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Soil and Crop Sciences

Western Colorado
Research Center

Extension



MAKING BETTER DECISIONS

2009 Colorado Sunflower
Variety Performance Trials

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2009 Colorado Sunflower Hybrid Performance Trials

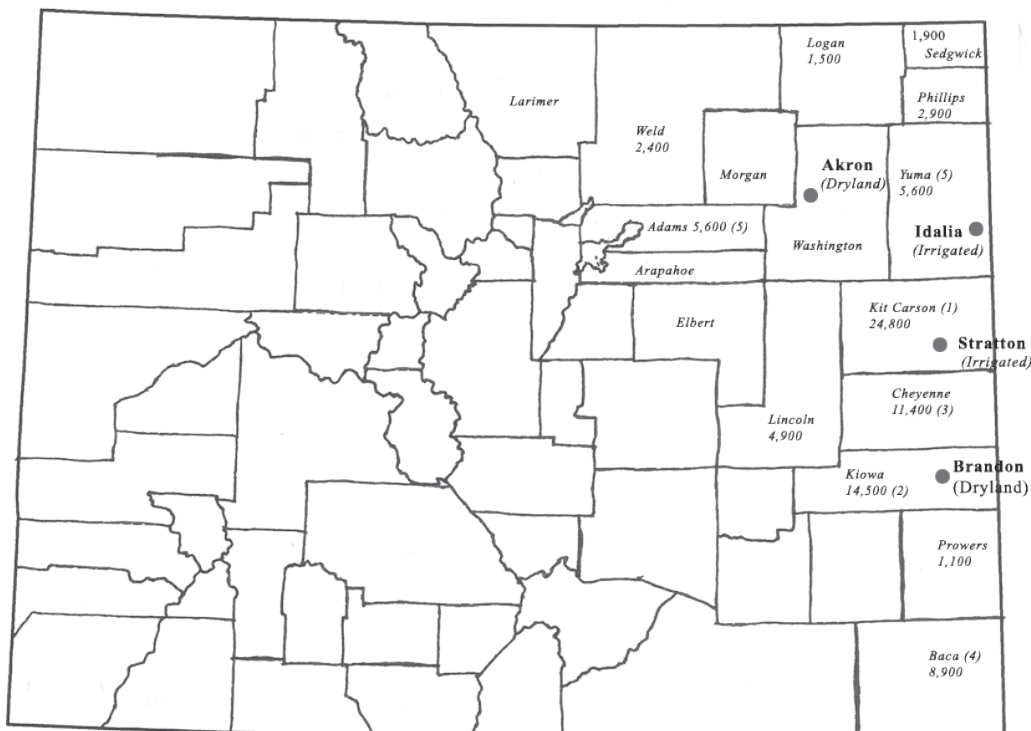
Introduction

CSU's Crops Testing personnel assists Colorado sunflower producers to make the best possible hybrid sunflower seed selection by providing unbiased and reliable yield trial results from oil and confection sunflower performance trials. Variable climatic conditions, innovations from biotechnology, acquisitions and mergers of seed companies, and rapid development of new hybrid lines means that unbiased crop performance information is increasingly important to Colorado sunflower producers.

Each year, Colorado sunflower producers purchase over \$4 million of seed which means that good variety performance information is essential to making better sunflower variety decisions.

Colorado State University personnel evaluated commercial oil and confection sunflower hybrids under irrigation at two locations and in two dryland locations. The dryland oil and confection trials at Brandon, Kiowa County, were lost this year due to heavy damage from deer. The results from the other trials are presented in the following tables with the exception of the irrigated confection trial at Idalia which was lost to damage from different animals and hail. These tables are intended to be stand-alone and self explanatory. Personnel and operational costs for conducting these trials come from Colorado State University, the Colorado Sunflower Administrative Committee, and sunflower seed company entry fees.

Four Colorado sunflower trial locations in 2009 and the 2006 acreage harvested.



