16	93.00	23.97	64.13
<i>Koeleria pyramidata</i>	3.40	4.61	23.00	5.93	10.54
<i>Stipa comata</i>	2.40	3.26	19.00	4.90	8.16
<i>Stipa viridula</i>	4.60	6.24	32.00	8.25	14.49
<i>Carex filifolia</i>	1.70	2.31	13.00	3.35	5.66
<i>Carex heliophila</i>	2.40	3.26	19.00	4.90	8.16
<i>Achillea millefolium</i>	0.70	0.95	6.00	1.55	2.50
<i>Androsace occidentalis</i>	0.10	0.14	1.00	0.26	0.40
<i>Antennaria parvifolia</i>	0.40	0.54	3.00	0.77	1.31
<i>Arabis holboellii</i>	0.10	0.14	1.00	0.26	0.40
<i>Artemisia dracunculus</i>	0.50	0.68	5.00	1.29	1.97
<i>Artemisia frigida</i>	1.70	2.31	14.00	3.61	5.92
<i>Conyza canadensis</i>	6.90	9.36	49.00	12.63	21.99
<i>Erysimum asperum</i>	0.20	0.27	2.00	0.52	0.79
<i>Grindelia squarrosa</i>	0.50	0.68	2.00	0.52	1.20
<i>Hedeoma hispida</i>	0.60	0.81	6.00	1.55	2.36
<i>Hippuris vulgaris</i>	0.20	0.27	2.00	0.52	0.79
<i>Melilotus officinalis</i>	0.20	0.27	1.00	0.26	0.53
<i>Neslia paniculata</i>	0.10	0.14	1.00	0.26	0.40
<i>Orthocarpus luteus</i>	0.20	0.27	2.00	0.52	0.79
<i>Potentilla pensylvanica</i>	0.60	0.81	6.00	1.55	2.36
<i>Psoralea esculenta</i>	0.20	0.27	2.00	0.52	0.79
<i>Ratibida columnifera</i>	0.30	0.41	3.00	0.77	1.18
<i>Solidago rigida</i>	0.20	0.27	2.00	0.52	0.79
<i>Sphaeralcea coccinea</i>	0.70	0.95	6.00	1.55	2.50
<i>Vicia americana</i>	0.10	0.14	1.00	0.26	0.40
Lichen spp.	0.20	0.27	2.00	0.52	0.79
Litter	26.00		91.00		
Soil	0.30		2.00		
Rock	0.00		0.00		



**Table 39. Points Analysis of the Sandy Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Bouteloua gracilis</i>	12.00	19.74	68.00	18.99	38.73
<i>Calamovilfa longifolia</i>	1.50	2.47	11.00	3.07	5.54
<i>Calamagrostis montanensis</i>	0.50	0.82	5.00	1.40	2.22
<i>Koeleria pyramidata</i>	6.90	11.35	43.00	12.01	23.36
<i>Panicum oligosanthes</i>	0.70	1.15	7.00	1.96	3.11
<i>Stipa comata</i>	6.20	10.20	42.00	11.73	21.93
<i>Stipa viridula</i>	0.10	0.16	1.00	0.28	0.44
<i>Carex filifolia</i>	19.10	31.41	79.00	22.07	53.48
<i>Carex heliophila</i>	5.50	9.05	39.00	10.89	19.94
<i>Artemisia dracuncululus</i>	0.30	0.49	2.00	0.56	1.05
<i>Artemisia frigida</i>	0.10	0.16	1.00	0.28	0.44
<i>Erysimum asperum</i>	0.40	0.66	4.00	1.12	1.78
<i>Gaura coccinea</i>	0.20	0.33	2.00	0.56	0.89
<i>Lygodesmia juncea</i>	0.10	0.16	1.00	0.28	0.44
<i>Neslia paniculata</i>	0.30	0.49	3.00	0.84	1.33
<i>Oxytropis lambertii</i>	0.30	0.49	2.00	0.56	1.05
<i>Phlox hoodii</i>	1.30	2.14	7.00	1.96	4.10
<i>Potentilla pensylvanica</i>	0.10	0.16	1.00	0.28	0.44
<i>Psoralea argophylla</i>	0.10	0.16	1.00	0.28	0.44
<i>Ratibida columnifera</i>	0.10	0.16	1.00	0.28	0.44
<i>Solidago missouriensis</i>	0.20	0.33	1.00	0.28	0.61
<i>Vernonia fasciculata</i>	0.10	0.16	1.00	0.28	0.44
Lichen spp.	4.70	7.73	36.00	10.06	17.79
Litter	32.70		95.00		
Soil	6.50		38.00		
Rock	0.00		0.00		

**Table 40. Points Analysis of the Shallow Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	0.20	0.34	2.00	0.58	0.92
<i>Bouteloua gracilis</i>	14.80	25.13	72.00	20.81	45.94
<i>Calamagrostis montanensis</i>	0.20	0.34	2.00	0.58	0.92
<i>Koeleria pyramidata</i>	9.60	16.30	59.00	17.05	33.35
<i>Muhlenbergia cuspidata</i>	0.20	0.34	2.00	0.58	0.92
<i>Stipa comata</i>	9.40	15.96	59.00	17.05	33.01
<i>Stipa viridula</i>	0.20	0.34	2.00	0.58	0.92
<i>Carex filifolia</i>	14.20	24.11	76.00	21.97	46.08
<i>Carex heliophila</i>	0.70	1.19	6.00	1.73	2.92
<i>Artemisia dracunculus</i>	0.80	1.36	7.00	2.02	3.38
<i>Artemisia ludoviciana</i>	0.10	0.17	1.00	0.29	0.46
<i>Chrysopsis villosa</i>	0.10	0.17	1.00	0.29	0.46
<i>Commandra umbellata</i>	0.10	0.17	1.00	0.29	0.46
<i>Gaura coccinea</i>	0.20	0.34	2.00	0.58	0.92
<i>Linum rigidum</i>	0.10	0.17	1.00	0.29	0.46
<i>Neslia paniculata</i>	0.10	0.17	1.00	0.29	0.46
<i>Oxytropis lambertii</i>	0.90	1.53	8.00	2.31	3.84
<i>Petalostemon purpureum</i>	0.10	0.17	1.00	0.29	0.46
<i>Phlox hoodii</i>	0.50	0.85	4.00	1.16	2.01
<i>Ratibida columnifera</i>	0.10	0.17	1.00	0.29	0.46
<i>Thermopsis rhombifolia</i>	0.10	0.17	1.00	0.29	0.46
<i>Rosa arkansana</i>	0.20	0.34	2.00	0.58	0.92
Lichen spp.	6.00	10.19	35.00	10.12	20.31
Litter	33.20		91.00		
Soil	7.90		34.00		
Rock	0.00		0.00		

**Table 41. Points Analysis of the Silty Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	8.10	10.53	47.00	12.98	23.51
<i>Bouteloua gracilis</i>	37.90	49.28	97.00	26.80	76.08
<i>Koeleria pyramidata</i>	2.20	2.86	19.00	5.25	8.11
<i>Munroa squarrosa</i>	0.20	0.26	2.00	0.55	0.81
<i>Stipa comata</i>	2.20	2.86	21.00	5.80	8.66
<i>Stipa viridula</i>	2.80	3.64	25.00	6.91	10.55
<i>Carex filifolia</i>	9.60	12.48	46.00	12.71	25.19
<i>Carex heliophila</i>	0.60	0.78	4.00	1.10	1.88
<i>Achillea millefolium</i>	0.10	0.13	1.00	0.28	0.41
<i>Androsace occidentalis</i>	0.40	0.52	4.00	1.10	1.62
<i>Antennaria parvifolia</i>	0.20	0.26	1.00	0.28	0.54
<i>Artemisia dracunculus</i>	0.20	0.26	2.00	0.55	0.81
<i>Artemisia frigida</i>	1.30	1.69	12.00	3.31	5.00
<i>Artemisia ludoviciana</i>	0.20	0.26	2.00	0.55	0.81
<i>Conyza canadensis</i>	5.90	7.67	36.00	9.94	17.61
<i>Erysimum asperum</i>	0.10	0.13	1.00	0.28	0.41
<i>Hedeoma hispida</i>	2.30	2.99	20.00	5.52	8.51
<i>Lotus americanus</i>	0.10	0.13	1.00	0.28	0.41
<i>Neslia paniculata</i>	0.20	0.26	2.00	0.55	0.81
<i>Opuntia fragilis</i>	0.20	0.26	2.00	0.55	0.81
<i>Orthocarpus luteus</i>	0.10	0.13	1.00	0.28	0.41
<i>Phlox hoodii</i>	0.40	0.52	2.00	0.55	1.07
<i>Plantago purshii</i>	0.40	0.52	4.00	1.10	1.62
<i>Sphaeralcea coccinea</i>	0.40	0.52	4.00	1.10	1.62
<i>Taraxacum officinale</i>	0.10	0.13	1.00	0.28	0.41
Lichen spp.	0.70	0.91	5.00	1.38	2.29
Litter	22.40		79.00		
Soil	0.70		6.00		
Rock	0.00		0.00		

**Table 42. Points Analysis of the Clayey Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	4.90	8.55	39.00	12.62	21.17
<i>Bouteloua gracilis</i>	29.00	50.61	82.00	26.54	77.15
<i>Calamagrostis montanensis</i>	0.60	1.05	6.00	1.94	2.99
<i>Koeleria pyramidata</i>	5.40	9.42	40.00	12.94	22.36
<i>Muhlenbergia cuspidata</i>	0.10	0.17	1.00	0.32	0.49
<i>Poa compressa</i>	0.60	1.05	3.00	0.97	2.02
<i>Schedonnardus paniculatus</i>	0.20	0.35	2.00	0.65	1.00
<i>Stipa comata</i>	2.00	3.49	16.00	5.18	8.67
<i>Stipa viridula</i>	2.40	4.19	20.00	6.47	10.66
<i>Carex filifolia</i>	1.40	2.44	12.00	3.88	6.32
<i>Carex heliophila</i>	1.90	3.32	14.00	4.53	7.85
<i>Achillea millefolium</i>	0.40	0.70	3.00	0.97	1.67
<i>Antennaria parvifolia</i>	0.80	1.40	5.00	1.62	3.02
<i>Artemisia dracunculus</i>	0.70	1.22	6.00	1.94	3.16
<i>Artemisia frigida</i>	0.20	0.35	2.00	0.65	1.00
<i>Aster ericoides</i>	0.10	0.17	1.00	0.32	0.49
<i>Ceratoides lanata</i>	0.10	0.17	1.00	0.32	0.49
<i>Echinacea angustifolia</i>	0.10	0.17	1.00	0.32	0.49
<i>Grindelia squarrosa</i>	0.10	0.17	1.00	0.32	0.49
<i>Gutierrezia sarothrae</i>	0.20	0.35	2.00	0.65	1.00
<i>Oenothera serrulata</i>	0.10	0.17	1.00	0.32	0.49
<i>Orthocarpus luteus</i>	0.50	0.87	5.00	1.62	2.49
<i>Oxytropis lambertii</i>	0.10	0.17	1.00	0.32	0.49
<i>Petalostemon purpureum</i>	0.10	0.17	1.00	0.32	0.49
<i>Phlox hoodii</i>	1.40	2.44	13.00	4.21	6.65
<i>Plantago purshii</i>	0.10	0.17	1.00	0.32	0.49
<i>Polygala alba</i>	0.10	0.17	1.00	0.32	0.49
<i>Psoralea esculenta</i>	0.10	0.17	1.00	0.32	0.49
<i>Solidago missouriensis</i>	0.10	0.17	1.00	0.32	0.49
Lichen spp.	3.50	6.11	27.00	8.74	14.85
Litter	34.20		96.00		
Soil	8.40		34.00		
Rock	0.10		1.00		

**Table 43. Points Analysis of the Sandy Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron smithii	0.90	1.59	8.00	2.33	3.92
Bouteloua gracilis	14.70	25.93	72.00	20.99	46.92
Calamovilfa longifolia	2.00	3.53	16.00	4.66	8.19
Calamagrostis montanensis	0.10	0.18	1.00	0.29	0.47
Koeleria pyramidata	7.30	12.87	53.00	15.45	28.32
Muhlenbergia cuspidata	0.30	0.53	3.00	0.87	1.40
Panicum oligosanthos	0.20	0.35	2.00	0.58	0.93
Stipa comata	7.30	12.87	49.00	14.29	27.16
Stipa viridula	0.20	0.35	2.00	0.58	0.93
Carex filifolia	9.50	16.75	46.00	13.41	30.16
Carex heliophila	9.60	16.93	57.00	16.62	33.55
Antennaria parvifolia	0.20	0.35	1.00	0.29	0.64
Artemisia dracunculus	0.60	1.06	6.00	1.75	2.81
Artemisia ludoviciana	0.20	0.35	2.00	0.58	0.93
Astragalus canadensis	0.30	0.53	3.00	0.87	1.40
Cerastium arvense	0.10	0.18	1.00	0.29	0.47
Gaura coccinea	0.20	0.35	2.00	0.58	0.93
Gutierrezia sarothrae	0.10	0.18	1.00	0.29	0.47
Hedeoma hispida	0.10	0.18	1.00	0.29	0.47
Lactuca oblongifolia	0.10	0.18	1.00	0.29	0.47
Lotus americanus	0.10	0.18	1.00	0.29	0.47
Neslia paniculata	0.10	0.18	1.00	0.29	0.47
Oxytropis lambertii	0.10	0.18	1.00	0.29	0.47
Psoralea argophylla	0.10	0.18	1.00	0.29	0.47
Solidago rigida	0.10	0.18	1.00	0.29	0.47
Lichen spp.	2.20	3.88	11.00	3.21	7.09
Litter	38.20		95.00		
Soil	5.10		33.00		
Rock	0.00		0.00		

