

Technical Report

TR12-14 December 2012

Colorado
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Agricultural Experiment Station

College of Agricultural Sciences

Department of Soil & Crop Sciences

Extension



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**2012 Colorado Sunflower
Hybrid Performance Trials**

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2012 Colorado Sunflower Hybrid Performance Trials

Colorado State University conducts hybrid oil and confection sunflower performance trials to provide unbiased and reliable information to Colorado sunflower producers so they can select the best hybrids for their production system. Variable climatic conditions, innovations from plant breeding and biotechnology, acquisitions and mergers of seed companies, and rapid development of new hybrid lines means crop performance information is increasingly important to Colorado sunflower producers. The sunflower hybrid performance trial is made possible by funding received from company entry fees, the Colorado Sunflower Administrative Committee, and the CSU Agricultural Experiment Station.

Colorado produced approximately 124 million pounds of sunflowers on 113,000 harvested acres in 2011. The total value of production was over 40 million dollars. Colorado State University personnel evaluated commercial and experimental oil and confection sunflower hybrids in eastern Colorado at three irrigated and two dryland locations in 2012. Irrigated locations included Burlington, Idalia, and Rocky Ford. The two dryland trials were located at Akron and Brandon. Unfortunately, Akron was lost due to severe drought and Brandon was lost due to severe damage by deer, which made the data too variable and unreliable to be used. Fifty-one hybrids with diverse origins and maturities were tested across different irrigated and dryland trial locations. Results tables for the trials are presented in the following pages. Plot sizes were approximately 150 ft². All irrigated trials were planted at 20,000 seeds per acre and both dryland trials were planted at 15,000 seeds per acre. Seed yields for all entries are reported in the tables. Yields and oil content (for oil trials) are adjusted to 10% seed moisture content.

Colorado Sunflower Trial Locations in 2012



2012 Irrigated Oil Sunflower Hybrid Performance Trial at Burlington

Source	Hybrid	Yield ^a	Moisture	Test Weight	Plant Height	Population	Oil Content
		lb/ac	percent	lb/bu	in	plants/ac	percent
Triumph Seed	s673	3313	7.7	30.3	50	21,139	44.6
Seeds 2000	Torino-CL	3246	6.9	33.1	64	21,296	44.4
Mycogen	8N678S	3119	9.4	31.8	54	21,877	44.7
Mycogen	8N510	3069	5.5	29.6	63	20,715	42.1
Triumph Seed	TRXs11431HO	3032	8.4	30.8	45	22,264	44.6
Triumph Seed	TRX1284CPDM	2987	6.0	32.7	61	21,705	45.8
Mycogen	8N421CLDM	2978	6.1	31.5	66	21,490	44.9
Syngenta Seed	NX24123	2967	8.0	28.1	65	21,006	42.2
Seeds 2000	Falcon-SU	2965	6.8	32.8	51	19,660	43.5
Syngenta Seed	3158 Pelleted	2874	5.6	31.0	60	18,779	43.6
Triumph Seed	TRX1262CLDM	2861	6.3	30.9	65	21,253	44.2
Syngenta Seed	3845 HO	2787	5.8	31.8	61	19,554	45.7
CROPLAN	432 E	2779	6.4	30.5	62	21,490	39.8
Mycogen	8H449CLDM	2763	6.2	33.5	58	19,844	46.0
Syngenta Seed	NX24122	2732	7.2	29.5	67	20,522	40.7
Syngenta Seed	3733 NS/DM Pelleted	2727	5.2	31.5	59	19,270	45.9
Triumph Seed	s668	2697	8.8	30.5	50	22,748	44.5
Seeds 2000	Daytona-CL	2689	7.7	31.0	56	22,554	42.4
CROPLAN	559 CL	2653	5.5	31.4	62	20,231	44.9
CROPLAN	460 E	2622	6.6	30.3	62	20,812	46.5
Seeds 2000	Durango-SU	2579	6.3	31.5	52	19,457	43.6
Triumph Seed	TRX1261	2527	5.6	30.1	60	20,715	43.5
Seeds 2000	X6814-CL/DMR	2478	6.7	31.1	64	22,070	42.0
Triumph Seed	TRX11345CPD	2338	6.5	29.6	66	20,458	46.1
Syngenta Seed	3995 NS/SU	2316	5.9	31.1	58	20,328	41.5
Syngenta Seed	3158 NS/CL/DM	2313	6.1	31.1	55	20,231	42.8
Syngenta Seed	3495 NS/CL/DM	2312	5.3	32.5	59	20,715	44.0
Syngenta Seed	3990 NS/CL/DM	2235	6.0	32.9	60	21,490	43.4
Syngenta Seed	3733 ND/DM	2227	5.0	32.0	58	19,360	44.7
Seeds 2000	X6872-CL/DMR	2198	7.1	29.6	61	22,718	40.3
Seeds 2000	X6878-CL/DMR	2181	5.7	32.6	66	23,716	44.9
CROPLAN	548 CL	2141	5.5	31.4	60	19,277	41.8
Seeds 2000	X6822-CL/DMR	2121	6.6	30.9	61	21,780	41.4
Syngenta Seed	NX24121	2119	5.7	31.6	61	21,296	38.6
Average		2645	6.5	31.2	59	20,936	43.5