2009 Irrigated Oil Sunflower Variety Performance Trial at Idalia¹

Company	Hybrid	Grain			Plant		
		Yield lb/ac	Moisture %	Test Weight lb/bu	Plant Height in	Population plants/ac	Oil Content %
Monsanto	DKF38-75 NS	2716	9.7	27.7	50	11850	40.4
Monsanto	DKF38-45 HO	2559	8.0	28.2	47	13048	42.84
Triumph Seed	657	2549	11.9	22.8	60	13652	40.05
Triumph Seed	TRX 8341	2485	12.6	25.1	57	13835	41.17
Mycogen Seeds	8N510	2408	9.4	26.8	49	14099	37.43
Seeds 2000	Firebird Express	2348	11.4	22.7	57	13846	36.9
Monsanto	DKF34-33 NS/DM	2331	8.1	29.7	51	11989	42.89
Croplan Genetics	369 DMR NS	2234	11.3	25.6	58	14895	41.53
Monsanto	DKF37-31 NS	2178	9.7	26.6	41	12224	40.21
Mycogen Seeds	8N187	2168	9.7	25.2	44	14688	39.63
Mycogen Seeds	8N453DM	2168	9.7	28.8	53	12402	41.49
Monsanto	DKF39-80CL	2134	9.2	25.9	57	13902	37.38
Advanta	AP461NS	2131	10.7	28.0	51	13035	39.78
Monsanto	DKF37-32 NS	2129	9.8	25.6	43	11740	38.93
Triumph Seed	664	2126	10.6	24.8	56	11428	40.04
Croplan Genetics	356A NS	2118	10.7	26.9	43	13692	40.27
Triumph Seed	s655	2109	8.7	25.1	33	13995	40.62
Triumph Seed	s878HO	2095	11.8	27.0	48	11205	41.18
Advanta	AP462NS	2093	10.1	26.5	56	13786	40.39
Monsanto	MH9002CL	2083	10.2	29.9	54	13745	38.6
Mycogen Seeds	8N433DM	2072	10.2	25.3	47	14504	41.06
Croplan Genetics	460 E NS	2030	11.0	24.3	56	12832	40.11
Seeds 2000	Blazer CL	2027	10.3	24.4	56	14661	39.05
Triumph Seed	630CL	2021	10.0	24.0	52	10214	37.62
Advanta	F30294NS,Rust	2013	9.9	24.4	60	14567	37.37
Triumph Seed	845HO	1971	13.1	22.4	53	12358	39.69
Croplan Genetics	555 CL DMR NS	1968	9.6	23.7	62	12455	37.63

Triumph Seed	s668	1960	11.1	25.9	44	14380	40.17
Mycogen Seeds	8H449DM	1950	11.0	27.7	57	11961	38.97
Triumph Seed	s678	1934	11.7	26.6	44	13630	41.05
Advanta	F30008NS,CL	1925	11.8	24.6	57	13849	36.9
Monsanto	IS7120 HO/DM	1919	9.3	25.5	43	13380	40.28
Triumph Seed	s674	1888	9.3	27.5	33	14707	42.96
Monsanto	DKF34-80CL	1841	9.0	25.8	48	13725	39.61
Triumph Seed	s680CL	1827	9.1	28.1	37	13433	39.2
Monsanto	MH9001CL	1796	10.5	25.7	52	13089	37.29
Croplan Genetics	378 DMR NS	1749	12.7	24.3	56	12671	36.54
Mycogen Seeds	8N358CLDM	1675	10.0	26.6	48	13371	41.44
Average		2098	10.3	25.9	50	13233	39.7
LSD _(0.30)		209					
LSD _(0.05)		400					

LSD0.30 is most useful for producers using these results to select a variety but some collaborators find LSD0.05 useful.

Experimental Design: randomized complete block design with four replications

Plot size: 5' x 31'

Site Information

Collaborator: Triple T Farms
 Soil type: Colby silt loam
 Previous crop: Pasture
 Planting Date: 6/26/2009
 Seeding: Over planted and thinned to a target of 15,000 plants/ac
 Fertilization: N-P-K (60-14-0)
 Herbicide: Sonalan, Dual II, Roundup
 Harvest Date: 11/6/2009 and 11/10/2009

Note: Field received hail in late July but plants recovered well.

