

Table 1: Camelina variety performance under limited irrigation* at the USDA Research Station, Akron Colorado in 2007.

Variety	Oil Profile							
	<u>Test</u>	<u>Height</u>	<u>Yield</u>	<u>Oleic</u>	<u>Linoleic</u>	<u>Linolenic</u>	<u>Erucic</u>	<u>Total</u>
	<u>Weight</u>	<u>inch</u>	<u>lb/ac</u>	<u>(C18:1)</u>	<u>(C18:2)</u>	<u>(C18:3)</u>	<u>(C22:1)</u>	<u>Saturated</u>
	lb/bu	inch	lb/ac	%	%	%	%	%
BSX-G72	48.0	27.7	1725	18.26	19.42	31.89	2.94	11.48
Cheyenne XT	47.6	26.3	1641	18.29	17.88	32.06	3.62	11.02
BSX-G76	47.8	27.3	1632	18.99	20.62	29.76	2.80	11.93
BSX-G51	47.5	25.0	1571	18.95	18.22	30.40	3.66	11.54
BSX-G36	46.3	27.3	1545	17.17	19.00	31.95	3.33	11.69
BSX-G54	49.3	30.0	1539	16.52	20.50	31.16	3.49	11.29
BSX-G53	46.2	24.0	1481	17.02	21.23	29.83	3.22	11.79
BSX-G21	50.5	28.0	1469	15.68	19.97	33.16	3.35	11.29
BSX-G73	48.2	30.0	1435	17.38	20.94	30.27	3.27	11.65
Cheyenne	50.4	24.3	1406	15.95	19.04	32.16	3.87	11.33
BSX-G74	48.7	26.7	1368	17.73	19.22	32.27	3.08	11.36
BSX-G75	49.3	29.0	1356	18.33	19.23	31.64	3.17	11.11
BSX-G37	49.5	27.0	1345	18.19	19.78	31.68	2.87	11.36
BSX-G42	47.7	25.3	1336	18.45	18.97	30.49	3.69	11.33
BSX-G24	48.4	26.0	1316	18.14	17.45	33.27	3.18	11.31
BSX-G44	48.3	26.3	1301	16.49	19.07	32.01	3.75	11.64
BSX-G63	50.8	31.0	1301	16.99	20.20	31.47	3.31	11.66
BSX-G31	49.9	27.7	1202	18.57	17.29	32.35	3.16	11.88
Calena XT	48.7	24.3	1179	17.77	18.92	31.65	3.51	11.43
BSX-G32	48.7	27.7	1176	17.89	20.77	29.98	3.25	11.59
BSX-G71	50.5	30.7	1173	17.09	18.09	33.25	3.33	11.39
Calena	47.2	27.3	1159	15.98	20.36	31.19	3.87	11.54
BSX-G65	48.0	25.0	1141	17.28	20.32	30.91	3.27	11.68
BSX-G33	49.0	25.7	1121	17.83	18.96	30.81	3.64	11.49
BSX-G43	48.2	24.0	1095	16.73	21.51	30.56	3.31	11.35
BSX-G38	48.6	28.3	1048	18.89	18.50	30.80	3.44	11.40
BSX-G23	46.1	25.3	1034	17.52	18.37	32.41	3.25	12.22
BSX-G61	47.4	27.7	1031	18.37	18.25	31.04	3.59	11.50
BSX-G34	48.3	26.0	1025	17.79	18.91	31.49	3.32	11.56
BSX-G79	46.0	29.7	1002	17.72	20.15	30.79	3.25	11.71
BSX-G62	49.2	23.3	973	17.91	23.36	28.22	2.98	11.85
BSX-G66	49.9	26.7	973	17.71	19.77	31.86	3.00	11.42
Celine XT	48.8	26.3	961	17.96	20.93	30.42	2.89	11.80
Celine	47.3	27.3	926	17.61	20.76	30.51	3.00	11.57
BSX-G78	47.0	26.7	900	18.15	20.68	29.04	3.42	11.79
BSX-G77	47.8	26.0	871	17.95	18.97	30.95	3.68	11.30
Average	48.2	27	1243	17.64	19.60	31.21	3.33	11.53
LSD $\alpha=0.30$				0.51	0.64	1.06	0.15	0.25
LSD $\alpha=0.05$	2.78	3.82	611.00	0.98	1.23	2.05	0.29	0.48
CV (%)	2.81	8.73	24.00	2.73	3.09	3.24	4.25	2.04