**Table 44. Points Analysis of the Shallow Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron smithii	0.70	1.11	7.00	1.99	3.10
Bouteloua gracilis	23.90	37.76	87.00	24.72	62.48
Calamagrostis montanensis	0.40	0.63	3.00	0.85	1.48
Koeleria pyramidata	11.70	18.48	69.00	19.60	38.08
Stipa comata	6.10	9.64	50.00	14.20	23.84
Stipa viridula	0.10	0.16	1.00	0.28	0.44
Carex filifolia	12.00	18.96	67.00	19.03	37.99
Carex heliophila	1.00	1.58	6.00	1.70	3.28
Allionia ainearis	0.10	0.16	1.00	0.28	0.44
Antennaria parvifolia	0.60	0.95	6.00	1.70	2.65
Artemisia dracunculus	1.20	1.90	9.00	2.56	4.46
Artemisia frigida	0.10	0.16	1.00	0.28	0.44
Aster ericoides	0.10	0.16	1.00	0.28	0.44
Gaura coccinea	0.20	0.32	2.00	0.57	0.89
Hedeoma hispida	0.30	0.47	3.00	0.85	1.32
Lygodesmia juncea	0.20	0.32	2.00	0.57	0.89
Neslia paniculata	0.20	0.32	2.00	0.57	0.89
Oxytropis lambertii	0.20	0.32	2.00	0.57	0.89
Phlox hoodii	1.10	1.74	10.00	2.84	4.58
Polygala alba	0.10	0.16	1.00	0.28	0.44
Ratibida columnifera	0.10	0.16	1.00	0.28	0.44
Sphaeralcea coccinea	0.10	0.16	1.00	0.28	0.44
Vernonia fasciculata	0.10	0.16	1.00	0.28	0.44
Lichen spp.	2.70	4.27	19.00	5.40	9.67
Litter	30.10		89.00		
Soil	6.60		41.00		
Rock	0.00		0.00		

**Table 45. Points Analysis of the Silty Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	9.10	14.11	59.00	19.80	33.91
<i>Bouteloua gracilis</i>	35.50	55.04	88.00	29.53	84.57
<i>Calamagrostis montanensis</i>	0.40	0.62	4.00	1.34	1.96
<i>Koeleria pyramidata</i>	3.10	4.81	19.00	6.38	11.19
<i>Stipa comata</i>	4.10	6.36	31.00	10.40	16.76
<i>Stipa viridula</i>	3.50	5.43	29.00	9.73	15.16
<i>Carex filifolia</i>	4.50	6.98	27.00	9.06	16.04
<i>Carex heliophila</i>	1.00	1.55	9.00	3.02	4.57
<i>Androsace occidentalis</i>	0.20	0.31	2.00	0.67	0.98
<i>Antennaria parvifolia</i>	0.10	0.16	1.00	0.34	0.50
<i>Artemisia dracunculul</i>	0.20	0.31	1.00	0.34	0.65
<i>Artemisia frigida</i>	0.10	0.16	1.00	0.34	0.50
<i>Ceratoides lanata</i>	0.10	0.16	1.00	0.34	0.50
<i>Conyza canadensis</i>	0.20	0.31	2.00	0.67	0.98
<i>Hedeoma hispida</i>	0.40	0.62	4.00	1.34	1.96
<i>Lotus americanus</i>	0.20	0.31	2.00	0.67	0.98
<i>Melilotus officinalis</i>	0.20	0.31	2.00	0.67	0.98
<i>Phlox hoodii</i>	0.30	0.47	3.00	1.01	1.48
<i>Polygala alba</i>	0.30	0.47	3.00	1.01	1.48
<i>Psoralea argophylla</i>	0.10	0.16	1.00	0.34	0.50
<i>Ratibida columnifera</i>	0.20	0.31	2.00	0.67	0.98
<i>Sphaeralcea coccinea</i>	0.40	0.62	4.00	1.34	1.96
<i>Taraxacum officinale</i>	0.30	0.47	3.00	1.01	1.48
Litter	32.90		94.00		
Soil	2.60		16.00		
Rock	0.00		0.00		

**Table 46. Points Analysis of the Clayey Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Basal Cover	Relative Basal Cover	Percent Frequency	Relative Frequency	Importance Value
<i>Agropyron smithii</i>	4.60	7.92	31.00	9.14	17.06
<i>Andropogon scoparius</i>	0.10	0.17	1.00	0.29	0.46
<i>Bouteloua gracilis</i>	23.60	40.62	75.00	22.12	62.74
<i>Koeleria pyramidata</i>	6.60	11.36	46.00	13.57	24.93
<i>Muhlenbergia cuspidata</i>	3.40	5.85	24.00	7.08	12.93
<i>Munroa squarrosa</i>	0.20	0.34	2.00	0.59	0.93
<i>Poa pratensis</i>	0.10	0.17	1.00	0.29	0.46
<i>Schedonnardus paniculatus</i>	0.20	0.34	2.00	0.59	0.93
<i>Stipa comata</i>	1.10	1.89	10.00	2.95	4.84
<i>Stipa viridula</i>	1.10	1.89	8.00	2.36	4.25
<i>Carex filifolia</i>	1.80	3.10	15.00	4.42	7.52
<i>Carex heliophila</i>	2.20	3.79	19.00	5.60	9.39
<i>Achillea millefolium</i>	0.10	0.17	1.00	0.29	0.46
<i>Antennaria parvifolia</i>	2.10	3.61	14.00	4.13	7.74
<i>Artemisia dracunculus</i>	0.40	0.69	3.00	0.88	1.57
<i>Artemisia frigida</i>	0.30	0.52	3.00	0.88	1.40
<i>Artemisia ludoviciana</i>	0.20	0.34	2.00	0.59	0.93
<i>Astragalus canadensis</i>	0.20	0.34	2.00	0.59	0.93
<i>Aster ericoides</i>	0.10	0.17	1.00	0.29	0.46
<i>Echinacea angustifolia</i>	0.30	0.52	3.00	0.88	1.40
<i>Grindelia squarrosa</i>	0.70	1.20	5.00	1.47	2.67
<i>Gutierrezia sarothrae</i>	0.20	0.34	1.00	0.29	0.63
<i>Hedeoma hispida</i>	0.20	0.34	2.00	0.59	0.93
<i>Kochia scoparia</i>	0.10	0.17	1.00	0.29	0.46
<i>Lotus americanus</i>	0.60	1.03	6.00	1.77	2.80
<i>Neslia paniculata</i>	0.10	0.17	1.00	0.29	0.46
<i>Oxytropis lambertii</i>	0.40	0.69	3.00	0.88	1.57
<i>Phlox hoodii</i>	1.40	2.41	11.00	3.24	5.65
<i>Plantago purshii</i>	0.10	0.17	1.00	0.29	0.46
<i>Polygala alba</i>	0.20	0.34	1.00	0.29	0.63
<i>Potentilla pensylvanica</i>	0.10	0.17	1.00	0.29	0.46
<i>Polygonum arenastrum</i>	0.20	0.34	2.00	0.59	0.93
<i>Psoralea argophylla</i>	1.00	1.72	9.00	2.65	4.37
<i>Psoralea esculenta</i>	0.10	0.17	1.00	0.29	0.46
<i>Ratibida columnifera</i>	0.10	0.17	1.00	0.29	0.46
<i>Vernonia fasciculata</i>	0.20	0.34	2.00	0.59	0.93
<i>Rosa arkansana</i>	0.10	0.17	1.00	0.29	0.46
Lichen spp.	3.60	6.20	27.00	7.96	14.16
Litter	30.00		88.00		
Soil	11.90		48.00		
Rock	0.00		0.00		



**Table 47. Points Analysis of the Sandy Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron smithii	0.40	0.71	3.00	0.96	1.67
Bouteloua gracilis	20.30	35.99	82.00	26.11	62.10
Calamovilfa longifolia	0.40	0.71	4.00	1.27	1.98
Koeleria pyramidata	4.60	8.16	31.00	9.87	18.03
Muhlenbergia cuspidata	0.80	1.42	7.00	2.23	3.65
Panicum oligosanthos	0.20	0.35	2.00	0.64	0.99
Stipa comata	6.60	11.70	46.00	14.65	26.35
Carex filifolia	9.80	17.38	45.00	14.33	31.71
Carex heliophila	8.80	15.60	57.00	18.15	33.75
Antennaria neglecta	0.10	0.18	1.00	0.32	0.50
Antennaria parvifolia	0.10	0.18	1.00	0.32	0.50
Artemisia dracunculus	0.20	0.35	1.00	0.32	0.67
Artemisia frigida	0.10	0.18	1.00	0.32	0.50
Artemisia ludoviciana	0.10	0.18	1.00	0.32	0.50
Erigeron spp.	0.20	0.35	2.00	0.64	0.99
Gaura coccinea	0.20	0.35	1.00	0.32	0.67
Lactuca oblongifolia	0.10	0.18	1.00	0.32	0.50
Lithospermum incisum	0.10	0.18	1.00	0.32	0.50
Lygodesmia juncea	0.10	0.18	1.00	0.32	0.50
Neslia paniculata	0.20	0.35	2.00	0.64	0.99
Opuntia fragilis	0.20	0.35	2.00	0.64	0.99
Phlox hoodii	0.30	0.53	3.00	0.96	1.49
Psoralea argophylla	0.20	0.35	2.00	0.64	0.99
Solidago rigida	0.10	0.18	1.00	0.32	0.50
Sphaeralcea coccinea	0.10	0.18	1.00	0.32	0.50
Selaginella densa	0.10	0.18	1.00	0.32	0.50
Lichen spp.	2.00	3.55	14.00	4.46	8.01
Litter	31.60		96.00		
Soil	12.00		64.00		
Rock	0.00		0.00		

**Table 48. Points Analysis of the Shallow Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron trachycaulum	0.10	0.20	1.00	0.36	0.56
Bouteloua gracilis	19.70	38.70	75.00	27.27	65.97
Calamovilfa longifolia	0.60	1.18	6.00	2.18	3.36
Calamagrostis montanensis	0.30	0.59	2.00	0.73	1.32
Koeleria pyramidata	0.70	1.38	4.00	1.45	2.83
Muhlenbergia cuspidata	0.70	1.38	4.00	1.45	2.83
Munroa squarrosa	0.20	0.39	2.00	0.73	1.12
Stipa comata	6.90	13.56	51.00	18.55	32.11
Carex filifolia	15.00	29.47	73.00	26.55	56.02
Carex heliophila	0.40	0.79	3.00	1.09	1.88
Commandra umbellata	0.20	0.39	2.00	0.73	1.12
Eriogonum flavum	0.30	0.59	2.00	0.73	1.32
Erigeron spp.	0.10	0.20	1.00	0.36	0.56
Lepidium densiflorum	0.10	0.20	1.00	0.36	0.56
Lotus americanus	0.10	0.20	1.00	0.36	0.56
Neslia paniculata	0.20	0.39	2.00	0.73	1.12
Oenothera serrulata	0.20	0.39	2.00	0.73	1.12
Opuntia fragilis	0.10	0.20	1.00	0.36	0.56
Phlox hoodii	0.60	1.18	6.00	2.18	3.36
Polygala alba	0.50	0.98	5.00	1.82	2.80
Psoralea argophylla	0.10	0.20	1.00	0.36	0.56
Rosa arkansana	0.10	0.20	1.00	0.36	0.56
Lichen spp.	3.70	7.27	29.00	10.55	17.82
Litter	30.40		94.00		
Soil	18.70		79.00		
Rock	0.00		0.00		

**Table 49. Points Analysis of the Silty Range Site on the Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	3.10	5.02	23.00	7.19	12.21
<i>Agropyron trachycaulum</i>	0.10	0.16	1.00	0.31	0.47
<i>Andropogon scoparius</i>	0.40	0.65	2.00	0.63	1.28
<i>Bouteloua gracilis</i>	28.10	45.54	87.00	27.19	72.73
<i>Calamagrostis montanensis</i>	0.40	0.65	4.00	1.25	1.90
<i>Koeleria pyramidata</i>	5.30	8.59	38.00	11.88	20.47
<i>Muhlenbergia cuspidata</i>	0.70	1.13	4.00	1.25	2.38
<i>Munroa squarrosa</i>	0.10	0.16	1.00	0.31	0.47
<i>Stipa comata</i>	5.20	8.43	37.00	11.56	19.99
<i>Stipa viridula</i>	0.50	0.81	5.00	1.56	2.37
<i>Carex filifolia</i>	11.60	18.80	64.00	20.00	38.80
<i>Carex heliophila</i>	0.70	1.13	7.00	2.19	3.32
<i>Artemisia dracunculus</i>	0.10	0.16	1.00	0.31	0.47
<i>Aster ericoides</i>	0.40	0.65	3.00	0.94	1.59
<i>Echinacea angustifolia</i>	0.40	0.65	3.00	0.94	1.59
<i>Gaura coccinea</i>	0.10	0.16	1.00	0.31	0.47
<i>Gutierrezia sarothrae</i>	0.20	0.32	2.00	0.63	0.95
<i>Hedeoma hispida</i>	0.50	0.81	5.00	1.56	2.37
<i>Linum rigidum</i>	0.10	0.16	1.00	0.31	0.47
<i>Oxytropis lambertii</i>	0.30	0.49	3.00	0.94	1.43
<i>Petalostemon purpureum</i>	0.20	0.32	2.00	0.63	0.95
<i>Phlox hoodii</i>	1.60	2.59	12.00	3.75	6.34
<i>Polygala alba</i>	0.10	0.16	1.00	0.31	0.47
<i>Ratibida columnifera</i>	0.10	0.16	1.00	0.31	0.47
<i>Sphaeralcea coccinea</i>	0.40	0.65	4.00	1.25	1.90
Lichen spp.	1.00	1.62	8.00	2.50	4.12
Litter	28.20		94.00		
Soil	10.10		47.00		
Rock	0.00		0.00		