Vials corrected to 10% moisture

2009 Dryland Oil Sunflower Performance Trial at Akron¹

Hybrid	Yield lb/ac	Moisture %	Test Weight lb/bu	Plant Height inches	Population plants/ac
Croplan Genetics 356A NS	2154	12.6	27.0	53.00	15363
Monsanto DKF38-75 NS	2079	11.1	26.9	60.50	13852
Triumph Seed 657	2020	14.5	24.2	67.50	12270
Mycogen Seeds 8N510	1973	14.4	25.3	54.50	15668
Triumph Seed S671	1948	14.1	26.6	42.75	15316
Monsanto DKF37-32 NS	1930	12.1	26.6	53.75	14895
Mycogen Seeds 8N187	1887	13.1	24.6	50.75	14540
Monsanto DKF34-33 NS/DM	1846	10.8	25.1	56.25	14262
Monsanto DKF37-31 NS	1748	10.0	24.9	57.25	14283
Monsanto DKF39-80CL	1683	13.5	25.1	66.75	13623
Mycogen Seeds 8N358CLDM	1674	11.0	25.8	59.75	13911
Mycogen Seeds 8N433DM	1659	12.7	25.0	56.75	14403
Monsanto DKF34-80CL	1649	12.2	25.7	55.00	15105
Croplan Genetics 460 E NS	1643	12.8	24.0	58.50	14305
Mycogen Seeds 8H449DM	1637	14.2	27.2	56.50	13754
Monsanto IS7120 HO/DM	1632	12.4	25.1	54.75	14507
Mycogen Seeds 8N453DM	1621	12.8	26.8	58.75	15744
Monsanto DKF38-45 HO	1580	9.6	25.1	57.00	13387
Triumph Seed s655	1562	13.3	26.1	37.75	16300
Triumph Seed s678	1550	16.1	26.7	51.50	15501
Monsanto MH9001CL	1501	17.3	26.5	60.50	12719
Monsanto MH9002CL	1464	10.5	27.1	63.00	16099
Croplan Genetics 555 CL DMR NS	1438	12.7	24.0	62.75	13333
Croplan Genetics 369 DMR NS	1418	13.6	24.3	59.25	14023
Croplan Genetics 378 DMR NS	1339	12.0	23.7	60.75	15158
Average	1705	12.8	25.6	56.62	14493
LSD _{0.30}	255				
LSD _{0.05}	487				

LSD_{0.30} is most useful for producers using these results to select a variety but some collaborators find LSD_{0.05} useful.

Experimental Design: randomized complete block design with four replications

Plot size: 5' x 31'

Collaborator: USDA Central Great Plains Research Station at Akron (Dr. Merle Vigil, Director).
 Soil type: Weld silt loam/Keith Kuma Complex
 Previous crop: spring barley
 Planting Date: 6/19/2009
 Seeding Rate: 14,000 seeds/ac
 Fertilization: N 40 lb/ac
 Herbicide: Spartan, Roundup
 Harvest Date: 10/27/2009
 Yields corrected to 10% moisture

2009 Dryland Confection Sunflower Performance Trial at Akron¹

Company	Hybrid	Yield lb/ac	Grain Moisture %	Test Weight lb/bu	Plant Height inches	Plant Population plants/ac	Seed Size				
							Above 24/64 %	23/64 to 22/64 %	21/64 to 20/64 %	19/64 to 16/64 %	Through 16/64 to below %
Triumph	777C	1154	12.6	17.8	65	12534	4.0	9.0	16.4	59.2	11.4
Croplan Genetics	179	1038	11.9	17.3	67	12827	5.8	16.8	28.0	47.2	2.2
Mycogen Seeds	8C451	949	11.0	17.3	69	11803	2.0	12.2	19.6	53.4	12.8
Average		1047	11.8	17.5	67	12388	4	13	21	53	9

There were no statistical differences among hybrids for yield.

Experimental Design: randomized complete block with 4 replications

Plot size: 5' x 31'

Site Information

Collaborator: USDA Central Great Plains Research Station at Akron (Dr. Merle Vigil, Director).