*Limited irrigation total water received (precipitation plus irrigation) = 10.08 inches

Date of planting 5/12/2007

Date of harvest: 7/24/2007

Previous Crop: wheat

Fertilizer: 50-0-0

Herbicide: Sonalan (2pint/ac)

Insecticide: 2xMustang (2pints/ac)

Plot Size: 5ft x 15ft

Seeding Rate: 6lbs/ac

**Oil Profile Key:

Most desirable oil for biofuel is one with a long carbon chain and one double bond which will have lower cloud point (solidify), lower viscosity, more lubricity and more complete combustion.

1. Oleic fatty acid, C18:1: Fatty acid a chain of 18 carbons and one double bond. It has the formula $C_{18}H_{34}O_2$ (or $CH_3(CH_2)_7CH=CH(CH_2)_7COOH$). This is the main monounsaturated fatty acid for high stability, better engine performance and health benefits.
2. Linoleic fatty acid C18:2: chain of 18 carbons and two double bonds, more common name is Omega 6 with more health benefits than C18:1.
3. Linolenic fatty acid, C18:3: Chain of 18 carbons and 3 double bonds, more common name is omega 3 with good health properties but more unstable over time due to the instability of the double bonds.
4. Erucic fatty acid, C22:1: Chain of 22 carbons and 1 double bond. Erucic acid has negative health properties especially in the meal. A level below 5% of the oil content is tolerated.
5. Total saturated fatty acid: Variable carbons chain length with no double bond which will have a higher cloud point and so will melt at higher temperatures.

Table 2: Camelina variety performance under dryland* at the USDA Research Station, Akron Colorado in 2007.