^bLSD (P<0.30)

272

^aYields were corrected to 10% moisture.

^bIf the difference between two hybrid yields equals or exceeds the LSD value, there is a 70% chance the difference is statistically significant.

Plot size: 5' x 30'

Site Information

Collaborator: Gerhardt Heintges
 Planting Date: 6/7/2012
 Harvest Date: 10/17/2012
 Fertilizer: N-P at 110-30 lb/ac
 Herbicide: Spartan applied at 3 oz/ac

2012 Irrigated Confection Sunflower Hybrid Performance Trial at Burlington

Source	Hybrid	Yield ^a lb/ac	Moisture percent	Test Weight lb/bu	Plant Height in	Population plants/ac	Seed Size							
							Over 24/64	Over 23/64	Over 22/64	Over 21/64	Over 20/64	Over 19/64	Over 16/64	Through 16/64
							percent							
Red River Commodities	2215 CL	3278	10.4	21.2	70	15,261	5.8	10.4	14.6	20.6	22.0	17.8	8.2	0.6
Seeds 2000	X4334-CL	3251	15.1	19.9	65	16,166	6.6	10.2	16.4	19.2	13.8	16.8	16.4	0.6
Red River Commodities	8015	3209	10.7	17.7	63	16,746	7.6	9.8	15.4	22.4	16.2	16.4	11.0	1.2
Seeds 2000	Jaguar II-CL	3119	11.0	19.8	69	15,294	8.2	9.8	13.2	17.6	21.2	17.8	10.0	2.2
Mycogen	8C451CP	3095	9.9	19.9	65	15,144	9.0	10.0	11.8	25.4	14.6	18.4	9.8	1.0
Seeds 2000	5009	3034	11.8	20.3	64	15,874	3.0	5.0	7.4	19.2	15.4	22.6	25.2	2.2
Red River Commodities	2217	2865	8.7	19.1	70	16,750	13.6	12.4	20.2	19.8	18.4	9.2	5.6	0.8
Red River Commodities	2215	2833	9.5	19.9	69	15,175	4.6	11.4	15.8	21.4	22.0	15.6	8.4	0.8
Seeds 2000	X4337-CL	2738	15.5	19.4	70	12,580	5.2	4.2	5.2	9.2	12.6	19.0	37.2	7.4
Seeds 2000	Jaguar-CL	2715	10.8	20.1	60	14,845	6.4	12.4	18.8	21.0	14.0	12.0	12.8	2.6
Average		3014	11.3	19.7	67	15,383	7.0	9.6	13.9	19.6	17.0	16.6	14.5	1.9

^bLSD (P<0.30) 357

^aYields were corrected to 10% moisture.

^bIf the difference between two hybrid yields equals or exceeds the LSD value, there is a 70% chance the difference is statistically significant.

Plot size: 5' x 30'

Site Information

Collaborator: Gerhardt Heintges
 Planting Date: 6/7/2012
 Harvest Date: 10/17/2012
 Fertilizer: N-P at 110-30 lb/ac
 Herbicide: Spartan applied at 3 oz/ac