**Table 50. Points Analysis of the Sandy Range Site on Native Range, Pasture 5, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Andropogon scoparius</i>	0.80	1.48	6.00	1.82	3.30
<i>Aristida longiseta</i>	0.30	0.56	2.00	0.61	1.17
<i>Bouteloua gracilis</i>	8.30	15.40	55.00	16.72	32.12
<i>Calamovilfa longifolia</i>	8.00	14.84	44.00	13.37	28.21
<i>Calamagrostis montanensis</i>	0.20	0.37	2.00	0.61	0.98
<i>Koeleria pyramidata</i>	3.40	6.31	22.00	6.69	13.00
<i>Muhlenbergia cuspidata</i>	0.20	0.37	2.00	0.61	0.98
<i>Panicum oligosanthos</i>	1.10	2.04	9.00	2.74	4.78
<i>Stipa comata</i>	7.20	13.36	45.00	13.68	27.04
<i>Stipa viridula</i>	1.00	1.86	8.00	2.43	4.29
<i>Carex filifolia</i>	4.40	8.16	29.00	8.81	16.97
<i>Carex heliophila</i>	16.40	30.43	81.00	24.62	55.05
<i>Artemisia ludoviciana</i>	0.70	1.30	7.00	2.13	3.43
<i>Asclepias viridiflora</i>	0.20	0.37	2.00	0.61	0.98
<i>Erysimum asperum</i>	0.30	0.56	3.00	0.91	1.47
<i>Hedeoma hispida</i>	0.30	0.56	3.00	0.91	1.47
<i>Helianthus rigidus</i>	0.10	0.19	1.00	0.30	0.49
<i>Liatris punctata</i>	0.20	0.37	2.00	0.61	0.98
<i>Lygodesmia juncea</i>	0.20	0.37	2.00	0.61	0.98
<i>Opuntia fragilis</i>	0.40	0.74	2.00	0.61	1.35
<i>Oxytropis lambertii</i>	0.10	0.19	1.00	0.30	0.49
<i>Selaginella densa</i>	0.10	0.19	1.00	0.30	0.49
Litter	39.90		95.00		
Soil	6.20		39.00		
Rock	0.00		0.00		

**Table 51. Points Analysis of the Shallow Range Site on Native Range, Pasture 5, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Basal Cover	Relative Basal Cover	Percent Frequency	Relative Frequency	Importance Value
<i>Agropyron smithii</i>	0.20	0.30	2.00	0.56	0.86
<i>Andropogon scoparius</i>	0.30	0.45	2.00	0.56	1.01
<i>Aristida longiseta</i>	0.20	0.30	1.00	0.28	0.58
<i>Bouteloua gracilis</i>	17.80	26.93	75.00	21.19	48.12
<i>Calamagrostis montanensis</i>	0.10	0.15	1.00	0.28	0.43
<i>Koeleria pyramidata</i>	15.60	23.60	78.00	22.03	45.63
<i>Muhlenbergia cuspidata</i>	0.40	0.61	3.00	0.85	1.46
<i>Munroa squarrosa</i>	0.10	0.15	1.00	0.28	0.43
<i>Poa compressa</i>	0.20	0.30	1.00	0.28	0.58
<i>Stipa comata</i>	4.30	6.51	31.00	8.76	15.27
<i>Stipa viridula</i>	0.30	0.45	2.00	0.56	1.01
<i>Carex filifolia</i>	6.10	9.23	41.00	11.58	20.81
<i>Carex heliophila</i>	7.20	10.89	41.00	11.58	22.47
<i>Artemisia dracunculus</i>	0.30	0.45	3.00	0.85	1.30
<i>Artemisia ludoviciana</i>	0.50	0.76	4.00	1.13	1.89
<i>Aster ericoides</i>	0.40	0.61	4.00	1.13	1.74
<i>Chrysopsis villosa</i>	0.10	0.15	1.00	0.28	0.43
<i>Commandra umbellata</i>	0.10	0.15	1.00	0.28	0.43
<i>Coryphantha vivipara</i>	0.10	0.15	1.00	0.28	0.43
<i>Echinacea angustifolia</i>	0.30	0.45	3.00	0.85	1.30
<i>Erigeron</i> spp.	0.10	0.15	1.00	0.28	0.43
<i>Gaura coccinea</i>	0.10	0.15	1.00	0.28	0.43
<i>Helianthus rigidus</i>	0.30	0.45	3.00	0.85	1.30
<i>Lactuca oblongifolia</i>	0.10	0.15	1.00	0.28	0.43
<i>Liatis punctata</i>	0.30	0.45	2.00	0.56	1.01
<i>Linum rigidum</i>	0.10	0.15	1.00	0.28	0.43
<i>Lotus americanus</i>	0.20	0.30	2.00	0.56	0.86
<i>Oxytropis lambertii</i>	0.20	0.30	2.00	0.56	0.86
<i>Phlox hoodii</i>	1.70	2.57	12.00	3.39	5.96
<i>Polygala alba</i>	0.10	0.15	1.00	0.28	0.43
<i>Ratibida columnifera</i>	0.10	0.15	1.00	0.28	0.43
<i>Sphaeralcea coccinea</i>	0.10	0.15	1.00	0.28	0.43
<i>Taraxacum officinale</i>	0.10	0.15	1.00	0.28	0.43
<i>Juniperus horizontalis</i>	4.90	7.41	6.00	1.69	9.10
<i>Rosa arkansana</i>	0.20	0.30	2.00	0.56	0.86
Lichen spp.	2.90	4.39	21.00	5.93	10.32
Litter	29.10		89.00		
Soil	4.60		29.00		
Rock	0.20		2.00		

**Table 52. Points Analysis of the Silty Range Site on Native Range, Pasture 5, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	7.50	11.18	54.00	13.85	25.03
<i>Aristida longiseta</i>	0.30	0.45	2.00	0.51	0.96
<i>Bouteloua gracilis</i>	20.00	29.81	83.00	21.28	51.09
<i>Koeleria pyramidata</i>	10.10	15.05	49.00	12.56	27.61
<i>Munroa squarrosa</i>	0.10	0.15	1.00	0.26	0.41
<i>Panicum oligosanthes</i>	0.60	0.89	5.00	1.28	2.17
<i>Stipa comata</i>	6.50	9.69	43.00	11.03	20.72
<i>Stipa viridula</i>	0.30	0.45	2.00	0.51	0.96
<i>Carex eleocharis</i>	0.10	0.15	1.00	0.26	0.41
<i>Carex filifolia</i>	4.60	6.86	27.00	6.92	13.78
<i>Carex heliophila</i>	6.10	9.09	30.00	7.69	16.78
<i>Eleocharis</i> spp.	0.20	0.30	2.00	0.51	0.81
<i>Achillea millefolium</i>	0.10	0.15	1.00	0.26	0.41
<i>Agoseris glauca</i>	0.10	0.15	1.00	0.26	0.41
<i>Artemisia frigida</i>	0.90	1.34	9.00	2.31	3.65
<i>Aster ericoides</i>	0.20	0.30	2.00	0.51	0.81
<i>Conyza canadensis</i>	0.70	1.04	5.00	1.28	2.32
<i>Erysimum asperum</i>	0.30	0.45	2.00	0.51	0.96
<i>Hedeoma hispida</i>	0.30	0.45	3.00	0.77	1.22
<i>Lactuca oblongifolia</i>	0.20	0.30	2.00	0.51	0.81
<i>Liatrix punctata</i>	0.10	0.15	1.00	0.26	0.41
<i>Lithospermum incisum</i>	0.10	0.15	1.00	0.26	0.41
<i>Lotus americanus</i>	0.30	0.45	3.00	0.77	1.22
<i>Neslia paniculata</i>	0.10	0.15	1.00	0.26	0.41
<i>Opuntia fragilis</i>	0.10	0.15	1.00	0.26	0.41
<i>Orthocarpus luteus</i>	3.30	4.92	24.00	6.15	11.07
<i>Penstemon albidus</i>	1.00	1.49	10.00	2.56	4.05
<i>Petalostemon purpureum</i>	0.90	1.34	8.00	2.05	3.39
<i>Ratibida columnifera</i>	0.70	1.04	5.00	1.28	2.32
<i>Sphaeralcea coccinea</i>	0.20	0.30	2.00	0.51	0.81
<i>Selaginella densa</i>	0.50	0.75	4.00	1.03	1.78
<i>Lichen</i> spp.	0.60	0.89	6.00	1.54	2.43
Litter	32.30		94.00		
Soil	0.60		5.00		
Rock	0.00		0.00		

**Table 53. Points Analysis of the Sandy Range Site on Native Range, Pasture 6, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Agropyron smithii	0.80	1.28	8.00	2.61	3.89
Andropogon scoparius	0.20	0.32	2.00	0.65	0.97
Bouteloua gracilis	7.10	11.32	41.00	13.36	24.68
Calamovilfa longifolia	4.50	7.18	37.00	12.05	19.23
Calamagrostis montanensis	0.20	0.32	1.00	0.33	0.65
Koeleria pyramidata	1.80	2.87	15.00	4.89	7.76
Stipa comata	4.30	6.86	33.00	10.75	17.61
Stipa viridula	0.40	0.64	4.00	1.30	1.94
Carex filifolia	30.70	48.96	89.00	28.99	77.95
Carex heliophila	10.80	17.22	61.00	19.87	37.09
Artemisia dracunculus	0.30	0.48	2.00	0.65	1.13
Artemisia ludoviciana	0.30	0.48	2.00	0.65	1.13
Grindelia squarrosa	0.10	0.16	1.00	0.33	0.49
Lactuca oblongifolia	0.10	0.16	1.00	0.33	0.49
Lygodesmia juncea	0.30	0.48	3.00	0.98	1.46
Opuntia fragilis	0.10	0.16	1.00	0.33	0.49
Phlox hoodii	0.10	0.16	1.00	0.33	0.49
Rosa arkansana	0.10	0.16	1.00	0.33	0.49
Lichen spp.	0.50	0.80	4.00	1.30	2.10
Litter	33.10		100.00		
Soil	4.20		27.00		
Rock	0.00		0.00		

**Table 54. Points Analysis of the Shallow Range Site on Native Range, Pasture 6, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	2.50	3.27	20.00	5.01	8.28
<i>Andropogon scoparius</i>	0.10	0.13	1.00	0.25	0.38
<i>Bouteloua gracilis</i>	25.30	33.12	88.00	22.06	55.18
<i>Koeleria pyramidata</i>	11.10	14.53	65.00	16.29	30.82
<i>Muhlenbergia cuspidata</i>	1.10	1.44	7.00	1.75	3.19
<i>Stipa comata</i>	3.30	4.32	27.00	6.77	11.09
<i>Stipa viridula</i>	0.50	0.65	4.00	1.00	1.65
<i>Carex filifolia</i>	14.60	19.11	77.00	19.30	38.41
<i>Carex heliophila</i>	1.00	1.31	8.00	2.01	3.32
<i>Achillea millefolium</i>	0.30	0.39	2.00	0.50	0.89
<i>Artemisia dracunculus</i>	0.20	0.26	2.00	0.50	0.76
<i>Aster ericoides</i>	0.30	0.39	3.00	0.75	1.14
<i>Echinacea angustifolia</i>	0.10	0.13	1.00	0.25	0.38
<i>Erysimum asperum</i>	0.10	0.13	1.00	0.25	0.38
<i>Gaura coccinea</i>	0.30	0.39	3.00	0.75	1.14
<i>Liatis punctata</i>	0.40	0.52	4.00	1.00	1.52
<i>Neslia paniculata</i>	0.10	0.13	1.00	0.25	0.38
<i>Oxytropis lambertii</i>	1.10	1.44	11.00	2.76	4.20
<i>Petalostemon purpureum</i>	0.20	0.26	2.00	0.50	0.76
<i>Phlox hoodii</i>	2.90	3.80	16.00	4.01	7.81
<i>Vernonia fasciculata</i>	0.10	0.13	1.00	0.25	0.38
<i>Vicia americana</i>	0.20	0.26	2.00	0.50	0.76
<i>Selaginella densa</i>	0.40	0.52	3.00	0.75	1.27
Lichen spp.	10.20	13.35	50.00	12.53	25.88
Litter	22.30		85.00		
Soil	1.20		11.00		
Rock	0.10		1.00		