Variety	Oil Profile							
	<u>Test Weight</u>	<u>Height</u>	<u>Yield</u>	<u>Oleic</u>	<u>Linoleic</u>	<u>Linolenic</u>	<u>Erucic</u>	<u>Total</u>
	lb/bu	inch	lb/ac	(C18:1) %	(C18:2) %	(C18:3) %	(C22:1) %	Saturated %
Calena	49.9	26.3	1138	18.26	20.69	28.57	3.87	12.29
BSX-G21	49.4	23.3	1022	18.67	22.46	28.18	3.35	12.26
BSX-G73	48.4	29.3	1009	19.33	23.26	26.65	3.27	12.91
BSX-G44	49.8	23.3	995	18.77	20.80	28.65	3.75	12.46
BSX-G43	49.2	26.3	976	18.62	24.08	26.28	3.31	12.82
Cheyenne XT	48.2	25.3	974	21.13	20.53	26.55	3.62	12.25
BSX-G54	50.3	27.0	929	18.29	22.08	28.62	3.49	12.13
Cheyenne	48.7	25.0	925	21.12	20.95	26.23	3.87	12.55
BSX-G53	49.3	23.3	922	18.54	25.06	25.08	3.22	13.52
BSX-G65	50.0	27.7	918	19.58	22.87	27.90	3.27	12.51
BSX-G72	49.7	26.7	900	20.32	21.97	27.14	2.94	12.73
Calena XT	50.1	26.0	892	18.66	21.59	28.26	3.51	12.48
BSX-G33	48.6	22.3	862	20.78	20.50	27.12	3.64	12.39
BSX-G31	51.2	24.3	860	21.50	19.42	28.58	3.16	12.49
BSX-G77	48.5	23.7	813	20.83	19.84	27.44	3.68	12.31
BSX-G34	50.8	24.3	802	20.25	20.54	28.68	3.32	12.45
BSX-G51	48.2	22.0	786	22.12	20.07	26.24	3.66	12.68
BSX-G37	50.4	26.0	780	20.39	20.91	28.26	2.87	12.59
BSX-G23	50.9	26.0	774	18.92	20.23	30.12	3.25	12.45
BSX-G24	51.2	23.3	757	21.04	19.44	29.01	3.18	12.33
BSX-G76	51.0	26.0	736	20.50	21.11	28.23	2.80	12.24
Celine	49.3	25.0	726	19.43	22.01	28.32	3.00	12.22
BSX-G71	51.1	24.3	724	18.64	19.65	30.79	3.33	12.52
BSX-G66	50.4	22.7	712	19.73	20.97	28.90	3.00	12.37
BSX-G42	48.7	25.3	712	21.06	20.74	26.33	3.69	12.31
BSX-G63	50.0	28.0	701	19.53	21.57	28.64	3.31	12.31
BSX-G36	50.5	22.7	697	20.05	20.83	29.01	3.33	12.02
BSX-G78	49.4	25.0	678	19.76	22.99	26.20	3.42	12.71
BSX-G61	48.8	21.7	674	21.73	20.10	26.82	3.59	12.42
BSX-G79	48.7	26.0	674	20.30	22.82	26.49	3.25	12.51
BSX-G75	50.8	25.3	633	20.25	19.80	29.19	3.17	12.04
BSX-G32	49.5	22.3	631	19.39	22.32	27.54	3.25	12.59
Celine XT	49.8	26.3	631	19.26	21.90	28.60	2.89	12.36
BSX-G74	50.1	25.7	620	19.38	20.82	29.78	3.08	12.52
BSX-G38	48.0	22.7	529	21.85	19.83	26.61	3.44	12.28
BSX-G62	41.8	21.7	281	19.39	25.39	24.57	2.98	13.06
Average	49.5	24.8	789	19.93	21.39	27.77	2.84	12.47
LSD $\alpha=0.3$				0.29	0.48	0.63	0.12	0.23
LSD $\alpha=0.05$	1.58	3.81	270.00	0.56	0.92	1.20	0.23	0.43
CV (%)	1.84	9.46	21.00	1.72	2.63	2.66	5.03	2.13

*Total precipitations = 7.58 inches

Date of planting: 5/10/2007
 Date of harvest: 7/10/2007
 Previous Crop: Barley
 Fertilizer: 40-0-0
 Herbicide: Sonalan (2pint/ac)
 Insecticide: Mustang (2pints/ac)
 Plot Size: 5ft x 15 ft
 Seeding Rate: 4lbs/ac

Table 3: Camelina variety performance under limited irrigation* at the Nutri-Turf farm, Fort Collins, Colorado, in 2007.

