

**PROPOSED SAFFLOWER CULTIVARS FOR CONSIDERATION AT
THE 2007 VARIETY RELEASE AND RECOMMENDATION
MEETING**

*Submitted by
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95B 7446 Safflower

- I. Consider for safflower variety release as a protected licensed variety by the Montana Agricultural Experiment Station: 95B7446

- II. Consider for addition to the Montana Dryland and Irrigated Safflower Recommended List as a specialty high oleic safflower variety for the safflower oil and birdseed markets

Origin and Breeding History of 95B7446

95B7446 was derived from a single F₆ plant selection of a cross between the high linoleic Montana breeding line 89B1312 and safflower variety Montola 2000.

Recurrent selection for high oleic fatty acid composition, *Alternaria* leaf spot resistance, high test weight and greater plant height was practiced in the breeding of 95B7446. Gas chromatography determinations for oil quality were made each generation to select for an oleic fatty acid (C18:1) oil composition of over 80%.

95B7446 is a high oleic safflower intended for use in the specialty birdseed markets. Its release will provide a specialty high oleic birdseed variety with normal white hull, improved *Alternaria* leaf spot resistance and higher test weight than Montola 2000.

95B7446 is considered a dual purpose variety for the birdseed market and for the high oleic safflower oil markets, because of its high oleic fatty acid content. 95B7446 has higher seed yielding ability, higher test weight, greater plant height and lower seed oil content than Montola 2000.

The flower color of 95B7446 is yellow in the bloom stage and orange in the wilt stage. 95B7446 plants are spiny with spines on the tip and along margins of the leaves and involucral bracts.

2006 Dryland Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	15.7	62.0	57	43.5	39.0	635	1629
95B 7446	15.7	62.3	63	43.3	37.9	572	1509
Finch	16.3	60.0	53	45.3	38.4	575	1500
Montola 2000	15.3	50.7	68	41.5	40.8	637	1563
Montola 2003	15.0	52.3	67	42.8	39.5	526	1333
LSD (0.05)	1.49	5.74	8.52	0.63	1.11	106.1	275.3
CV (S/mean)	3.39	3.56	4.87	0.53	0.99	6.27	6.45

2005 Dryland Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	27.0	71.3	82	44.2	37.2	728	1955
95B 7446	26.3	65.7	78	44.0	37.6	630	1680
Finch	27.3	59	68	46.2	36.9	490	1325
Montola 2000	25.3	51.7	72	42.5	39.9	614	1538
Montola 2003	26.7	59.7	78	43.0	40.3	690	1706
LSD (0.05)	1.74	6.67	10.25	0.71	1.27	146.1	356.8
CV (S/mean)	2.32	3.74	5.03	0.59	1.15	7.91	7.56

2004 Dryland Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	29.0	80	88	40.5	34.9	803	1979
95B 7446	29.0	75	86	41.6	34.2	835	2007
Finch	29.0	76	83	42.3	35.6	725	1713
Montola 2000	29.0	72	84	38.3	38.3	566	1475
Montola 2003	31.0	71	89	41.0	41.0	733	1784
LSD (0.05)	1.60	9.30	6.30	1.21	0.73	83.8	200.0
CV (S/mean)	0.30	4.5	2.70	1.10	0.71	4.60	4.30

2004– 2006 Average Dryland Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	23.9	71.1	75.7	42.7	37.0	722	1854
95B 7446	23.7	67.7	75.7	43.0	36.6	679	1732
Finch	24.2	65.0	68.0	44.6	37.0	597	1513
Montola 2000	23.2	58.1	74.7	40.8	39.7	606	1525
Montola 2003	24.2	61.0	78.0	42.3	40.3	650	1608

2006 Irrigated Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A	Disease Rating ¹
95B 3538	17.0	72	69	44.0	38.9	1369	3521	6.3
95B 7446	16.7	67	77	43.3	37.7	1248	3305	6.8
Finch	17.0	70	58	44.7	38.9	1011	2592	5.7
Montola 2000	17.0	57	75	40.5	40.2	1341	3326	6.5
Montola 2003	17.0	60	80	43.3	39	1388	3548	6.7
LSD (0.05)	1.07	6.88	10.6	1.85	1.19	241.0	546.7	1.38
CV (S/mean)	2.27	3.73	5.41	1.54	1.07	6.74	6.00	7.97

2005 Irrigated Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A	Disease Rating ¹
95B 3538	22.7	70	98	40.2	34.5	806	2258	5.8
95B 7446	22.0	74	100	39.5	36.4	951	2578	6.3
Finch	22.3	81	100	41.2	35.3	703	1931	5.8
Montola 2000	20.0	62	98	35.5	37.2	626	1650	7.2
Montola 2003	21.3	71	100	38.7	36.7	798	2139	6.7
LSD (0.05)	1.40	8.18	1.66	1.80	2.58	179.5	401.1	.69
CV (S/mean)	2.33	4.11	2.88	1.64	2.43	8.07	6.83	3.88