**Table 55. Points Analysis of the Silty Range Site on Native Range, Pasture 6, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
<i>Agropyron smithii</i>	7.70	10.69	53.00	13.73	24.42
<i>Bouteloua gracilis</i>	25.70	35.69	84.00	21.76	57.45
<i>Koeleria pyramidata</i>	3.90	5.42	25.00	6.48	11.90
<i>Poa compressa</i>	0.20	0.28	2.00	0.52	0.80
<i>Stipa comata</i>	5.70	7.92	39.00	10.10	18.02
<i>Stipa viridula</i>	2.40	3.33	17.00	4.40	7.73
<i>Carex filifolia</i>	13.80	19.17	64.00	16.58	35.75
<i>Carex heliophila</i>	3.00	4.17	16.00	4.15	8.32
<i>Achillea millefolium</i>	0.20	0.28	2.00	0.52	0.80
<i>Androsace occidentalis</i>	0.50	0.69	5.00	1.30	1.99
<i>Artemisia frigida</i>	0.20	0.28	2.00	0.52	0.80
<i>Conyza canadensis</i>	1.60	2.22	15.00	3.89	6.11
<i>Erysimum asperum</i>	0.90	1.25	9.00	2.33	3.58
<i>Gaura coccinea</i>	0.30	0.42	3.00	0.78	1.20
<i>Grindelia squarrosa</i>	0.20	0.28	2.00	0.52	0.80
<i>Hedeoma hispida</i>	0.50	0.69	5.00	1.30	1.99
<i>Lactuca oblongifolia</i>	0.10	0.14	1.00	0.26	0.40
<i>Lotus americanus</i>	0.30	0.42	3.00	0.78	1.20
<i>Opuntia fragilis</i>	0.40	0.56	2.00	0.52	1.08
<i>Orthocarpus luteus</i>	1.20	1.67	9.00	2.33	4.00
<i>Phlox hoodii</i>	0.10	0.14	1.00	0.26	0.40
<i>Plantago purshii</i>	0.10	0.14	1.00	0.26	0.40
<i>Potentilla pensylvanica</i>	1.60	2.22	13.00	3.37	5.59
<i>Ratibida columnifera</i>	0.10	0.14	1.00	0.26	0.40
<i>Sphaeralcea coccinea</i>	0.90	1.25	8.00	2.07	3.32
<i>Taraxacum officinale</i>	0.10	0.14	1.00	0.26	0.40
<i>Viola nuttallii</i>	0.20	0.28	2.00	0.52	0.80
Lichen spp.	0.10	0.14	1.00	0.26	0.40
Litter	27.80		90.00		
Soil	0.20		2.00		
Rock	0.00		0.00		

**Table 56. Percent Basal Cover for the Native Range Pastures on the Complementary Rotation  
Grazing System at the Dickinson Experiment Station, 1983**

<b>Range Site</b>	<b>Pasture #</b>	<b>Grass</b>	<b>Sedge</b>	<b>Forbs</b>	<b>Shrubs</b>	<b>Club Moss</b>	<b>Lichen</b>	<b>Litter</b>	<b>Soil</b>	<b>Rock</b>
<b>Clayey</b>	1	69.80	2.10	11.50	0.00	0.00	0.30	16.10	0.20	0.00
	2	54.90	4.10	14.50	0.00	0.00	0.20	26.00	0.30	0.00
	3	45.20	3.30	5.30	0.00	0.00	3.50	34.20	8.40	0.10
	4	41.00	4.00	9.40	0.10	0.00	3.60	30.00	11.90	0.00
	5									
	6									
	Mean	52.73	3.38	10.18	0.03	0.00	1.90	26.58	5.20	0.03
<b>Sandy</b>	1	22.50	31.20	1.90	1.20	0.00	0.10	39.70	3.40	0.00
	2	27.90	24.60	3.60	0.00	0.00	4.70	32.70	6.50	0.00
	3	33.00	19.10	2.40	0.00	0.00	2.20	38.20	5.10	0.00
	4	33.30	18.60	2.40	0.00	0.10	2.00	31.60	12.00	0.00
	5	30.50	20.80	2.50	0.00	0.10	0.00	39.90	6.20	0.00
	6	19.30	41.50	1.30	0.10	0.00	0.50	33.10	4.20	0.00
	Mean	27.75	25.97	2.35	0.22	0.03	1.58	35.87	6.23	0.00
<b>Shallow</b>	1	29.70	15.60	4.10	12.50	0.00	1.70	32.10	4.30	0.00
	2	34.60	14.90	3.20	0.20	0.00	6.00	33.20	7.90	0.00
	3	42.90	13.00	4.70	0.00	0.00	2.70	30.10	6.60	0.00
	4	29.20	15.40	2.50	0.10	0.00	3.70	30.40	18.70	0.00
	5	39.50	13.30	5.30	5.10	0.00	2.90	29.10	4.60	0.20
	6	43.90	15.60	6.30	0.00	0.40	10.20	22.30	1.20	0.10
	Mean	36.63	14.63	4.35	2.98	0.07	4.53	29.53	7.22	0.05
<b>Silty</b>	1	52.30	8.90	7.80	0.00	0.00	0.10	30.30	0.60	0.00
	2	53.40	10.20	12.60	0.00	0.00	0.70	22.40	0.70	0.00
	3	55.70	5.50	3.30	0.00	0.00	0.00	32.90	2.60	0.00
	4	43.90	12.30	4.50	0.00	0.00	1.00	28.20	10.10	0.00
	5	45.60	10.80	9.60	0.00	0.50	0.60	32.30	0.60	0.00
	6	45.60	16.80	9.50	0.00	0.00	0.10	27.80	0.20	0.00
	Mean	49.42	10.75	7.88	0.00	0.08	0.42	28.98	2.47	0.00

**Table 57. Points on the Altai Wildrye, West Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Avena sativa	0.10	0.40	1.00	0.76	1.16
Elymus angustus	3.10	12.50	21.00	15.91	28.41
Setaria glauca	14.50	58.47	66.00	50.00	108.47
Setaria verticillata	0.30	1.21	2.00	1.52	2.73
Setaria viridis	6.00	24.19	35.00	26.52	50.71
Amaranthus retroflexus	0.10	0.40	1.00	0.76	1.16
Convolvulus arvensis	0.30	1.21	2.00	1.52	2.73
Salsola kali	0.10	0.40	1.00	0.76	1.16
Xanthium strumarium	0.30	1.21	3.00	2.27	3.48
Litter	38.40		89.00		
Soil	36.80		86.00		
Rock	0.00		0.00		

**Table 58. Points Analysis on the Altai Wildrye, East Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Basal Cover</b>	<b>Relative Basal Cover</b>	<b>Percent Frequency</b>	<b>Relative Frequency</b>	<b>Importance Value</b>
Elymus angustus	4.00	9.15	28.00	14.00	23.15
Setaria glauca	9.20	21.05	43.00	21.50	42.55
Setaria verticillata	2.80	6.41	13.00	6.50	12.91
Setaria viridis	19.00	43.48	76.00	38.00	81.48
Convolvulus arvensis	0.80	1.83	7.00	3.50	5.33
Euphorbia dictyosperma	0.20	0.46	2.00	1.00	1.46
Euphorbia geyeri	0.10	0.23	1.00	0.50	0.73
Kochia scoparia	6.60	15.10	20.00	10.00	25.10
Salsola kali	0.10	0.23	1.00	0.50	0.73
Solidago missouriensis	0.10	0.23	1.00	0.50	0.73
Xanthium strumarium	0.80	1.83	8.00	4.00	5.83
Litter	41.60		98.00		
Soil	14.70		63.00		
Rock	0.00		0.00		

**Table 59. Density Analysis on the Crested Wheatgrass, West Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Density	Relative % Density	% Frequency	Relative % Frequency	Importance Value
<i>Androsace occidentalis</i>	0.02	0.30	1.00	0.69	0.99
<i>Conyza canadensis</i>	0.06	0.89	6.00	4.14	5.03
<i>Euphorbia geyeri</i>	0.09	1.34	9.00	6.21	7.55
<i>Hedeoma hispida</i>	1.40	20.86	53.00	36.55	57.41
<i>Linum rigidum</i>	0.03	0.45	2.00	1.38	1.83
<i>Lotus americanus</i>	0.05	0.75	5.00	3.45	4.20
<i>Melilotus officinalis</i>	0.03	0.45	3.00	2.07	2.52
<i>Neslia paniculata</i>	0.01	0.15	1.00	0.69	0.84
<i>Opuntia fragilis</i>	0.03	0.45	2.00	1.38	1.83
<i>Plantago purshii</i>	4.75	70.79	46.00	31.72	102.51
<i>Potentilla pensylvanica</i>	0.01	0.15	1.00	0.69	0.84
<i>Polygonum convolvulus</i>	0.02	0.30	2.00	1.38	1.68
<i>Sphaeralcea coccinea</i>	0.07	1.04	5.00	3.45	4.49
<i>Taraxacum officinale</i>	0.12	1.79	7.00	4.83	6.62
<i>Vicia americana</i>	0.02	0.30	2.00	1.38	1.68

**Table 60. Density Analysis on the Crested Wheatgrass, East Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Density	Relative % Density	% Frequency	Relative % Frequency	Importance Value
<i>Androsace occidentalis</i>	0.08	1.67	5.00	3.79	5.46
<i>Artemisia frigida</i>	0.09	1.88	5.00	3.79	5.67
<i>Aster ericoides</i>	0.02	0.42	1.00	0.76	1.18
<i>Convolvulus arvensis</i>	0.01	0.21	1.00	0.76	0.97
<i>Conyza canadensis</i>	0.07	1.46	6.00	4.55	6.01
<i>Euphorbia geyeri</i>	0.04	0.84	3.00	2.27	3.11
<i>Hedeoma hispida</i>	2.06	43.10	32.00	24.24	67.34
<i>Kochia scoparia</i>	0.01	0.21	1.00	0.76	0.97
<i>Lactuca oblongifolia</i>	0.01	0.21	1.00	0.76	0.97
<i>Lepidium densiflorum</i>	0.09	1.88	6.00	4.55	6.43
<i>Lithospermum incisum</i>	0.01	0.21	1.00	0.76	0.97
<i>Lygodesmia juncea</i>	0.04	0.84	4.00	3.03	3.87
<i>Melilotus officinalis</i>	0.23	4.81	5.00	3.79	8.60
<i>Neslia paniculata</i>	0.11	2.30	4.00	3.03	5.33
<i>Orthocarpus luteus</i>	0.01	0.21	1.00	0.76	0.97
<i>Plantago purshii</i>	1.34	28.03	26.00	19.70	47.73
<i>Polygala alba</i>	0.01	0.21	1.00	0.76	0.97
<i>Potentilla pensylvanica</i>	0.02	0.42	2.00	1.52	1.94
<i>Psoralea argophylla</i>	0.08	1.67	4.00	3.03	4.70
<i>Ratibida columnifera</i>	0.03	0.63	3.00	2.27	2.90
<i>Sphaeralcea coccinea</i>	0.17	3.56	5.00	3.79	7.35
<i>Taraxacum officinale</i>	0.25	5.23	15.00	11.36	16.59

**Table 61. Density Analysis of the Clayey Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Density	Relative Density	% Frequency	Relative % Frequency	Importance Value
<i>Achillea millefolium</i>	0.80	4.43	40.00	8.16	12.59
<i>Androsace occidentalis</i>	1.85	10.25	55.00	11.22	21.47
<i>Arabis holboellii</i>	0.20	1.11	15.00	3.06	4.17
<i>Artemisia dracunculus</i>	0.05	0.28	5.00	1.02	1.30
<i>Artemisia frigida</i>	0.80	4.43	35.00	7.14	11.57
<i>Astragalus canadensis</i>	0.15	0.83	5.00	1.02	1.85
<i>Cerastium arvense</i>	0.05	0.28	5.00	1.02	1.30
<i>Conyza canadensis</i>	9.80	54.29	90.00	18.37	72.66
<i>Erysimum asperum</i>	0.30	1.66	20.00	4.08	5.74
<i>Grindelia squarrosa</i>	0.90	4.99	40.00	8.16	13.15
<i>Hedeoma hispida</i>	0.85	4.71	40.00	8.16	12.87
<i>Helianthus rigidus</i>	0.05	0.28	5.00	1.02	1.30
<i>Lepidium densiflorum</i>	0.05	0.28	5.00	1.02	1.30
<i>Lotus americanus</i>	0.20	1.11	15.00	3.06	4.17
<i>Phlox hoodii</i>	0.30	1.66	15.00	3.06	4.72
<i>Potentilla pensylvanica</i>	0.20	1.11	15.00	3.06	4.17
<i>Psoralea argophylla</i>	0.15	0.83	5.00	1.02	1.85
<i>Ratibida columnifera</i>	0.40	2.21	25.00	5.10	7.31
<i>Sphaeralcea coccinea</i>	0.70	3.88	35.00	7.14	11.02
<i>Taraxacum officinale</i>	0.15	0.83	15.00	3.06	3.89
<i>Vicia americana</i>	0.10	0.55	5.00	1.02	1.57

**Table 62. Density Analysis of the Sandy Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Density	Relative Density	% Frequency	Relative % Frequency	Importance Value
<i>Asclepias viridiflora</i>	0.20	5.13	10.00	5.13	10.26
<i>Artemisia ludoviciana</i>	0.65	16.67	30.00	15.38	32.05
<i>Aster ericoides</i>	1.00	25.64	45.00	23.08	48.72
<i>Cirsium undulatum</i>	0.05	1.28	5.00	2.56	3.84
<i>Echinacea angustifolia</i>	0.60	15.38	10.00	5.13	20.51
<i>Erysimum asperum</i>	0.15	3.85	15.00	7.69	11.54
<i>Helianthus rigidus</i>	0.05	1.28	5.00	2.56	3.84
<i>Liatrix punctata</i>	0.05	1.28	5.00	2.56	3.84
<i>Lygodesmia juncea</i>	0.25	6.41	15.00	7.69	14.10
<i>Oxytropis lambertii</i>	0.05	1.28	5.00	2.56	3.84
<i>Psoralea argophylla</i>	0.10	2.56	5.00	2.56	5.12
<i>Rosa arkansana</i>	0.75	19.23	45.00	23.08	42.31