2012 Irrigated Oil Sunflower Hybrid Performance Trial at Idalia

Source	Hybrid	Yield ^a lb/ac	Moisture percent	Test	Plant	Population plants/ac	Lodging percent	Oil
				Weight lb/bu	Height in			Content percent
Mycogen	8N421CLDM	2015	8.3	30.0	60	19,010	10.8	42.8
Syngenta Seed	3845 HO	1900	7.1	29.0	61	18,642	9.3	44.4
Triumph Seed	TRX1261	1879	9.3	29.7	57	20,422	8.8	42.3
Triumph Seed	TRX1284CPDM	1849	9.7	29.9	50	17,892	11.3	43.6
Seeds 2000	Falcon-SU	1808	9.2	28.9	62	18,061	11.3	40.1
Mycogen	8N510	1771	10.5	28.3	61	18,878	8.3	40.8
Triumph Seed	TRX1262CLDM	1720	8.7	29.2	59	20,328	13.3	42.0
Triumph Seed	TRXs11431HO	1706	10.8	28.9	50	16,668	19.8	42.2
Syngenta Seed	3733 ND/DM	1667	9.1	29.4	59	19,685	19.0	43.3
Triumph Seed	s668	1647	10.4	29.1	47	16,391	14.7	42.3
Mycogen	8H449CLDM	1625	9.2	30.2	52	18,907	9.8	43.3
Mycogen	8N678S	1486	12.5	28.8	49	19,040	6.6	40.9
Syngenta Seed	3158 NS/CL/DM	1440	9.1	27.8	53	19,017	14.8	40.4
Syngenta Seed	3733 NS/DM Pelleted	1391	10.1	28.6	52	18,361	20.9	42.6
Seeds 2000	Durango-SU	1387	12.7	28.0	53	16,932	16.6	38.3
Seeds 2000	Torino-CL	1380	9.0	29.9	56	19,672	20.3	44.0
CROPLAN	460 E	1378	10.6	28.3	56	17,692	20.6	43.6
Syngenta Seed	NX24123	1369	10.3	25.4	60	17,429	12.3	39.0
Syngenta Seed	NX24122	1357	10.4	27.3	60	17,883	25.6	38.1
Triumph Seed	s673	1350	8.5	28.9	45	17,421	15.4	42.1
Syngenta Seed	3158 Pelleted	1335	8.6	28.7	57	19,485	27.1	42.5
Triumph Seed	TRX11345CPD	1293	9.7	29.0	65	17,934	10.5	44.3
Syngenta Seed	3495 NS/CL/DM	1289	9.2	29.6	56	17,049	24.8	40.3
Syngenta Seed	3995 NS/SU	1274	10.4	29.2	59	20,245	20.4	41.6
Seeds 2000	Daytona-CL	1265	10.7	27.3	54	18,935	8.1	40.5
CROPLAN	432 E	1214	9.3	29.0	59	19,298	20.2	39.2
Syngenta Seed	3990 NS/CL/DM	1211	10.0	30.0	56	19,400	12.7	39.2
Syngenta Seed	NX24121	1200	10.2	29.3	52	19,496	8.2	37.9
Seeds 2000	X6872-CL/DMR	1192	9.7	28.4	58	20,609	12.7	41.8
Seeds 2000	X6814-CL/DMR	1184	9.9	28.3	56	17,424	17.0	40.2
CROPLAN	559 CL	1184	11.6	28.7	66	19,110	22.5	42.6
Seeds 2000	X6822-CL/DMR	1105	9.6	27.7	50	19,234	12.8	41.0
Seeds 2000	X6878-CL/DMR	1055	9.3	30.2	60	19,672	35.8	41.8
CROPLAN	548 CL	1054	10.4	28.2	60	17,577	19.0	39.5
Average		1441	9.8	28.8	56	18,641	15.9	41.4

^bLSD (P<0.30)

271

^aYields were corrected to 10% moisture.

^bIf the difference between two hybrid yields equals or exceeds the LSD value, there is a 70% chance the difference is statistically significant.

Plot size: 5' x 30'

Site Information

Collaborator: Brad Rock

Planting Date: 5/29/2012

Harvest Date: 10/3/2012

Fertilizer: Nitrogen at 50 lb/ac

Herbicides: Prowl and Roundup PowerMax

Trial Comments: Plots were severely infested with Amaranth, which adversely affected yield. Seed samples from each plot were cleaned for accurate measurement of seed moisture and test weight. Yields were adjusted based on percent clean seed in each plot sample.