Soil type: Weld silt loam/Keith Kuma Complex

Previous crop: spring barley

Planting Date: 6/19/2009

Seeding Rate: 14,000 seeds/ac

Fertilization: N 40 lb/ac

Herbicide: Spartan, Roundup

Harvest Date: 10/27/2009

Yields corrected to 10% moisture

2009 Irrigated Oil Sunflower Performance Trial at Stratton

Company	Hybrid	Yield lb/ac	Grain		Test Weight lb/bu	Plant Height in	Plant plants/ac
			Moisture %	Yield			
Monsanto	DKF38-45 HO	3448	6.4	30.4	64	16206	
Monsanto	DKF38-75 NS	3374	6.7	31.9	67	16487	
Triumph Seed	664	3234	8.6	31.6	77	19298	
Mycogen Seeds	8H449DM	3076	8.0	32.3	71	17237	
Mycogen Seeds	8N453DM	2909	6.8	32.1	73	19391	
Monsanto	DKF34-33 NS/DM	2795	6.6	33.8	64	19017	
Seeds 2000	Firebird Express	2748	7.9	29.8	68	16019	
Croplan Genetics	369 DMR NS	2693	8.1	29.9	71	18080	
Monsanto	DKF37-31 NS	2692	6.8	30.2	60	18361	
Croplan Genetics	356A NS	2681	7.6	31.5	65	17892	
Croplan Genetics	555 CL DMR NS	2677	6.9	30.0	73	18267	
Monsanto	DKF37-32 NS	2670	7.1	31.0	66	18923	
Seeds 2000	Blazer CL	2655	7.9	32.8	72	16581	
Mycogen Seeds	8N433DM	2633	6.7	29.2	64	17705	
Monsanto	DKF39-80CL	2630	7.1	29.9	72	14988	
Seeds 2000	Sierra	2593	7.5	28.2	66	15176	
Monsanto	MH9002CL	2577	6.7	33.0	68	15550	
Monsanto	IS7120 HO/DM	2414	7.4	31.0	65	19298	
Seeds 2000	Barracuda CL	2393	9.5	31.4	73	16113	
Triumph Seed	657	2301	8.4	29.1	75	15363	
Croplan Genetics	378 DMR NS	2222	8.2	30.1	76	19391	
Triumph Seed	s680CL	2197	7.6	32.4	45	17424	
Monsanto	MH9001CL	2188	7.8	32.6	74	17237	
Triumph Seed	s668	2177	10.0	31.5	56	18735	
Croplan Genetics	460 E NS	2173	7.4	30.2	73	18361	
Mycogen Seeds	8N510	2170	6.9	30.5	70	19860	

Mycogen Seeds	8N187	2025	8.0	30.0	66	13958
Triumph Seed	s678	1951	8.7	32.6	58	18080
Triumph Seed	s674	1862	8.3	32.0	46	17237
Triumph Seed	S671	1656	7.1	31.6	49	17799
Average		2516	7.6	31.1	66	17503
LSD _(0.30)		322				
LSD _(0.05)		616				

LSD0.30 is most useful for producers using these results to select a variety but some collaborators find LSD0.05 useful.

Experimental Design: Randomized complete block design with 3 replicates

Plot size: 5' x 31'

Site Information

Collaborator: Shulte Bros.
 Soil type: Norka silt loam
 Previous crop: Corn
 Planting Date: 6/10/2009
 Seeding: Overplanted and thinned to target of 18,000 plants/ac
 Fertilization: N-P-K (50-30-0)
 Insecticide: Headline
 Herbicide: Round Up, Spartan, Advance, Select