**Table 63. Density Analysis of the Shallow Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Antennaria parvifolia</i>	0.70	8.92	5.00	1.54	10.46
<i>Artemisia dracunculus</i>	0.70	8.92	30.00	9.23	18.15
<i>Artemisia frigida</i>	0.30	3.82	15.00	4.62	8.44
<i>Aster ericoides</i>	0.45	5.73	25.00	7.69	13.42
<i>Cerastium arvense</i>	0.15	1.91	10.00	3.08	4.99
<i>Echinacea angustifolia</i>	0.45	5.73	35.00	10.77	16.50
<i>Erysimum asperum</i>	0.10	1.27	10.00	3.08	4.35
<i>Euphorbia maculata</i>	0.05	0.64	5.00	1.54	2.18
<i>Grindelia squarrosa</i>	0.35	4.46	20.00	6.15	10.61
<i>Hedeoma hispida</i>	0.15	1.91	15.00	4.62	6.53
<i>Helianthus rigidus</i>	0.25	3.18	15.00	4.62	7.80
<i>Liatris punctata</i>	0.15	1.91	10.00	3.08	4.99
<i>Linum rigidum</i>	0.10	1.27	10.00	3.08	4.35
<i>Lygodesmia juncea</i>	0.65	8.28	20.00	6.15	14.43
<i>Neslia paniculata</i>	0.05	0.64	5.00	1.54	2.18
<i>Penstemon albidus</i>	0.10	1.27	10.00	3.08	4.35
<i>Phlox hoodii</i>	1.45	18.47	35.00	10.77	29.24
<i>Polygala alba</i>	0.10	1.27	10.00	3.08	4.35
<i>Solidago missouriensis</i>	0.65	8.28	5.00	1.54	9.82
<i>Juniperus horizontalis</i>	0.40	5.10	10.00	3.08	8.18
<i>Rosa arkansana</i>	0.40	5.10	15.00	4.62	9.72
<i>Symphoricarpos occidentalis</i>	0.15	1.91	10.00	3.08	4.99

**Table 64. Density Analysis of the Silty Range Site on Native Range, Pasture 1, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.35	1.46	25.00	5.95	7.41
<i>Androsace occidentalis</i>	1.45	6.04	30.00	7.14	13.18
<i>Arabis holboellii</i>	0.30	1.25	20.00	4.76	6.01
<i>Artemisia dracunculus</i>	0.05	0.21	5.00	1.19	1.40
<i>Artemisia frigida</i>	1.15	4.79	40.00	9.52	14.31
<i>Conyza canadensis</i>	16.70	69.58	100.00	23.81	93.39
<i>Descurainia pinnata</i>	0.10	0.42	5.00	1.19	1.61
<i>Erysimum asperum</i>	0.10	0.42	10.00	2.38	2.80
<i>Gaura coccinea</i>	0.10	0.42	5.00	1.19	1.61
<i>Hedeoma hispida</i>	1.40	5.83	55.00	13.10	18.93
<i>Lepidium densiflorum</i>	0.10	0.42	5.00	1.19	1.61
<i>Lotus americanus</i>	0.50	2.08	15.00	3.57	5.65
<i>Neslia paniculata</i>	0.05	0.21	5.00	1.19	1.40
<i>Opuntia fragilis</i>	0.05	0.21	5.00	1.19	1.40
<i>Phlox hoodii</i>	0.15	0.63	5.00	1.19	1.82
<i>Plantago purshii</i>	0.55	2.29	25.00	5.95	8.24
<i>Potentilla pensylvanica</i>	0.25	1.04	10.00	2.38	3.42
<i>Psoralea argophylla</i>	0.10	0.42	10.00	2.38	2.80
<i>Psoralea esculenta</i>	0.05	0.21	5.00	1.19	1.40
<i>Sphaeralcea coccinea</i>	0.45	1.88	35.00	8.33	10.21
<i>Vicia americana</i>	0.05	0.21	5.00	1.19	1.40

**Table 65. Density Analysis of the Clayey Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	1.30	3.56	50.00	9.43	12.99
<i>Androsace occidentalis</i>	0.20	0.55	15.00	2.83	3.38
<i>Arabis holboellii</i>	0.10	0.27	10.00	1.89	2.16
<i>Artemisia dracunculus</i>	0.35	0.96	20.00	3.77	4.73
<i>Artemisia frigida</i>	2.10	5.75	75.00	14.15	19.90
<i>Conyza canadensis</i>	26.50	72.50	100.00	18.87	91.37
<i>Erysimum asperum</i>	0.15	0.41	15.00	2.83	3.24
<i>Grindelia squarrosa</i>	0.65	1.78	30.00	5.66	7.44
<i>Hedeoma hispida</i>	1.05	2.87	50.00	9.43	12.30
<i>Lepidium densiflorum</i>	0.20	0.55	20.00	3.77	4.32
<i>Lotus americanus</i>	0.20	0.55	20.00	3.77	4.32
<i>Opuntia fragilis</i>	0.05	0.14	5.00	0.94	1.08
<i>Orthocarpus luteus</i>	1.60	4.38	20.00	3.77	8.15
<i>Oxytropis lambertii</i>	0.15	0.41	5.00	0.94	1.35
<i>Plantago purshii</i>	0.05	0.14	5.00	0.94	1.08
<i>Potentilla pensylvanica</i>	0.35	0.96	20.00	3.77	4.73
<i>Psoralea argophylla</i>	0.15	0.41	5.00	0.94	1.35
<i>Ratibida columnifera</i>	0.85	2.33	35.00	6.60	8.93
<i>Solidago rigida</i>	0.10	0.27	5.00	0.94	1.21
<i>Sphaeralcea coccinea</i>	0.30	0.82	20.00	3.77	4.59
<i>Taraxacum officinale</i>	0.15	0.41	5.00	0.94	1.35



**Table 66. Density Analysis of the Sandy Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Anemone cylindrica</i>	0.10	1.68	10.00	5.00	6.68
<i>Antennaria parvifolia</i>	1.15	19.33	5.00	2.50	21.83
<i>Artemisia dracunculus</i>	0.75	12.61	15.00	7.50	20.11
<i>Artemisia frigida</i>	0.15	2.52	15.00	7.50	10.02
<i>Artemisia ludoviciana</i>	1.30	21.85	20.00	10.00	31.85
<i>Aster ericoides</i>	0.30	5.04	20.00	10.00	15.04
<i>Chrysopsis villosa</i>	0.15	2.52	5.00	2.50	5.02
<i>Commandra umbellata</i>	0.05	0.84	5.00	2.50	3.34
<i>Erysimum asperum</i>	0.10	1.68	10.00	5.00	6.68
<i>Gaura coccinea</i>	0.15	2.52	15.00	7.50	10.02
<i>Hedeoma hispida</i>	0.45	7.56	25.00	12.50	20.06
<i>Lepidium densiflorum</i>	0.45	7.56	10.00	5.00	12.56
<i>Liatris punctata</i>	0.10	1.68	5.00	2.50	4.18
<i>Lygodesmia juncea</i>	0.05	0.84	5.00	2.50	3.34
<i>Neslia paniculata</i>	0.05	0.84	5.00	2.50	3.34
<i>Oxytropis lambertii</i>	0.15	2.52	5.00	2.50	5.02
<i>Phlox hoodii</i>	0.05	0.84	5.00	2.50	3.34
<i>Psoralea argophylla</i>	0.10	1.68	10.00	5.00	6.68
<i>Solidago missouriensis</i>	0.30	5.04	5.00	2.50	7.54
<i>Sphaeralcea coccinea</i>	0.05	0.84	5.00	2.50	3.34

**Table 67. Density Analysis of the Shallow Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Artemisia dracunculus</i>	0.95	12.93	30.00	9.23	22.16
<i>Artemisia frigida</i>	0.15	2.04	10.00	3.08	5.12
<i>Aster ericoides</i>	0.25	3.40	15.00	4.62	8.02
<i>Astragalus canadensis</i>	0.05	0.68	5.00	1.54	2.22
<i>Erysimum asperum</i>	0.15	2.04	15.00	4.62	6.66
<i>Euphorbia maculata</i>	0.05	0.68	5.00	1.54	2.22
<i>Gaura coccinea</i>	0.05	0.68	5.00	1.54	2.22
<i>Grindelia squarrosa</i>	0.05	0.68	5.00	1.54	2.22
<i>Hedeoma hispida</i>	0.90	12.24	35.00	10.77	23.01
<i>Lepidium densiflorum</i>	0.05	0.68	5.00	1.54	2.22
<i>Linum rigidum</i>	0.20	2.72	20.00	6.15	8.87
<i>Lithospermum incisum</i>	0.05	0.68	5.00	1.54	2.22
<i>Lotus americanus</i>	0.15	2.04	15.00	4.62	6.66
<i>Lygodesmia juncea</i>	0.05	0.68	5.00	1.54	2.22
<i>Oxytropis lambertii</i>	0.55	7.48	15.00	4.62	12.10
<i>Petalostemon purpureum</i>	0.15	2.04	10.00	3.08	5.12
<i>Phlox hoodii</i>	1.05	14.29	30.00	9.23	23.52
<i>Plantago purshii</i>	1.00	13.61	25.00	7.69	21.30
<i>Psoralea argophylla</i>	0.45	6.12	35.00	10.77	16.89
<i>Ratibida columnifera</i>	0.05	0.68	5.00	1.54	2.22
<i>Sphaeralcea coccinea</i>	0.25	3.40	10.00	3.08	6.48
<i>Vernonia fasciculata</i>	0.45	6.12	10.00	3.08	9.20
<i>Vicia americana</i>	0.05	0.68	5.00	1.54	2.22
<i>Rosa arkansana</i>	0.25	3.40	5.00	1.54	4.94

**Table 68. Density Analysis of the Silty Range Site on Native Range, Pasture 2, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.55	1.98	20.00	4.21	6.19
<i>Androsace occidentalis</i>	1.30	4.68	25.00	5.26	9.94
<i>Arabis holboellii</i>	0.05	0.18	5.00	1.05	1.23
<i>Artemisia dracunculus</i>	0.15	0.54	10.00	2.11	2.65
<i>Artemisia frigida</i>	1.65	5.95	60.00	12.63	18.58
<i>Chenopodium album</i>	0.05	0.18	5.00	1.05	1.23
<i>Conyza canadensis</i>	16.65	60.00	85.00	17.89	77.89
<i>Erysimum asperum</i>	0.20	0.72	15.00	3.16	3.88
<i>Grindelia squarrosa</i>	0.15	0.54	10.00	2.11	2.65
<i>Hedeoma hispida</i>	3.15	11.35	65.00	13.68	25.03
<i>Helianthus rigidus</i>	0.05	0.18	5.00	1.05	1.23
<i>Lepidium densiflorum</i>	0.65	2.34	25.00	5.26	7.60
<i>Linum rigidum</i>	0.10	0.36	5.00	1.05	1.41
<i>Lotus americanus</i>	0.15	0.54	10.00	2.11	2.65
<i>Melilotus officinalis</i>	0.10	0.36	10.00	2.11	2.47
<i>Neslia paniculata</i>	0.05	0.18	5.00	1.05	1.23
<i>Plantago purshii</i>	1.55	5.59	35.00	7.37	12.96
<i>Psoralea esculenta</i>	0.05	0.18	5.00	1.05	1.23
<i>Ratibida columnifera</i>	0.40	1.44	25.00	5.26	6.70
<i>Sphaeralcea coccinea</i>	0.70	2.52	45.00	9.47	11.99
<i>Taraxacum officinale</i>	0.05	0.18	5.00	1.05	1.23

**Table 69. Density Analysis of the Clayey Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Androsace occidentalis</i>	0.20	1.06	10.00	2.35	3.41
<i>Antennaria parvifolia</i>	2.45	13.03	15.00	3.53	16.56
<i>Artemisia dracunculus</i>	0.30	1.60	10.00	2.35	3.95
<i>Artemisia frigida</i>	0.10	0.53	5.00	1.18	1.71
<i>Artemisia ludoviciana</i>	0.70	3.72	20.00	4.71	8.43
<i>Aster ericoides</i>	2.00	10.64	45.00	10.59	21.23
<i>Cerastium arvense</i>	0.10	0.53	5.00	1.18	1.71
<i>Echinacea angustifolia</i>	0.10	0.53	10.00	2.35	2.88
<i>Gaura coccinea</i>	0.15	0.80	5.00	1.18	1.98
<i>Grindelia squarrosa</i>	0.05	0.27	5.00	1.18	1.45
<i>Hedeoma hispida</i>	0.80	4.26	20.00	4.71	8.97
<i>Lepidium densiflorum</i>	0.30	1.60	10.00	2.35	3.95
<i>Liatris punctata</i>	0.15	0.80	5.00	1.18	1.98
<i>Lotus americanus</i>	0.15	0.80	10.00	2.35	3.15
<i>Neslia paniculata</i>	0.10	0.53	5.00	1.18	1.71
<i>Orthocarpus luteus</i>	0.40	2.13	20.00	4.71	6.84
<i>Oxytropis lambertii</i>	0.05	0.27	5.00	1.18	1.45
<i>Petalostemon purpureum</i>	0.55	2.93	25.00	5.88	8.81
<i>Phlox hoodii</i>	0.55	2.93	15.00	3.53	6.46
<i>Plantago purshii</i>	6.95	36.97	60.00	14.12	51.09
<i>Polygala alba</i>	0.05	0.27	5.00	1.18	1.45
<i>Psoralea argophylla</i>	0.90	4.79	35.00	8.24	13.03
<i>Ratibida columnifera</i>	0.35	1.86	25.00	5.88	7.74
<i>Solidago missouriensis</i>	0.05	0.27	5.00	1.18	1.45
<i>Solidago rigida</i>	0.05	0.27	5.00	1.18	1.45
<i>Sphaeralcea coccinea</i>	0.20	1.06	15.00	3.53	4.59
<i>Vicia americana</i>	0.10	0.53	10.00	2.35	2.88
<i>Rosa arkansana</i>	0.10	0.53	10.00	2.35	2.88
<i>Symphoricarpos occidentalis</i>	0.85	4.52	10.00	2.35	6.87