2004 Irrigated Safflower, Sidney, Montana

Variety	Bloom Date(Aug)	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A	Disease Rating ¹	Disease Rating ²
95B 3538	6.0	94	78	31.8	31.5	736	1749	4	3.5
95B 7446	5.0	93	83	31.0	30.1	710	1350	6	19.0
Finch	4.0	92	78	31.5	29.3	218	718	7	35.0
Montola 2000	4.0	84	87	29.2	30.1	169	558	7	32.5
Montola 2003	6.0	88	90	30.8	31.5	430	1336	7	6
LSD (0.05)	1.0	10.5	5.8	2.49	3.23	214.7	575.4		
CV (S/mean)	.2	4.2	2.5	2.93	3.57	21.6	19.3		

2004– 2006 Average Irrigated Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A	Disease Rating ¹
95B 3538	25.6	78.7	81.7	38.7	35.0	970	2509	5.4
95B 7446	24.9	78.0	86.7	37.9	34.7	970	2411	6.4
Finch	24.8	81.0	78.7	39.1	34.5	644	1747	6.2
Montola 2000	24.0	67.7	86.7	35.1	35.8	712	1845	6.9
Montola 2003	25.1	73.0	90.0	37.6	35.7	872	2341	6.8

1/ Alternaria leafspot rating of 1-9 , 9 being most susceptible

2/ Sclerotinia head rot, % heads infected (10/12/2004)

2006 Recrop Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	12.7	48	72	43.3	38.1	377	987
95B 7446	13.0	51	63	43.0	38.3	329	861
Finch	13.3	50	49	45.3	39.3	352	892
Montola 2000	12.7	44	62	41.5	40.1	334	834
Montola 2003	13.3	50	70	42.8	39.3	354	902
LSD (0.05)	2.20	8.50	16.33	1.095	1.022	116.7	288.3
CV (S/mean)	5.56	6.33	6.50	.918	.916	11.77	11.77

2005 Recrop Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	20.0	68	80	42.2	35.8	381	1063
95B 7446	21.3	59	77	42.3	36.3	423	1161
Finch	20.0	61	77	44.8	36.1	371	1029
Montola 2000	19.3	54	67	40.5	38.9	359	921
Montola 2003	21.3	60	78	41.2	37.7	435	1150
LSD (0.05)	2.58	9.41	8.38	.80	.80	102.1	257.7
CV (S/mean)	4.48	5.80	3.99	.69	.74	9.49	9.15

2004 Recrop Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	23.0	41	81	41.0	34.5	302	877
95B 7446	24.0	53	81	42.4	34.8	369	1054
Finch	24.0	55	76	43.0	34.6	286	822
Montola 2000	23.0	47	74	38.4	36.2	308	839
Montola 2003	24.0	47	80	41.3	35.3	303	848
LSD (0.05)	1.4	11.1	8.1	1.34	1.68	136.2	352.4
CV (S/mean)	.2	7.8	3.8	1.21	1.61	14.6	14.0

2004– 2006 Average Recrop Safflower, Sidney, Montana

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	18.6	52.3	77.7	42.2	36.1	353	976
95B 7446	19.4	54.3	73.7	42.6	36.5	374	1025
Finch	19.1	55.3	67.3	44.4	36.7	336	914
Montola 2000	18.3	48.3	67.7	40.1	38.4	334	865
Montola 2003	19.5	52.3	76.0	41.8	37.4	364	967

2006 Dryland Safflower, Huntley, Montana

Variety	Bloom Date(July)	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	9.0	27.8		40.2	37.8	473	1361
95B 7446	8.0	28.1		39.2	39.9	474	1292
Finch	8.0	27.7		40.7	36.7	456	1352
Montola 2000	6.0	24.3		37.6	41.9	552	1431
Montola 2003	8.0	25.3		38.8	40.5	421	1130
LSD (0.05)	1.20	1.7		.90	.60	68.6	178.2
CV (S/mean)	.5	4.5		1.60	1.10	10.2	9.80

2005 Dryland Safflower, Huntley, Montana

Variety	Bloom Date(June)	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	25	28.1		38.4	33.5	271	877
95B 7446	28	25.7		40.2	36.0	325	981
Finch	28	26.8		41.5	32.4	298	990
Montola 2000	24	35.1		38.4	38.1	353	1008
Montola 2003	29	29.0		39.2	36.3	282	842
LSD (0.05)	2.58	2.0		1.0	1.20	60.2	169.0
CV (S/mean)	4.48	5.60		14.1	2.50	9.49	14.1