2009 Irrigated Confection Sunflower Performance Trial at Stratton

Seed Size

Company	Hybrid	Yield lb/ac	Grain Moisture %	Test Weight lb/bu	Plant Height in	Plant Population plants/ac	Seed Size					Through 16/64 to below
							Above 24/64 %	23/64 to 22/64 %	21/64 to 20/64 %	19/64 to 16/64 %	17	
CHS Sunflower	RH 3126RT	2710	10.9	20.4	77	17283	7.6	18.6	25.8	46.4	1.6	
Seeds 2000	Panther II	2689	9.1	20.7	70	14333	25.4	28.8	25.6	19.6	0.6	
Triumph Seed	777C	2336	9.2	20.8	81	14052	21.0	40.4	23.0	14.4	1.2	
Red River Commodities	2216	2305	8.5	19.9	72	13115	23.4	32.4	29.2	14.8	0.2	
CHS Sunflower	RH 1121	2293	8.4	19.8	76	15269	39.2	34.2	17.6	9.0	0.0	
Seeds 2000	Jaguar	2253	8.4	19.0	67	14520	25.8	33.6	25.4	14.6	0.6	
Seeds 2000	X9681	2228	8.5	18.3	72	13864	42.6	27.0	19.2	11.2	0.0	
Red River Commodities	2215	2226	8.3	20.3	70	13396	14.2	33.8	33.6	18.4	0.0	
Mycogen Seeds	8C451	2135	8.2	18.3	73	14895	34.8	33.8	18.0	12.6	0.8	
Red River Commodities	2217	2032	8.4	18.5	71	14707	27.4	36.0	23.6	12.2	0.8	
Red River Commodities	7015	1971	8.9	19.8	74	16206	38.0	29.6	17.4	14.6	0.4	
CHS Sunflower	RH 400CL	1812	8.4	18.7	63	15738	18.8	25.6	34.2	20.4	1.0	
Average		2249	8.8	19.5	72	14782	27	31	24	17		
LSD _(0.30)		251										
LSD _(0.05)		490										

LSD0.30 is most useful for producers using these results to select a variety but some collaborators find LSD0.05 useful.

Experimental Design: Randomized Complete Block Design

Plot size: 5' x 31'

Site Information

Collaborator: Shulte Bros.

Soil type: Norka Silt Loam

Previous crop: Corn

Planting Date: 6/10/2009

Seeding: Overseeded and hand-thinned to 15,000 plants/ac

Fertilization: N-P-K (50-30-0)

Insecticide: Headline

Herbicide: Round Up, Spartan, Advance, Select

Harvest Date: 11/4/2009

Yields corrected to 10% moisture

2009 Dryland Sunflower Variety Performance Trial at Yellow Jacket

Company	Hybrid ¹	Oil type ²	Seed Yield lb/ac	Oil Content %	Plant Population plants/ac	Seed Moisture %	Test Weight lb/bu	Plant Height in	50% Flower date	Lodging %	Deer & Elk Damage %	Bird Damage %
Pioneer	63M91	NuSun	1387	46.0	13184	5.4	31.1	50.7	9-Aug	0.0	1.7	2.3
Mycogen	8N453DM	NuSun	1348	46.6	13765	5.7	33.4	41.0	10-Aug	0.0	0.0	1.7
Mycogen	8H449DM	High Oleic	1259	47.3	12952	5.8	32.9	47.0	10-Aug	1.7	1.7	5.3
Triumph	657	NuSun	1246	46.6	10861	5.6	29.1	49.4	12-Aug	3.3	0.0	11.3
Pioneer	MH6640	NuSun	1226	44.4	13126	5.5	30.9	43.9	10-Aug	3.3	2.3	1.0
Mycogen	8N510	NuSun	1191	42.5	14172	5.7	30.2	40.0	11-Aug	0.0	0.0	1.7
Triumph	s878HO	High Oleic	1171	43.9	10745	5.9	31.7	36.9	14-Aug	0.0	4.3	4.3
Triumph	664	NuSun	1160	44.4	10571	5.7	29.9	48.0	12-Aug	0.7	0.7	3.3
Dekalb	37-31	NuSun	1154	44.1	11500	5.5	31.8	46.2	10-Aug	2.3	7.0	2.7
Triumph	820HO	High Oleic	1104	45.4	13707	5.3	31.5	45.9	5-Aug	2.3	1.7	10.7
Mycogen	8N187	NuSun	1099	42.4	11848	5.5	29.9	38.9	9-Aug	0.0	4.3	9.3
Mycogen	8N433DM	NuSun	1098	45.8	12894	5.5	29.8	43.7	8-Aug	0.7	0.0	2.0
Pioneer	64H41	High Oleic	1032	42.9	12197	5.6	30.4	50.3	10-Aug	0.0	0.0	6.0
Triumph	s671	NuSun	1027	45.1	12661	5.4	32.4	30.8	13-Aug	1.7	4.7	8.0
Mycogen	8H419CL	High Oleic	1002	42.6	11790	5.7	29.3	41.4	10-Aug	3.3	2.7	2.0
Triumph	845HO	High Oleic	996	44.7	11326	5.7	28.8	42.2	10-Aug	1.7	0.3	0.7
Mycogen	8H288CLDM	High Oleic	952	44.8	10512	5.4	31.0	43.4	6-Aug	5.0	2.0	7.7
Triumph	s655	NuSun	637	44.2	11442	5.5	31.4	32.3	13-Aug	0.0	19.3	16.3
Average			1116	44.6	12181	5.6	30.9	42.9		1.4	2.9	5.4
LSD _{.05}			211									