**Table 70. Density Analysis of the Sandy Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Androsace occidentalis</i>	0.15	1.82	5.00	1.59	3.41
<i>Artemisia dracunculus</i>	1.10	13.33	45.00	14.29	27.62
<i>Artemisia ludoviciana</i>	0.80	9.70	30.00	9.52	19.22
<i>Aster ericoides</i>	0.40	4.85	20.00	6.34	11.19
<i>Cerastium arvense</i>	0.05	0.61	5.00	1.59	2.20
<i>Erysimum asperum</i>	0.25	3.03	15.00	4.76	7.79
<i>Gaura coccinea</i>	0.05	0.61	5.00	1.59	2.20
<i>Hedeoma hispida</i>	2.70	32.73	45.00	14.29	47.02
<i>Lepidium densiflorum</i>	0.90	10.91	30.00	9.52	20.43
<i>Liatris punctata</i>	0.15	1.82	5.00	1.59	3.41
<i>Lithospermum incisum</i>	0.05	0.61	5.00	1.59	2.20
<i>Neslia paniculata</i>	0.10	1.21	10.00	3.17	4.38
<i>Orthocarpus luteus</i>	0.15	1.82	10.00	3.17	4.99
<i>Oxytropis lambertii</i>	0.35	4.24	25.00	7.94	12.18
<i>Phlox hoodii</i>	0.15	1.82	5.00	1.59	3.41
<i>Plantago purshii</i>	0.35	4.24	10.00	3.17	7.41
<i>Polygala alba</i>	0.05	0.61	5.00	1.59	2.20
<i>Psoralea argophylla</i>	0.10	1.21	10.00	3.17	4.38
<i>Ratibida columnifera</i>	0.15	1.82	10.00	3.17	4.99
<i>Solidago rigida</i>	0.25	3.03	20.00	6.35	9.38

**Table 71. Density Analysis of the Shallow Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Androsace occidentalis</i>	0.05	0.57	5.00	1.27	1.84
<i>Antennaria parvifolia</i>	1.30	14.86	15.00	3.80	18.66
<i>Artemisia dracunculus</i>	0.20	2.29	10.00	2.53	4.82
<i>Artemisia frigida</i>	0.20	2.29	20.00	5.06	7.35
<i>Aster ericoides</i>	1.00	11.43	35.00	8.86	20.29
<i>Astragalus canadensis</i>	0.05	0.57	5.00	1.27	1.84
<i>Commandra umbellata</i>	0.05	0.57	5.00	1.27	1.84
<i>Convolvulus arvensis</i>	0.05	0.57	5.00	1.27	1.84
<i>Conyza canadensis</i>	0.05	0.57	5.00	1.27	1.84
<i>Echinacea angustifolia</i>	0.10	1.14	10.00	2.53	3.67
<i>Erysimum asperum</i>	0.15	1.71	10.00	2.53	4.24
<i>Gaura coccinea</i>	0.30	3.43	20.00	5.06	8.49
<i>Hedeoma hispida</i>	1.75	20.00	60.00	15.19	35.19
<i>Lepidium densiflorum</i>	0.40	4.57	15.00	3.80	8.37
<i>Liatris punctata</i>	0.10	1.14	5.00	1.27	2.41
<i>Linum rigidum</i>	0.10	1.14	10.00	2.53	3.67
<i>Lotus americanus</i>	0.05	0.57	5.00	1.27	1.84
<i>Lygodesmia juncea</i>	0.20	2.29	20.00	5.06	7.35
<i>Opuntia fragilis</i>	0.10	1.14	5.00	1.27	2.41
<i>Oxytropis lambertii</i>	0.50	5.71	15.00	3.80	9.51
<i>Petalostemon purpureum</i>	0.05	0.57	5.00	1.27	1.84
<i>Phlox hoodii</i>	0.70	8.00	30.00	7.59	15.59
<i>Plantago purshii</i>	0.40	4.57	20.00	5.06	9.63
<i>Psoralea argophylla</i>	0.25	2.86	20.00	5.06	7.92
<i>Psoralea esculenta</i>	0.05	0.57	5.00	1.27	1.84
<i>Ratibida columnifera</i>	0.15	1.71	15.00	3.80	5.51
<i>Solidago missouriensis</i>	0.15	1.71	5.00	1.27	2.98
<i>Sphaeralcea coccinea</i>	0.05	0.57	5.00	1.27	1.84
<i>Vernonia fasciculata</i>	0.25	2.86	10.00	2.53	5.39

**Table 72. Density Analysis of the Silty Range Site on Native Range, Pasture 3, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.20	2.65	5.00	1.28	3.93
<i>Androsace occidentalis</i>	0.20	2.65	10.00	2.56	5.21
<i>Arabis holboellii</i>	0.05	0.66	5.00	1.28	1.94
<i>Artemisia dracunculus</i>	0.45	5.96	25.00	6.41	12.37
<i>Artemisia frigida</i>	0.25	3.31	10.00	2.56	5.87
<i>Astragalus canadensis</i>	0.05	0.66	5.00	1.28	1.94
<i>Coryza canadensis</i>	0.50	6.62	35.00	8.97	15.59
<i>Erysimum asperum</i>	0.15	1.99	15.00	3.85	5.84
<i>Gaura coccinea</i>	0.05	0.66	5.00	1.28	1.94
<i>Grindelia squarrosa</i>	0.05	0.66	5.00	1.28	1.94
<i>Hedeoma hispida</i>	2.10	27.81	70.00	17.95	45.76
<i>Lactuca oblongifolia</i>	0.05	0.66	5.00	1.28	1.94
<i>Linum rigidum</i>	0.10	1.32	10.00	2.56	3.88
<i>Lotus americanus</i>	0.10	1.32	10.00	2.56	3.88
<i>Melilotus officinalis</i>	0.05	0.66	5.00	1.28	1.94
<i>Oxytropis lambertii</i>	0.10	1.32	10.00	2.56	3.88
<i>Petalostemon purpureum</i>	0.05	0.66	5.00	1.28	1.94
<i>Phlox hoodii</i>	0.50	6.62	20.00	5.13	11.75
<i>Plantago purshii</i>	0.15	1.99	10.00	2.56	4.55
<i>Polygala alba</i>	0.60	7.95	20.00	5.13	13.08
<i>Psoralea argophylla</i>	0.25	3.31	20.00	5.13	8.44
<i>Psoralea esculenta</i>	0.05	0.66	5.00	1.28	1.94
<i>Ratibida columnifera</i>	0.40	5.30	25.00	6.41	11.71
<i>Sphaeralcea coccinea</i>	0.80	10.60	40.00	10.26	20.86
<i>Taraxacum officinale</i>	0.20	2.65	5.00	1.28	3.93
<i>Vicia americana</i>	0.10	1.32	10.00	2.56	3.88

**Table 73. Density Analysis of the Clayey Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.05	0.27	5.00	0.94	1.21
<i>Androsace occidentalis</i>	0.05	0.27	5.00	0.94	1.21
<i>Antennaria parvifolia</i>	3.20	17.53	20.00	3.77	21.30
<i>Arabis holboellii</i>	0.20	1.10	5.00	0.94	2.04
<i>Artemisia dracuncululus</i>	0.50	2.74	15.00	2.83	5.57
<i>Artemisia frigida</i>	0.25	1.37	15.00	2.83	4.20
<i>Artemisia ludoviciana</i>	0.25	1.37	15.00	2.83	4.20
<i>Aster ericoides</i>	0.80	4.38	25.00	4.72	9.10
<i>Commandra umbellata</i>	0.05	0.27	5.00	0.94	1.21
<i>Echinacea angustifolia</i>	0.25	1.37	10.00	1.89	3.26
<i>Eriogonum multiceps</i>	0.30	1.64	25.00	4.72	6.36
<i>Erysimum asperum</i>	0.10	0.55	10.00	1.89	2.44
<i>Gaura coccinea</i>	0.05	0.27	5.00	0.94	1.21
<i>Gutierrezia sarothrae</i>	0.20	1.10	10.00	1.89	2.99
<i>Hedeoma hispida</i>	1.00	5.48	25.00	4.72	10.20
<i>Hymenoxys richardsonii</i>	0.15	0.82	5.00	0.94	1.76
<i>Liatis punctata</i>	0.20	1.10	5.00	0.94	2.04
<i>Linum rigidum</i>	0.05	0.27	5.00	0.94	1.21
<i>Lotus americanus</i>	0.20	1.10	15.00	2.83	3.93
<i>Oxytropis lambertii</i>	0.05	0.27	5.00	0.94	1.21
<i>Petalostemon purpureum</i>	0.30	1.64	15.00	2.83	4.47
<i>Penstemon albidus</i>	0.15	0.82	5.00	0.94	1.76
<i>Phlox hoodii</i>	1.35	7.40	65.00	12.26	19.66
<i>Plantago purshii</i>	5.00	27.40	70.00	13.21	40.61
<i>Psoralea argophylla</i>	1.25	6.85	55.00	10.38	17.23
<i>Ratibida columnifera</i>	0.15	0.82	15.00	2.83	3.65
<i>Solidago missouriensis</i>	1.10	6.02	10.00	1.89	7.91
<i>Solidago rigida</i>	0.15	0.82	10.00	1.89	2.71
<i>Sphaeralcea coccinea</i>	0.10	0.55	10.00	1.89	2.44
<i>Taraxacum officinale</i>	0.05	0.27	5.00	0.94	1.21
<i>Vicia americana</i>	0.75	4.11	40.00	7.55	11.66



**Table 74. Density Analysis of the Sandy Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Antennaria parvifolia</i>	1.85	33.04	5.00	2.22	35.26
<i>Artemisia dracunculus</i>	0.15	2.68	5.00	2.22	4.90
<i>Artemisia frigida</i>	0.05	0.89	5.00	2.22	3.11
<i>Aster ericoides</i>	0.10	1.79	10.00	4.44	6.23
<i>Astragalus canadensis</i>	0.20	3.57	10.00	4.44	8.01
<i>Chrysopsis villosa</i>	0.15	2.68	5.00	2.22	4.90
<i>Echinacea angustifolia</i>	0.05	0.89	5.00	2.22	3.11
<i>Erysimum asperum</i>	0.10	1.79	10.00	4.44	6.23
<i>Gaura coccinea</i>	0.15	2.68	15.00	6.67	9.35
<i>Grindelia squarrosa</i>	0.05	0.89	5.00	2.22	3.11
<i>Lepidium densiflorum</i>	0.95	16.96	30.00	13.33	30.29
<i>Liatris punctata</i>	0.05	0.89	5.00	2.22	3.11
<i>Linum rigidum</i>	0.05	0.89	5.00	2.22	3.11
<i>Lithospermum incisum</i>	0.20	3.57	20.00	8.89	12.46
<i>Oxytropis lambertii</i>	0.45	8.04	20.00	8.89	16.93
<i>Phlox hoodii</i>	0.05	0.89	5.00	2.22	3.11
<i>Plantago purshii</i>	0.10	1.78	5.00	2.22	4.00
<i>Psoralea argophylla</i>	0.30	5.36	20.00	8.89	14.25
<i>Solidago missouriensis</i>	0.05	0.89	5.00	2.22	3.11
<i>Sphaeralcea coccinea</i>	0.55	9.82	35.00	15.55	25.37

**Table 75. Density Analysis of the Shallow Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
Aster ericoides	0.10	1.68	10.00	3.64	5.32
Commandra umbellata	2.05	34.45	70.00	25.45	59.90
Echinacea angustifolia	0.45	7.56	20.00	7.27	14.83
Erysimum asperum	0.10	1.68	10.00	3.64	5.32
Gaura coccinea	0.05	0.84	5.00	1.82	2.66
Hedeoma hispida	0.30	5.04	5.00	1.82	6.86
Lepidium densiflorum	0.85	14.29	40.00	14.55	28.84
Liatris punctata	0.50	8.40	20.00	7.27	15.67
Linum rigidum	0.15	2.52	15.00	5.45	7.97
Neslia paniculata	0.15	2.52	15.00	5.45	7.97
Oenothera serrulata	0.05	0.84	5.00	1.82	2.66
Opuntia fragilis	0.05	0.84	5.00	1.82	2.66
Petalostemon purpureum	0.10	1.68	10.00	3.64	5.32
Phlox hoodii	0.15	2.52	10.00	3.64	6.16
Polygala alba	0.25	4.20	10.00	3.64	7.84
Psoralea argophylla	0.30	5.04	15.00	5.45	10.49
Rosa arkansana	0.35	5.88	10.00	3.64	9.52

**Table 76. Density Analysis of the Silty Range Site on Native Range, Pasture 4, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Artemisia dracunculus</i>	0.15	1.55	10.00	2.27	3.82
<i>Artemisia frigida</i>	0.10	1.03	10.00	2.27	3.30
<i>Aster ericoides</i>	0.40	4.12	20.00	4.55	8.67
<i>Astragalus canadensis</i>	0.15	1.55	10.00	2.27	3.82
<i>Chenopodium album</i>	0.05	0.52	5.00	1.14	1.66
<i>Echinacea angustifolia</i>	0.80	8.25	40.00	9.09	17.34
<i>Gaura coccinea</i>	0.30	3.09	20.00	4.55	7.64
<i>Grindelia squarrosa</i>	0.05	0.52	5.00	1.14	1.66
<i>Gutierrezia sarothrae</i>	0.05	0.52	5.00	1.14	1.66
<i>Hedeoma hispida</i>	2.40	24.74	70.00	15.91	40.65
<i>Helianthus rigidus</i>	0.15	1.55	5.00	1.14	2.69
<i>Lepidium densiflorum</i>	0.15	1.15	5.00	1.14	2.69
<i>Liatris punctata</i>	0.15	1.55	10.00	2.27	3.82
<i>Linum rigidum</i>	0.10	1.03	10.00	2.27	3.30
<i>Lygodesmia juncea</i>	0.10	1.03	10.00	2.27	3.30
<i>Melilotus officinalis</i>	0.05	0.52	5.00	1.14	1.66
<i>Oxytropis lambertii</i>	0.65	6.70	25.00	5.68	12.38
<i>Phlox hoodii</i>	1.15	11.86	45.00	10.23	22.09
<i>Plantago purshii</i>	0.20	2.06	15.00	3.41	5.47
<i>Polygala alba</i>	0.15	1.55	15.00	3.41	4.96
<i>Psoralea argophylla</i>	0.10	1.03	10.00	2.27	3.30
<i>Psoralea esculenta</i>	0.05	0.52	5.00	1.14	1.66
<i>Ratibida columnifera</i>	0.10	1.03	10.00	2.27	3.30
<i>Solidago missouriensis</i>	0.05	0.52	5.00	1.14	1.66
<i>Solidago rigida</i>	0.05	0.52	5.00	1.14	1.66
<i>Sphaeralcea coccinea</i>	2.00	20.62	60.00	13.64	34.26
<i>Rosa arkansana</i>	0.05	0.52	5.00	1.14	1.66