Variety	Test Weight lb/bu	Yield lb/ac	Oil Profile				
			Oleic (C18:1) %	Linoleic (C18:2) %	Linolenic (C18:3) %	Erucic (C22:1) %	Total Saturated %
BSX-G61	43.9	839	19.29	19.69	28.38	3.02	13.02
BSX-G31	45.5	789	18.52	19.02	30.48	3.00	12.44
BSX-G37	40.9	734	17.40	20.11	30.26	2.81	13.25
BSX-G43	43.3	701	16.06	22.43	29.67	2.96	12.91
BSX-G23	42.6	699	16.56	19.39	32.14	3.06	12.72
BSX-G34	42.9	692	17.53	19.79	30.58	2.92	12.80
BSX-G79	44.0	677	17.84	22.21	27.90	2.83	13.48
BSX-G21	44.8	669	16.17	20.64	31.41	3.06	12.67
Calena	42.6	669	16.18	19.63	31.36	3.40	12.44
BSX-G54	43.2	641	16.36	21.49	29.31	3.19	12.96
BSX-G33	43.6	630	18.17	19.56	29.32	3.33	12.71
BSX-G38	42.7	627	18.59	18.80	29.55	3.47	12.49
BSX-G51	41.4	613	18.63	19.25	28.70	3.43	13.03
Cheyenne	43.6	603	18.13	19.42	29.39	3.41	12.68
BSX-G65	45.5	592	16.64	21.69	30.03	2.88	12.95
BSX-G75	41.2	568	16.96	19.72	31.39	2.93	12.72
BSX-G42	43.8	551	18.64	19.91	28.52	3.51	12.68
BSX-G24	46.9	551	18.08	19.14	30.63	2.89	12.98
BSX-G72	45.7	542	17.65	20.66	29.79	2.80	13.20
BSX-G78	43.7	519	17.06	21.25	29.13	3.32	12.84
BSX-G77	43.3	510	17.91	19.77	29.89	2.99	12.89
Cheyenne XT	43.9	504	18.65	20.10	28.72	3.39	12.75
BSX-G63	42.9	502	16.45	21.41	29.27	3.17	13.41
BSX-G53	42.6	490	16.77	23.95	26.64	2.86	13.64
Calena XT	43.3	470	16.46	19.52	30.74	3.34	12.88
BSX-G73	37.5	459	17.25	21.77	29.52	2.68	12.98
BSX-G32	42.2	426	17.56	21.54	29.19	2.88	12.72
BSX-G76	40.9	426	17.87	20.89	29.19	2.67	13.54
BSX-G66	39.2	422	16.92	20.48	30.41	2.87	13.02
BSX-G71	40.6	420	16.69	19.50	31.79	2.82	13.21
BSX-G36	42.6	399	17.07	20.22	31.28	3.09	12.47
Celine	35.7	379	16.56	21.85	29.92	2.63	13.28
Celine XT	37.5	374	16.62	21.15	30.02	2.89	13.26
BSX-G74	43.3	368	17.35	19.82	30.60	3.04	13.04
BSX-G44	37.6	360	16.92	19.64	29.95	3.46	13.02
BSX-G62	41.6	283	17.15	22.19	28.55	2.89	13.28
Average	42.4	547	17.33	20.50	29.84	3.05	12.95
LSD $\alpha=0.3$			0.50	0.46	0.66	0.16	0.41
LSD $\alpha=0.05$	5.39	287	0.96	0.88	1.27	0.30	0.78
CV (%)	7.8	32	3.40	2.65	2.6	6.04	3.72

*Total water received (precipitation plus irrigation) = 13.7 inches

Date of planting:	5/14/2007	<u>Observations</u>	Very slow emergence, (3 weeks to a month) and cool soil temperatures
Date of harvest:	7/24/2007		
Row spacing	7.5 inches	<u>Comments:</u>	The planting depth was too deep
Previous Crop:	corn		The seeding rate too low (6 lbs/ac).
Fertilizer:	None		Compaction occurred from the the planter wheels
Herbicide:	Sonalan (4 pints/ac)		A thick crust due to very high soil sodium content
Insecticide:	Mustang (2pints/ac)	<u>Recommendations:</u>	Increase seeding rate
Plot Size:	5ft x 15ft		Choose a field with lower sodium content
Seeding Rate:	4lbs/ac		Shallow planting depth

Table 4: 2007 Nutri-Turf Soil Analysis for Sodium and Nitrogen Content from Olsen's Agricultural Laboratory, Nebraska.

Crops	Depth	pH	Nitrate-N lbs/ac	Bicarb-P ppm	SAR*
Oilseed	0-6	8.3	66	99	13.63
	6-12		84		17.03
Canola	0-6	8.5	93	92	18.89
	6-12		100		19
Soybean	0-6	8.1	108	128	17.59
	6-12		172		18.59
Camelina	0-6	8.1	123	107	12.9
	6-12		132		14.85
Safflower	0-6	8.3	99	128	15.54
	6-12		89		17.26

*Sodium Adsorption Ratio