¹ CL = Clearfield; DM = Downy mildew resistant

² NS = NuSun (mid-oleic); HO = High-oleic

Experimental Design: randomized complete block design with 3 replications

Plot size: 10' x 170'

Site Information

Trial conducted at the Southwestern Colorado Research Center in Yellow Jacket, CO

Soil type: Weatherhill silty clay loam

Previous crop: Summer fallow

Planting Date: 6/2/2009

Seeding rate: Target 15,563 seeds/ac

Rain (Jun-Oct): 3.29 in (gross amount) or 43% of normal

Fertilization: N-P-K (50-20-0) on 5/1/2009

Herbicide: Sonalan @ 2.0 pt/ac on 5/6/2009

Deer repellent: PlantSkydd on 7/17, 8/04, and 8/18/09

Harvest Date: 11/4 & 11/5/2009

Seed yields corrected to 10% moisture

Comments: Summer precipitation was well below average but good soil moisture at planting helped achieve decent seed yields.

Triumph hybrid s655 incurred substantial deer, elk, and bird damage.

2009 Dryland Safflower Variety Performance Trial at Yellow Jacket

Entry	Company	Primary oil type	Seed yield ² (lb/ac)	Oil content (%) ³	Test weight (lb/bu)	Seed moisture (%)	Plant height (in.)	50% bloom Julian day
ST101	STI ⁴		1218	37.3	41.4	5.8	25.0	207.8
CW880L	Cal/West Seeds	Oleic	1208	41.0	39.3	5.5	22.5	210.5
3151*	SeedTec	Oleic	1137	40.0	41.0	5.7	22.4	208.5
MT3538	STI		1109	36.9	41.7	5.9	23.8	210.5
7313*	SeedTec	Oleic	1063	37.8	43.4	6.6	25.1	212.8
CW990L	Cal/West Seeds	Oleic	1050	41.3	39.3	5.6	24.6	209.0
ST190	STI		997	34.0	43.1	6.1	23.0	208.0
CW1221	Cal/West Seeds	Linoleic	994	41.9	39.7	5.7	23.4	208.5
MT7446	STI		979	37.3	41.5	5.7	23.3	209.0
S-345	SeedTec	Oleic	940	41.5	39.9	5.6	25.3	209.5
ST150	STI		923	44.6	35.8	4.9	23.6	208.5
3125*	SeedTec	Oleic	900	41.8	41.8	6.2	23.4	210.5
2106*	SeedTec	Oleic	861	42.8	40.6	5.3	21.9	206.5
Average			1029	39.9	40.6	5.7	23.6	209.2
CV (%)			11	1.0	2.7	4.6	5.9	0.6
LSD_{.05}			161	0.6	1.5	0.4	2.0	1.8

¹Trial conducted at Colorado State University's Southwestern Colorado Research Center