**Table 77. Density Analysis of the Sandy Range Site on Native Range, Pasture 5, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Artemisia dracunculus</i>	0.25	9.80	15.00	9.68	19.48
<i>Artemisia frigida</i>	0.05	1.96	5.00	3.23	5.19
<i>Artemisia ludoviciana</i>	0.75	29.41	35.00	22.58	51.99
<i>Asclepias viridiflora</i>	0.05	1.96	5.00	3.23	5.19
<i>Aster ericoides</i>	0.55	21.57	25.00	16.13	37.70
<i>Chrysopsis villosa</i>	0.05	1.96	5.00	3.23	5.19
<i>Erysimum asperum</i>	0.15	5.88	10.00	6.45	12.33
<i>Helianthus rigidum</i>	0.20	7.84	15.00	9.68	17.52
<i>Lepidium densiflorum</i>	0.15	5.88	10.00	6.45	12.33
<i>Lygodesmia juncea</i>	0.15	5.88	10.00	6.45	12.33
<i>Orthocarpus luteus</i>	0.05	1.96	5.00	3.23	5.19
<i>Psoralea argophylla</i>	0.10	3.92	10.00	6.45	10.37
<i>Rosa arkansana</i>	0.05	1.96	5.00	3.23	5.19

**Table 78. Density Analysis of the Shallow Range Site on Native Range, Pasture 5, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.10	1.20	5.00	1.04	2.24
<i>Artemisia dracunculus</i>	0.65	7.83	35.00	7.29	15.12
<i>Artemisia frigida</i>	0.30	3.61	20.00	4.17	7.78
<i>Artemisia ludoviciana</i>	0.20	2.41	15.00	3.13	5.54
<i>Aster ericoides</i>	0.80	9.63	35.00	7.29	16.92
<i>Commandra umbellata</i>	0.05	0.60	5.00	1.04	1.64
<i>Echinacea angustifolia</i>	0.65	7.83	35.00	7.29	15.12
<i>Eriogonum flavum</i>	0.05	0.60	5.00	1.04	1.64
<i>Erysimum asperum</i>	0.35	4.22	20.00	4.17	8.39
<i>Euphorbia maculata</i>	0.05	0.60	5.00	1.04	1.64
<i>Gaura coccinea</i>	0.20	2.41	15.00	3.13	5.54
<i>Grindelia squarrosa</i>	0.45	5.42	10.00	2.08	7.50
<i>Gutierrezia sarothrae</i>	0.10	1.20	10.00	2.08	3.28
<i>Hedeoma hispida</i>	0.20	2.41	10.00	2.08	4.49
<i>Helianthus rigidus</i>	0.35	4.22	20.00	4.17	8.39
<i>Lactuca oblongifolia</i>	0.70	8.43	35.00	7.29	15.72
<i>Liatis punctata</i>	0.05	0.60	5.00	1.04	1.64
<i>Linum rigidum</i>	0.05	0.60	5.00	1.04	1.64
<i>Lithospermum incisum</i>	0.10	1.20	10.00	2.08	3.28
<i>Lotus americanus</i>	0.05	0.60	5.00	1.04	1.64
<i>Neslia paniculata</i>	0.05	0.60	5.00	1.04	1.64
<i>Oxytropis lambertii</i>	0.05	0.60	5.00	1.04	1.64
<i>Petalostemon purpureum</i>	0.05	6.02	25.00	5.21	11.23
<i>Phlox hoodii</i>	0.15	1.81	10.00	2.08	3.89
<i>Polygala alba</i>	0.30	3.61	20.00	4.17	7.78
<i>Psoralea argophylla</i>	0.30	3.61	15.00	3.13	6.74
<i>Ratibida columnifera</i>	0.35	4.22	25.00	5.21	9.43
<i>Solidago missouriensis</i>	0.50	0.60	5.00	1.04	1.64
<i>Vicia americana</i>	0.20	2.41	10.00	2.08	4.49
<i>Juniperus horizontalis</i>	0.40	4.82	15.00	3.13	7.95
<i>Rosa arkansana</i>	0.50	6.02	40.00	8.33	14.35

**Table 79. Density Analysis of the Silty Range Site on the Native Range, Pasture 5, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.10	0.53	5.00	1.02	1.55
<i>Androsace occidentalis</i>	0.25	1.34	10.00	2.04	3.38
<i>Artemisia frigida</i>	0.20	1.07	20.00	4.08	5.15
<i>Aster ericoides</i>	0.15	0.80	15.00	3.06	3.86
<i>Chenopodium album</i>	0.10	0.53	10.00	2.04	2.57
<i>Conyza canadensis</i>	2.60	13.90	55.00	11.22	25.12
<i>Echinacea angustifolia</i>	0.15	0.27	5.00	1.02	1.29
<i>Erysimum asperum</i>	0.10	0.53	5.00	1.02	1.55
<i>Hedeoma hispida</i>	1.20	6.42	40.00	8.16	14.58
<i>Helianthus rigidus</i>	0.05	0.27	5.00	1.02	1.29
<i>Lactuca oblongifolia</i>	0.45	2.41	20.00	4.08	6.49
<i>Liatris punctata</i>	0.20	1.07	20.00	4.08	5.15
<i>Linum rigidum</i>	0.05	0.27	5.00	1.02	1.29
<i>Lithospermum incisum</i>	0.05	0.27	5.00	1.02	1.29
<i>Lotus americana</i>	0.15	0.80	15.00	3.06	3.86
<i>Opuntia fragilis</i>	0.05	0.27	5.00	1.02	1.29
<i>Orthocarpus luteus</i>	9.90	52.94	85.00	17.35	70.29
<i>Penstemon albidus</i>	1.20	6.42	45.00	9.18	15.60
<i>Petalostemon purpureum</i>	0.10	0.53	5.00	1.02	1.55
<i>Plantago purshii</i>	0.60	3.21	30.00	6.12	9.33
<i>Potentilla pensylvanica</i>	0.10	0.53	10.00	2.04	2.57
<i>Ratibida columnifera</i>	0.30	1.60	20.00	4.08	5.68
<i>Solidago rigida</i>	0.45	2.41	35.00	7.14	9.55
<i>Sphaeralcea coccinea</i>	0.15	0.80	10.00	2.04	2.84
<i>Vicia americana</i>	0.05	0.27	5.00	1.02	1.29
<i>Selaginella densa</i>	0.10	0.53	5.00	1.02	1.55

**Table 80. Density Analysis of the Sandy Range Site on Native Range, Pasture 6, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Density	Relative Density	% Frequency	Relative % Frequency	Importance Value
<i>Asclepias viridiflora</i>	0.20	5.33	10.00	7.69	13.02
<i>Aster ericoides</i>	0.15	4.00	15.00	11.54	15.54
<i>Artemisia dracunculus</i>	0.45	12.00	20.00	15.38	27.38
<i>Artemisia ludoviciana</i>	1.35	36.00	25.00	19.23	55.23
<i>Lactuca oblongifolia</i>	0.65	17.33	25.00	19.23	35.56
<i>Lepidium densiflorum</i>	0.20	5.33	10.00	7.69	13.02
<i>Liatriis punctata</i>	0.05	1.33	5.00	3.85	5.18
<i>Lygodesmia juncea</i>	0.05	1.33	5.00	3.85	5.18
<i>Opuntia fragilis</i>	0.05	1.33	5.00	3.85	5.18
<i>Phlox hoodii</i>	0.10	2.67	5.00	3.85	6.52
<i>Vernonia fasciculata</i>	0.50	13.33	5.00	3.85	17.18

**Table 81. Density Analysis of the Shallow Range Site on Native Range, Pasture 6, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

Species	Density	Relative Density	% Frequency	Relative % Frequency	Importance Value
<i>Arabis holboellii</i>	0.10	1.27	10.00	2.86	4.13
<i>Artemisia dracunculus</i>	0.65	8.23	25.00	7.14	15.37
<i>Artemisia frigida</i>	0.10	1.27	5.00	1.43	2.70
<i>Aster ericoides</i>	1.20	15.19	30.00	8.57	23.76
<i>Astragalus canadensis</i>	0.35	4.43	10.00	2.86	7.29
<i>Commandra umbellata</i>	0.10	1.27	10.00	2.86	4.13
<i>Echinacea angustifolia</i>	0.05	0.63	5.00	1.43	2.06
<i>Gaura coccinea</i>	0.10	1.27	5.00	1.43	2.70
<i>Grindelia squarrosa</i>	0.25	3.16	25.00	7.14	10.30
<i>Hedeoma hispida</i>	0.30	3.80	20.00	5.71	9.51
<i>Liatriis punctata</i>	0.30	3.80	15.00	4.29	8.09
<i>Linum rigidum</i>	0.05	0.63	5.00	1.43	2.06
<i>Lithospermum incisum</i>	0.05	0.63	5.00	1.43	2.06
<i>Lotus americanus</i>	0.05	0.63	5.00	1.43	2.06
<i>Opuntia fragilis</i>	0.05	0.63	5.00	1.43	2.06
<i>Oxytropis lambertii</i>	1.45	18.35	45.00	12.86	31.21
<i>Petalostemon purpureum</i>	0.30	3.80	15.00	4.29	8.09
<i>Phlox hoodii</i>	1.25	15.82	30.00	8.57	24.39
<i>Plantago purshii</i>	0.05	0.63	5.00	1.43	2.06
<i>Psoralea argophylla</i>	0.10	1.27	5.00	1.43	2.70
<i>Psoralea esculenta</i>	0.05	0.63	5.00	1.43	2.06
<i>Solidago missouriensis</i>	0.20	2.53	5.00	1.43	3.96
<i>Sphaeralcea coccinea</i>	0.10	1.27	10.00	2.86	4.13
<i>Vicia americana</i>	0.70	8.86	50.00	14.29	23.15

**Table 82. Density Analysis of the Silty Range Site on Native Range, Pasture 6, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
<i>Achillea millefolium</i>	0.80	3.47	20.00	3.45	6.92
<i>Androsace occidentalis</i>	1.60	6.94	40.00	6.90	13.84
<i>Artemisia dracunculus</i>	0.70	3.04	15.00	2.59	5.63
<i>Artemisia frigida</i>	0.30	1.30	25.00	4.31	5.61
<i>Artemisia ludoviciana</i>	0.10	0.43	10.00	1.72	2.15
<i>Aster ericoides</i>	0.05	0.22	5.00	0.86	1.08
<i>Conyza canadensis</i>	5.60	24.30	90.00	15.52	39.82
<i>Erysimum asperum</i>	0.15	0.65	15.00	2.59	3.24
<i>Euphorbia maculata</i>	0.05	0.22	5.00	0.86	1.08
<i>Hedeoma hispida</i>	1.50	6.51	50.00	8.62	15.13
<i>Lactuca oblongifolia</i>	0.30	1.30	15.00	2.59	3.89
<i>Lepidium densiflorum</i>	0.75	3.25	15.00	2.59	5.84
<i>Liatris punctata</i>	0.05	0.22	5.00	0.86	1.08
<i>Lotus americanus</i>	0.80	3.47	45.00	7.76	11.23
<i>Neslia paniculata</i>	0.10	0.43	10.00	1.72	2.15
<i>Orthocarpus luteus</i>	5.40	23.43	40.00	6.90	30.33
<i>Penstemon albidus</i>	0.40	1.74	5.00	0.86	2.60
<i>Phlox hoodii</i>	0.50	2.17	5.00	0.86	3.03
<i>Plantago purshii</i>	0.15	0.65	10.00	1.72	2.37
<i>Polygala alba</i>	0.25	1.08	15.00	2.59	3.67
<i>Potentilla pensylvanica</i>	1.40	6.07	60.00	10.34	16.41
<i>Psoralea argophylla</i>	0.05	0.22	5.00	0.86	1.08
<i>Ratibida columnifera</i>	0.30	1.30	25.00	4.31	5.61
<i>Sphaeralcea coccinea</i>	1.75	7.59	50.00	8.62	16.21



**Table 83. Density Analysis on the Altai Wildrye, West Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative % Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
Amaranthus retroflexus	0.42	19.53	10.00	11.36	30.89
Ceratoides lanata	0.10	4.65	4.00	4.55	9.20
Convolvulus arvensis	0.51	23.72	23.00	26.14	49.86
Euphorbia geyeri	0.07	3.26	7.00	7.95	11.21
Kochia scoparia	0.07	3.26	6.00	6.82	10.08
Malva rotundifolia	0.02	0.93	1.00	1.14	2.07
Melilotus officinalis	0.04	1.86	2.00	2.27	4.13
Salsola kali	0.73	33.95	21.00	23.86	57.81
Xanthium strumarium	0.19	8.84	14.00	15.91	24.75