2004 Dryland Safflower, Huntley, Montana

Variety	Bloom Date(July)	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	20	26.5		42.5	33.1	293	967
95B 7446	19	25.9		42.1	34.1	285	906
Finch	19	24.2		41.8	35.2	202	624
Montola 2000	19	20.6		39.7	38.0	193	548
Montola 2003	20	22.3		40.2	33.8	157	509
LSD (0.05)	.8	3.3		2.2	2.1	ns	336.1
CV (S/mean)	.3	9.7		3.8	4.2	36	36.5

2004– 2006 Average Dryland Safflower, Huntley, Montana

Variety	Bloom Date	Height Inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	8.0	27.5		40.4	34.8	346	1068
95B 7446	8.3	26.6		40.5	36.7	361	1060
Finch	8.3	26.2		41.3	34.8	319	989
Montola 2000	6.3	26.7		38.6	39.3	366	996
Montola 2003	9.0	25.5		39.4	36.9	287	827

2006 Dryland Safflower, Havre, Montana

Variety	Bloom Date	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	16.3	26.4	97.4	42.8	35.1	473	1361
95B 7446	16.7	23.8	94.2	42.4	36.9	474	1292
Finch	15.7	25.7	91.7	44.8	38.6	456	1352
Montola 2000	13.3	22.8	99.5	40.0	38.8	552	1431
Montola 2003	14.3	24.4	98.1	41.8	37.9	421	1130
LSD (0.05)	4.78	2.96	4.24	1.48	3.81	68.6	118.4
CV (S/mean)	.87	4.32	1.57	1.26	3.83	10.2	11.73

2005 Dryland Safflower, Havre, Montana

Variety	Bloom Date	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	32.0	22.5	73.1	42.3	36.8	411	1216
95B 7446	30.7	21.7	77.8	42.1	37.8	425	1223
Finch	27.7	21.6	85.4	42.2	38.1	424	1214
Montola 2000	28.0	19.8	82.2	39.7	41.2	440	1160
Montola 2003	27.3	21.0	81.7	41.9	39.3	443	1226
LSD (0.05)	1.22	3.20	13.34	1.07	.78	72.1	194.9
CV (S/mean)	.21	5.29	6.03	.93	.70	6.00	5.88

2004 Dryland Safflower, Havre, Montana

Variety	Bloom Date	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	33.0	25.8	95.3	43.5	37.8	388	1113
95B 7446	31.3	25.4	94.8	44.3	37.8	427	1230
Finch	31.3	29.0	92.7	43.0	37.5	440	1277
Montola 2000	30.7	24.8	94.8	39.5	40.5	415	1113
Montola 2003	29.3	26.3	95.8	40.8	38.0	388	1110
LSD (0.05)	3.38	3.41	5.11	3.71	.74	103.6	284.5
CV (S/mean)	.56	4.59	1.92	3.17	.66	8.59	8.65

2004– 2006 Average Dryland Safflower, Havre, Montana

Variety	Bloom Date	Height Inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	27.1	24.9	88.6	42.9	36.6	424	1230
95B 7446	26.2	23.6	88.9	42.9	37.5	442	1248
Finch	24.9	25.4	89.9	43.3	38.1	440	1281
Montola 2000	24.0	22.5	92.2	39.7	40.2	469	1235
Montola 2003	23.6	23.9	91.9	41.5	38.4	417	1155

2006 Dryland Safflower, Moccasin, Montana

Variety	% Bloom July 21	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	1.3	66.3		42.0	37.1	207	557
95B 7446	6.5	66.0		42.3	35.9	195	542
Finch	1.8	66.3		43.5	37.2	209	560
Montola 2000	9.5	63.8		40.3	39.1	262	669
Montola 2003	1.3	67.3		41.3	35.4	192	542
LSD (0.05)	3.96	5.72		.99	1.36	64.6	160.6
CV (S/mean)	60.5	6.09		1.73	2.61	23.2	21.5

2005 Dryland Safflower, Moccasin, Montana

Variety	% Bloom Aug 4	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	56.7	69.8		41.8	34.5	297	709
95B 7446	73.3	59.5		41.9	34.7	310	740
Finch	38.3	72.3		43.9	34.5	378	862
Montola 2000	83.7	60.5		38.6	39.1	337	872
Montola 2003	48.3	62.5		40.6	35.6	358	876
LSD (0.05)	16.96	6.02		.96	1.4	99.5	231
CV (S/mean)	16.24	6.47		1.69	2.6	23	21.9

