

Table 1. Summary of climatic data by months for the 1988-89 crop year (Sept. to Aug.) and averages for the period 1909 - 1989 at the Central Agricultural Research Center, Moccasin, Montana.

	Sept. 1988	Oct. 1988	Nov. 1988	Dec. 1988	Jan. 1989	Feb. 1989	Mar. 1989	April 1989	May 1989	June 1989	July 1989	Aug. 1989	Total or Average
Precipitation (inches)													
Current Year	1.78	0.99	0.04	0.77	0.99	0.69	1.23	2.64	1.84	2.44	3.80	3.31	20.52
Average 1909 to 1988-89	1.43	0.87	0.58	0.58	0.59	0.50	0.74	1.13	2.60	3.21	1.65	1.59	15.47
Mean Temperature (0°F)													
Current Year	54.9	49.0	31.6	26.1	21.3	11.9	28.6	39.6	49.4	58.2	68.0	62.6	41.8
Average 1909 to 1988-89	54.2	44.7	32.5	24.4	20.7	24.0	29.7	40.8	50.2	58.0	65.8	64.3	42.4
Last killing frost in Spring													
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
Average 1909 - 1989	-	-	-	-	-	-	-	-	-	-	-	-	-
First killing frost in Fall													
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-	-	-	-	-	-	-
Average 1909 - 1989	-	-	-	-	-	-	-	-	-	-	-	-	-
Frost free period													
1989	-	-	-	-	-	-	-	-	-	-	-	-	-
Average 1909 - 1989	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum summer temperature	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum winter temperature	-	-	-	-	-	-	-	-	-	-	-	-	-

-May 29 (30°F)
-May 26

September 11 (28°F)
September 11 (31°F)

105 days
114 days

93°F on June 7 and 20

-34°F on February 1 and 3

Table 2. Daily and monthly precipitation in inches at the Central Research Center, Moccasin, Montana 1989.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		T	.08							.56	T	
2		.09	.13			.23				.05		
3	.02	.02	.09		.18				.17	.03		
4					T	.35						
5				.05	T						.27	T
6	.15	.11		.24					.05	.01		.07
7	.11			.01						.03		.14
8		.01		.13	.17				.02			
9	.08			.06				T	.03			
10	.09					.06	.27	.17	.20			.08
11			T		.09	.21		T				.01
12						.23						
13		.04			.42	.07	1.63				.15	.07
14		.03	.23		.09		.33	.14			.20	.09
15			.15		.02	.04	.09	.07			.14	.42
16		.03	.20	.02	.03	.62	.02	.30				.04
17		.19	.23	.02	.01	.04	.09					T
18		.01		.03		.05		.02	.53			T
19	T	T			.18			.02	.01			.02
20		T	T			.04		.04				.09
21		T				.03		T				.06
22	.16				.06	.01	.04				.01	T
23	.28			.14	.03	.07		.04				
24	.10		.01	.50		.02	.05	.56		T		
25		.01	T	.18	.01	T		.73		T		
26		T	.03	.21				.05		.12		
27		.09	.03	.48			.11	.76			.19	
28		.06		.57		.37	.68	.21		.04		
29			T		.52					.02		.06
30			.05		.03		.12	.01				.01
31							.37	.19		.10		
Sums	0.99	0.69	1.23	2.64	1.84	2.44	3.80	3.31	1.01	0.96	0.96	1.16
Total												

Table 3. Summary of precipitation and snowfall at the Central Research Center. Moccasin, Montana. 1989.

Month	Precipitation-Inches		Winter Snowfall-Inches*		Yearly Snowfall-Inches		Snow** Depth Inches
	1989	81 Yr. Ave.	1989	28 Yr. Ave.	1988-89	27 Yr. Ave.	
January	0.99	0.59	22.0	13.4	12.0	13.1	12.0
February	0.69	0.50	13.5	7.6	16.0	7.4	8.0
March	1.23	0.74	19.0	11.2	9.0	10.9	14.0
April	2.64	1.13	17.0	8.2	8.5	7.9	8.0
May	1.84	2.60	3.0	1.9	0	1.9	3.0
June	2.44	3.21	0	0			0
July	3.80	1.65	0	0			0
August	3.31	1.59	0	0			0
September	1.01	1.43	1.0	1.0	1.0	1.0	1.0
October	0.96	0.88	4.0	5.5	4.0	5.6	2.0
November	0.96	0.59	10.0	7.5	10.0	7.4	6.0
December	1.16	0.58	23.25	11.6	23.25	11.1	19.0

* Winter Snowfall - Sept. thru May
 ** Highest snow depth during month on ground in 1989

Table 5. Summary of soil temperature at three soil depths under bare ground and sod. Central Research Center - Moccasin, Montana. 1989.

Month	4 inch Soil Depth Bare Ground		8 Inch Soil Depth Bare Ground		20 inch Soil Depth Bare Ground		4 inch Soil Depth Under Sod	
	1989 Mean	24 Yr. Mean	1989 Mean	24 Yr. Mean	1989 Mean	14 Yr. Mean	1989 Mean	24 Yr. Mean
January	34.7	30.9	34.1	30.8	35.2	33.8	33.0	32.1
February	31.3	32.0	30.9	31.4	33.0	32.6	26.6	31.7
March	34.7	36.5	32.7	35.1	31.8	34.4	35.5	37.2
April	44.6	45.6	41.8	43.5	37.9	40.4	45.9	47.2
May	55.4	56.1	52.2	53.8	47.0	48.5	54.6	57.6
June	66.4	66.3	62.4	63.6	54.4	56.1	63.6	66.8
July	77.6	74.1	73.4	71.4	62.9	62.4	73.1	73.8
August	70.0	70.7	67.3	70.1	62.4	63.3	68.3	72.4
September	60.8	60.7	57.6	59.4	55.7	57.8	58.3	61.4
October	48.8	48.4	48.0	47.9	50.2	49.8	49.3	50.0
November	38.5	38.0	38.8	38.3	42.8	42.7	40.3	40.8
December	35.1	33.8	35.2	33.9	36.4	37.3	35.0	35.3

Low and high soil temperature during winter (1988-89) and summer 1989

4 inch bare:	Low 25°F February 12	High 100°F on July 7
8 inch bare:	Low 28°F February 5 and 28	High 86°F on July 7
20 inch bare:	Low 31°F March 5, 7, 8, 13, 15, 16, 22	High 65°F on July 25 - 30
4 inch sod:	Low 16°F February 5	High 88°F on July 29

Dates when soil first froze (32°F) and dates when last thawed (33°F) winter 1988-89

4 inch bare:	Froze November 18	Thawed: March 8
8 inch bare:	Froze November 18	Thawed: March 12
20 inch bare:	Froze February 20	Thawed: March 23
4 inch sod :	Froze November 8	Thawed: March 8

Table 6. Inches of evaporation from a free water surface.
Central Research Center - Moccasin, Montana. 1989.

Month	Water Evap. - Inches		Precipitation - Inches	
	1989	1909-89	1989	1909-89
April	2.20	4.14	2.64	1.13
May	5.67	5.85	1.84	2.60
June	7.25	6.62	2.44	3.21
July	10.99	8.86	3.80	1.65
August	8.02	8.38	3.31	1.59
September	5.89	5.47	1.01	1.43
Total	40.02	39.32	15.04	11.61
Mean	6.67	6.55		

Ratio of Precipitation to Evaporation

1989: 1 inch precipitation to 2.66 evaporation

1909-1989: 3.69 inches

Highest daily evaporation in 1989: 0.56 on July 12 and August 26, 1989