**Table 84. Density Analysis on the Altai Wildrye, East Pasture, for the Complementary Grazing System at the Dickinson Experiment Station, 1983**

<b>Species</b>	<b>Density</b>	<b>Relative % Density</b>	<b>% Frequency</b>	<b>Relative % Frequency</b>	<b>Importance Value</b>
Amaranthus retroflexus	0.19	1.02	7.00	4.96	5.98
Chenopodium album	0.01	0.05	1.00	0.71	0.76
Convolvulus arvensis	1.01	5.42	45.00	31.91	37.33
Conyza canadensis	0.01	0.05	1.00	0.71	0.76
Euphorbia geyeri	0.08	0.43	6.00	4.26	4.69
Helianthus annuus	0.07	0.38	6.00	4.26	4.64
Helianthus rigidus	0.01	0.05	1.00	0.71	0.76
Kochia scoparia	16.47	88.31	28.00	19.86	108.17
Lotus americanus	0.01	0.05	1.00	0.71	0.76
Melilotus officinalis	0.10	0.54	4.00	2.84	3.38
Ranunculus cymbalaria	0.02	0.11	2.00	1.42	1.53
Salsola kali	0.20	1.07	15.00	10.64	11.71
Xanthium strumarium	0.47	2.52	24.00	17.02	19.54

**Table 85. The Rotation Dates and Stocking Pressure Data for the Complementary Rotation Grazing System at the Dickinson Experiment Station, 1983**

Treatment Pasture	Pasture Size In Acres	Dates Grazed	Days In Period	Total Days Grazed	Number of Head	Number of AUM's	Stocking Rate AUM/Acre
<b>WEST SYSTEM</b>							
<b>Untreated</b>							
Crested Wheatgrass	13	11 May – 10 Jun	30	30	16 Cow/calf	15.74	1.21
Native Range					16 Cow/calf		
3 (A)	75	10 Jun – 05 Jul 29 Aug – 16 Sep	25 18	43	1 Bull 16 Cow/calf	23.38	0.31
1 (B)	85	05 Jul – 01 Aug 16 Sep – 03 Oct	27 17	44	16 Cow/calf 1 Bull 16 Cow/calf	23.64	0.28
5 (C)	80	01 Aug – 29 Aug 03 Oct – 20 Oct	28 17	45	16 Cow/calf 16 Cow/calf	23.61	0.30
Altai Wildrye	30	20 Oct – 10 Nov	21	21	16 Cow/calf	11.02	0.37
<b>EAST SYSTEM</b>							
<b>To be Alfalfa Inter-seeded Spring 1984</b>							
Crested Wheatgrass	13	11 May – 10 Jun	30	30	16 Cow/calf	15.74	1.21
Native Range					16 Cow/calf		
4 (A)	75	10 Jun – 05 Jul 29 Aug – 16 Sep	25 18	43	1 Bull 16 Cow/calf	23.38	0.31
2 (B)	80	05 Jul – 01 Aug 16 Sep – 03 Oct	27 17	44	16 Cow/calf 1 Bull 16 Cow/calf	23.64	0.30
6 (C)	80	01 Aug – 29 Aug 03 Oct – 20 Oct	28 17	45	16 Cow/calf 16 Cow/calf	23.61	0.30
Altai Wildrye	30	20 Oct – 10 Nov	21	21	16 Cow/calf	11.02	0.37

**Table 86. Mean Daily Weight Gains for the Calves, Cows, and Bulls on the Complementary Rotation Grazing System  
At the Dickinson Experiment Station, 1983**

Treatment Animal Class	Crested Wheatgrass	Native Range			Altai Wildrye
		A (3-4)	B (1-2)	C (5-6)	
<b>WEST SYSTEM:</b>					
<b>Calf:</b>					
Gain/Day/Head	1.84	2.37	2.31	2.09	1.39
Gain/Day/Acre	2.27	0.51	0.43	0.42	0.74
<b>Cow:</b>					
Gain/Day/Head	3.42	1.48	0.30	0.38	0.33
Gain/Day/Acre	4.21	0.32	0.06	0.08	0.18
<b>Bull:</b>					
Gain/Day/Head		2.16	1.88		
Gain/Day/Acre		0.03	0.02		
<b>EAST SYSTEM:</b>					
<b>Calf:</b>					
Gain/Day/Head	1.67	2.46	2.13	1.93	1.65
Gain/Day/Acre	2.05	0.52	0.43	0.39	0.88
<b>Cow:</b>					
Gain/Day/Head	1.87	2.60	1.74	-1.48	0.69
Gain/Day/Acre	2.30	0.55	0.35	-0.30	0.37
<b>Bull:</b>					
Gain/Day/Head		2.08	3.53		
Gain/Day/Acre		0.03	0.04		

**PLANT SPECIES LIST OF THE COMPLEMENTARY GRAZING SYSTEM,  
DICKINSON EXPERIMENT STATION, 1983**

**Graminoids:**

Ag de	<i>Agropyron desertorum</i>	Crested wheatgrass
Ag sm	<i>Agropyron smithii</i>	Western wheatgrass
Ag tr	<i>Agropyron trachycaulum</i>	Slender wheatgrass
An sc	<i>Andropogon scoparius</i>	Little bluestem
Ar lo	<i>Aristida longiseta</i>	Red threeawn
Av sa	<i>Avena sativa</i>	Oats
Bo cu	<i>Bouteloua curtipendula</i>	Side-oats grama
Bo gr	<i>Bouteloua gracilis</i>	Blue grama
Bu da	<i>Buchloe dactyloides</i>	Buffalo grass
Ca mo	<i>Calamagrostis montanensis</i>	Plains reedgrass
Ca lo	<i>Calamovilfa longifolia</i>	Prairie sandreed
El an	<i>Elymus angustus</i>	Altai wildrye
Ko py	<i>Koeleria pyramidata</i>	Prairie junegrass
Mu cu	<i>Muhlenbergia cuspidata</i>	Plains muhly
Mu sq	<i>Munroa squarrosa</i>	False buffalo grass
Pa ol	<i>Panicum oligosanthos</i>	Scribner panic grass
Po co	<i>Poa compressa</i>	Canada bluegrass
Po pr	<i>Poa pratensis</i>	Kentucky bluegrass
Sc pa	<i>Schedonnardus paniculatus</i>	Tumble grass
Se gl	<i>Setaria glauca</i>	Yellow pigeongrass
Se ve	<i>Setaria verticillata</i>	Bur pigeongrass
Se vi	<i>Setaria viridis</i>	Green pigeongrass
St co	<i>Stipa comata</i>	Needle-and-thread

**Graminoids (Continued):**

St vi	<i>Stipa viridula</i>	Green needlegrass
Ca el	<i>Carex eleocharis</i>	Needleleaf sedge
Ca fi	<i>Carex filifolia</i>	Thread leaved sedge
Ca he	<i>Carex heliophila</i>	Yellow sedge
El spp.	<i>Eleocharis</i> spp.	Spikerush

**Forbs:**

Ac mi	<i>Achillea millefolium</i>	Yarrow
Ag gl	<i>Agoseris glauca</i>	Prairie dandelion
Al ai	<i>Allionia ainearis</i>	Four O'clock
Am re	<i>Amaranthus retroflexus</i>	Rough pigweed
An oc	<i>Androsace occidentalis</i>	Fairy candelabra
An cy	<i>Anemone cylindrica</i>	Cottonweed
An ne	<i>Antennaria neglecta</i>	Pussytoes
An pa	<i>Antennaria parvifolia</i>	Pussytoes
Ar ho	<i>Arabis holboellii</i>	Slim rockcress
Ar dr	<i>Artemisia dracunculus</i>	Green sage
Ar fr	<i>Artemisia frigida</i>	Fringed sage
Ar lu	<i>Artemisia ludoviciana</i>	White sage
As ve	<i>Asclepias verticillata</i>	Whorled milkweed
As vi	<i>Asclepias viridiflora</i>	Green milkweed
As er	<i>Aster ericoides</i>	White prairie aster
As ca	<i>Astragalus canadensis</i>	Little rattlepod
Ce ar	<i>Cerastium arvense</i>	Prairie chickweed
Ce la	<i>Ceratoides lanata</i>	Winter fat
Ch al	<i>Chenopodium album</i>	Lamb's quarters

**Forbs (Continued):**

Ch vi	<i>Chrysopsis villosa</i>	Golden aster
Ci un	<i>Cirsium undulatum</i>	Prairie thistle
Co um	<i>Commandra umbellata</i>	Bastard toadflax
Co ar	<i>Convolvulus arvensis</i>	Field bindweed
Co ca	<i>Conyza canadensis</i>	Horseweed
Co vi	<i>Coryphantha vivipara</i>	Ball cactus
De pi	<i>Descurainia pinnata</i>	Tansy mustard
Ec an	<i>Echinacea angustifolia</i>	Purple coneflower
Er spp.	<i>Erigeron</i> spp.	Daisy fleabane
Er fl	<i>Eriogonum flavum</i>	Yellow umbrella plant
Er mu	<i>Eriogonum multiceps</i>	Eriogonum
Er as	<i>Erysimum asperum</i>	Western wallflower
Eu di	<i>Euphorbia dictyosperma</i>	Spurge
Eu ge	<i>Euphorbia geyeri</i>	Geyer's spurge
Eu ma	<i>Euphorbia maculata</i>	Nodding spurge
Ga co	<i>Gaura coccinea</i>	Gaura
Gr sq	<i>Grindelia squarrosa</i>	Gumweed
Gu sa	<i>Gutierrezia sarothrae</i>	Broomweed
He hi	<i>Hedeoma hispida</i>	Rough pennyroyal
He ri	<i>Helianthus rigidus</i>	Stiff sunflower
Hi vu	<i>Hippuris vulgaris</i>	Marestail
Hy ri	<i>Hymenoxys richardsonii</i>	Rubber plant
Ko sc	<i>Kochia scoparia</i>	Kochia
La ob	<i>Lactuca oblongifolia</i>	Blue wild lettuce
Le de	<i>Lepidium densiflorum</i>	Peppergrass
Li pu	<i>Liatris punctata</i>	Blazing star

**Forbs (Continued):**

Li ri	<i>Linum rigidum</i>	Stiffstem flax
Li in	<i>Lithospermum incisum</i>	Narrow-leaved puccoon
Lo am	<i>Lotus americanus</i>	Prairie bird's foot trefoil
Ly ju	<i>Lygodesmia juncea</i>	Skeleton weed
Ma ro	<i>Malva rotundifolia</i>	Small mallow
Me of	<i>Melilotus officinalis</i>	Yellow sweetclover
Ne pa	<i>Neslia paniculata</i>	Ball mustard
Oe se	<i>Oenothera serrulata</i>	Tooth-leaved evening primrose
Op fr	<i>Opuntia fragilis</i>	Brittle prickly pear
Or lu	<i>Orthocarpus luteus</i>	Owl clover
Ox la	<i>Oxytropis lambertii</i>	Purple loco
Pe al	<i>Penstemon albidus</i>	White beardtongue
Pe pu	<i>Petalostemon purpureum</i>	Purple prairieclover
Ph ho	<i>Phlox hoodii</i>	Moss phlox
Pl pu	<i>Plantago purshii</i>	Woolly plantain
Po al	<i>Polygala alba</i>	White milkwort
Po ar	<i>Polygonum arenastrum</i>	Common knotweed
Po pe	<i>Potentilla pensylvanica</i>	Potentilla
Ps ar	<i>Psoralea argophylla</i>	Silverleaf scurfpea
Ps es	<i>Psoralea esculenta</i>	Indian breadroot
Ra cy	<i>Ranunculus cymbalaria</i>	Seaside buttercup
Ra co	<i>Ratibida columnifera</i>	Long headed coneflower
Sa ka	<i>Salsola kali</i>	Russian thistle
So mi	<i>Solidago missouriensis</i>	Early goldenrod
So ri	<i>Solidago rigida</i>	Stiff goldenrod
Sp co	<i>Sphaeralcea coccinea</i>	Scarlet globemallow

**Forbs (Continued):**

Ta of	<i>Taraxacum officinale</i>	Dandelion
Th rh	<i>Thermopsis rhombifolia</i>	False lupine
Tr du	<i>Tragopogon dubius</i>	Large goat's beard
Ve fa	<i>Vernonia fasciculata</i>	Ironweed
Vi am	<i>Vicia americana</i>	Wild vetch
Vi nu	<i>Viola nuttallii</i>	Nuttall's violet
Xa st	<i>Xanthium strumarium</i>	Cocklebur

**Shrubs:**

Ju ho	<i>Juniperus horizontalis</i>	Creeping juniper
Ro ar	<i>Rosa arkansana</i>	Prairie wild rose
Sy oc	<i>Symphoricarpos occidentalis</i>	Wolfberry

**Lycopods:**

Se de	<i>Selaginella densa</i>	Club moss
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**Eumycota:**

Li spp.	Species of lichens	Lichens
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**LITERATURE CITED**

Heady, H.F. and L. Rader. 1958. Modifications of the Point Frame. *Journal of Range Management* Vol. II (2): 95-96.

Levy, E.B. and E.A. Madden. 1933. The Point Method of Pasture Analysis. *New Zealand Journal of Agriculture* Vol. 46: 267-279.

Smith, Justin G. 1959. Additional Modifications of the Point Frame. *Journal of Range Management* Vol. 12(4): 204-205.

Tinney, F.W., O.S. Aamodt and H.L. Ahlgren. 1937. Preliminary Report of a Study on Methods Used in Botanical Analysis of Pasture Awards. *Journal of the American Society of Agronomy* Vol. 29(10): 835-840.