2004 Dryland Safflower, Moccasin, Montana

Variety	% Bloom Aug 4	Height inch	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	3.0	30.3		41.1	37.8	388	1113
95B 7446	7.0	31.5		43.3	37.8	427	1230
Finch	5.0	31.0		43.6	37.5	440	1277
Montola 2000	11.3	28.0		41.2	40.5	415	1113
Montola 2003	1.5	27.5		42.8	38.0	388	1110
LSD (0.05)	3.38	3.41		3.71	.74	103.6	284.5
CV (S/mean)	.56	4.59		3.17	.66	8.59	8.65

2004– 2006 Average Dryland Safflower, Moccasin, Montana

Variety	% Bloom Aug 4	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	20.3	55.5	0.0	41.6	36.5	297	793
95B 7446	28.9	52.3	0.0	42.5	36.1	311	837
Finch	15.0	56.5	0.0	43.7	36.4	342	900
Montola 2000	34.8	50.8	0.0	40.0	39.6	338	885
Montola 2003	17.0	52.4	0.0	41.6	36.3	313	843

2006 Dryland Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	13	52.8		43.0	35.4		1215
95B 7446	11	48.5		42.9	35.0		1201
Finch	13	50.3		45.4	36.0		1075
Montola 2000	13	46.0		41.4	38.2		1132
Montola 2003	13	46.5		42.1	36.6		1084
LSD (0.05)	.9	4.6		.6	.5		104
CV (S/mean)	.8	6.8		.7	.7		6.6

2005 Dryland Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	19	67.5		41.8	34.5		1797
95B 7446	17	60.5		41.8	34.5		1605
Finch	17	62.0		44.9	35.3		1385
Montola 2000	17	49.8		40.0	36.9		1209
Montola 2003	19	55.0		41.2	35.2		1426
LSD (0.05)	.8	2.5		1.0	1.1		138
CV (S/mean)	.7	7.6		.8	.8		6.8

2004 Dryland Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	28	56.5		40.9	33.9		1554
95B 7446	27	54.3		42.0	31.7		1293
Finch	27	54.8		44.0	33.9		1275
Montola 2000	27	48.0		38.7	32.7		1008
Montola 2003	28	54.8		41.1	34.3		1293
LSD (0.05)	NS	5.8		.9	1.7		126
CV (S/mean)	8.6	7.7		1.3	2.4		7.5

2004– 2006 Average Dryland Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	20.0	58.9		41.9	34.6	522	1522
95B 7446	18.3	54.4		42.2	33.7	459	1366
Finch	19.0	55.7		44.8	35.1	433	1245
Montola 2000	19.0	47.9		40.0	35.9	398	1116
Montola 2003	20.0	52.1		41.5	35.4	442	1268

2006 Recrop Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	15	53.3		44.0	34.9		1086
95B 7446	14	45.5		43.1	35.4		1250
Finch	14	49.0		45.5	35.8		1164
Montola 2000	15	41.3		41.2	38.5		1084
Montola 2003	14	44.8		42.5	36.7		1000
LSD (0.05)	.8	5.1		.7	.6		124
CV (S/mean)	.9	7.7		.8	.8		8.0

2005 Recrop Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538	18	67.5		43.5	43.5		1268
95B 7446	18	60.5		42.7	42.7		1039
Finch	18	62.0		44.9	44.9		1215
Montola 2000	18	49.8		40.8	37.5		968
Montola 2003	18	55.0		41.9	35.5		1096
LSD (0.05)	1	7		.55	.70		181
CV (S/mean)	1	9		.64	.95		12.1

2004 Recrop Safflower, Williston, ND

Variety	Bloom Date Aug	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538							
95B 7446	4	61.8		39.9	31.4		1406
Finch	5	64.8		42.5	32.8		1385
Montola 2000	5	56.0		37.1	33.3		1088
Montola 2003	3	56.0		41.0	33.1		1498
LSD (0.05)	2.2	2.4		1.8	2.0		211
CV (S/mean)	1.6	7.2		2.2	2.9		11.5

2004– 2006 Average Recrop, Safflower, Williston, ND

Variety	Bloom Date	Height cm	Stand Percent	Test Wt Lbs/A	Oil Content Percent	Oil Yield Lbs/A	Yield Lbs/A
95B 3538							
95B 7446	12.0	55.9		41.9	36.5		1232
Finch	12.3	58.6		44.3	37.8		1255
Montola 2000	12.7	49.0		39.7	36.4		1047
Montola 2003	11.7	51.9		41.8	35.1		1198

95B 7446 (2006) Breeder's Seed
Fatty Acid Composition

Fatty Acid ID	C16:0	C18:0	C18:1	C18:2	C20:0	C22:0	C24:0	%
	Saturated	Saturated	Mono	Poly	Saturated	Saturated	Saturated	SAT.
95B 3538	5.7	4.2	9.1	79.0	0.1	0.2	0.2	10.4
95B 7446	4.4	1.4	81.1	10.4		0.3	0.3	6.4