² Adjusted to 10% moisture

³ Oil content at 0% moisture/Oil analysis courtesy of Art Weisker of SeedTec

⁴ Safflower Technologies International, LLC

* Not available for sale

Planted: May 7, 2009

Harvested: September 25, 2009

Seeding rate: 25 lb/ac in 12" row spacing

Previous crop: Summer-fallowed in 2007 and 2008

Fertilizer: 50 lbs N/ac + 20 lb P₂O₅/ac on 5/1/09

Herbicide: Sonalan @ 2 pt/ac PPI on 5/6/09

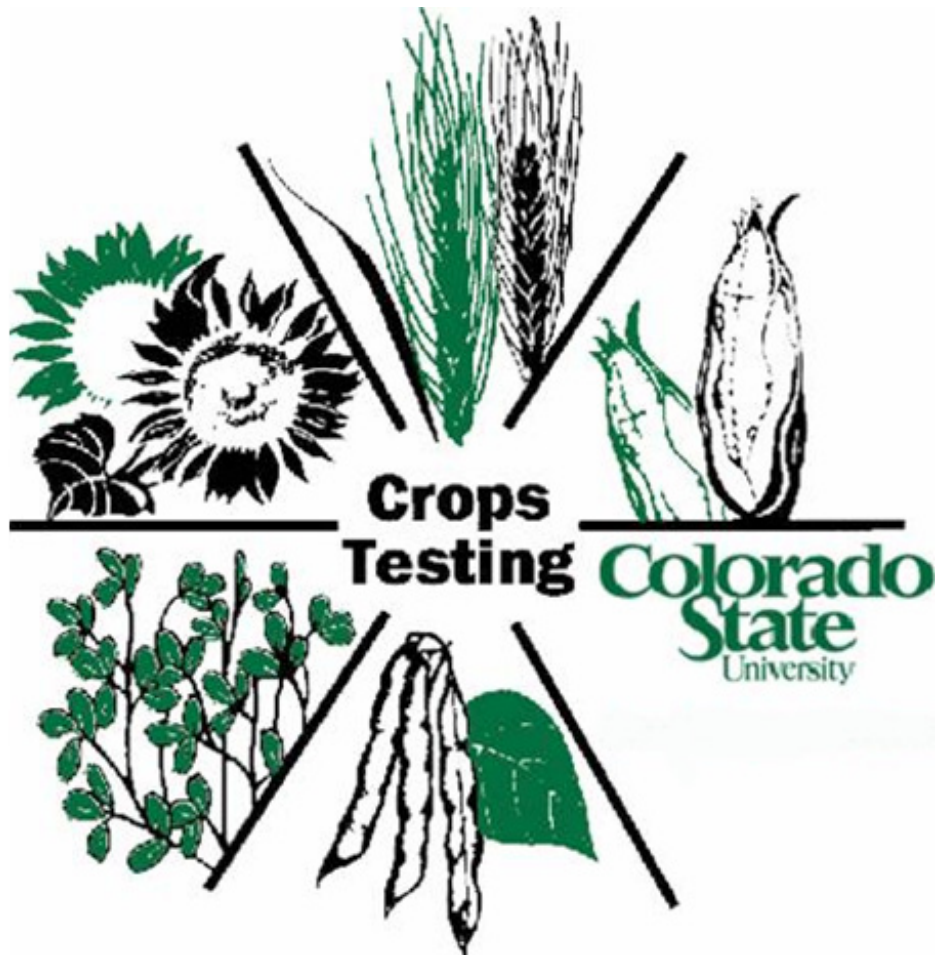
Precipitation (rain + snow):

Jan.-Apr.: 1.8 in. (40% of normal)

May-Sept.: 4.4 in. (67% of normal)

Planting to harvest: 4.1 in. (65% of normal)

Comments: Soil moisture at planting was excellent, partly because the ground was summer-fallowed for two consecutive years. Pre-season precipitation was below average as was July and August rainfall. Seed yields were comparable to last year's. None of the entries lodged. Seed shattering was negligible. Grasshoppers were plentiful in the area but did not seem to cause much damage to safflowers.



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