2012 Irrigated Confection Sunflower Hybrid Performance Trial at Idalia

Source	Hybrid	Yield ^a lb/ac	Moisture percent	Test Weight lb/bu	Plant Height in	Population plants/ac	Lodging percent	Seed Size												
								Over		Over		Over		Over		Over		Over		Through
								24/64	23/64	22/64	21/64	20/64	19/64	18/64	17/64	16/64	15/64	14/64	16/64	
Dahlgren/Sunopta	D-9579	2377	12.5	18.2	61	15,082	9.8	8.6	11.0	15.0	25.4	13.2	17.2	8.8	0.8					
Red River Commodities	8015	2284	12.9	18.2	63	16,862	6.1	9.6	14.8	17.2	25.0	12.2	13.0	7.6	0.6					
Seeds 2000	5009	2271	14.9	20.7	66	15,550	7.9	1.6	4.0	7.2	13.0	23.6	26.4	22.6	1.6					
Red River Commodities	2217	2158	12.3	20.8	66	13,666	9.5	9.2	14.8	18.2	21.2	17.4	10.8	6.8	1.6					
Seeds 2000	Jaguar-CL	1986	12.6	20.4	58	13,821	13.1	10.4	15.8	18.0	21.4	11.6	13.8	8.0	1.0					
Seeds 2000	Jaguar II-CL	1971	14.7	21.3	62	14,096	10.2	10.4	11.4	20.6	20.0	17.0	10.8	8.0	1.8					
Red River Commodities	2215	1860	11.9	20.9	65	13,692	8.7	3.2	5.8	15.6	22.6	20.0	20.6	10.6	1.6					
Seeds 2000	X4337-CL	1736	17.6	19.9	63	12,342	7.4	2.0	3.4	3.8	7.8	18.8	28.0	32.4	3.8					
Red River Commodities	2215 CL	1701	12.9	21.0	67	14,730	6.6	8.6	10.2	16.4	19.4	19.0	15.0	10.2	1.2					
Triumph Seed	770CL	1666	15.3	18.3	71	15,641	6.7	14.2	12.6	21.2	23.4	11.2	10.2	5.6	1.6					
Seeds 2000	X4334-CL	1664	13.9	20.2	67	16,383	14.9	1.6	5.6	12.2	17.8	23.6	25.4	12.8	1.0					
Dahlgren/Sunopta	D-9530CL	1628	15.8	20.8	63	13,805	11.0	2.2	5.0	9.4	21.8	16.6	27.0	17.4	0.6					
Dahlgren/Sunopta	D-9592CL	1603	13.2	20.0	68	16,289	8.1	11.8	15.8	16.6	26.4	12.6	10.4	5.8	0.6					
Triumph Seed	751C	1582	14.1	19.6	69	10,941	9.7	12.8	13.2	14.0	18.0	17.6	15.0	7.8	1.6					
Mycogen	8C451CP	1545	15.1	19.2	67	13,184	6.7	10.2	11.8	16.8	18.2	18.6	14.6	8.8	1.0					
Dahlgren/Sunopta	D-9530	1448	12.0	21.1	66	14,769	7.9	3.2	7.0	14.0	28.8	16.4	17.2	12.2	1.2					
Triumph Seed	755C	1233	14.7	19.1	74	13,809	16.1	6.2	8.6	12.8	19.6	15.4	21.0	14.4	2.0					
Average		1807	13.9	20.0	66	14,392	9.4	7.4	10.0	14.6	20.6	16.8	17.4	11.8	1.4					

^bLSD (P<0.30) 308

^aYields were corrected to 10% moisture.

^bIf the difference between two hybrid yields equals or exceeds the LSD value, there is a 70% chance the difference is statistically significant.

Plot size: 5' x 30'

Site Information

Collaborator: Brad Rock
 Planting Date: 5/29/2012
 Harvest Date: 10/3/2012
 Fertilizer: Nitrogen at 50 lb/ac
 Herbicides: Prowl and Roundup PowerMax
 Trial Comments: Plots were severely infested with Amaranth, which adversely affected yield. Seed samples from each plot were cleaned for accurate measurement of seed moisture and test weight. Yields were adjusted based on percent clean seed in each plot sample.

2012 Irrigated Oil Sunflower Hybrid Performance Trial at Rocky Ford

Source	Hybrid	Yield ^a lb/ac	Moisture percent	Test	Plant	Population plants/ac	Oil	Head	Flowering Date ^b days after planting
				Weight lb/bu	Height ^b in		Content percent	Diameter in	
Seeds 2000	Daytona-CL	1492	16.1	26.3	67	17,424	42.0	8.4	65
Triumph Seed	s668	1330	11.2	28.1	62	15,682	38.8	8.8	67
Triumph Seed	s673	1227	15.3	23.4	61	16,553	43.3	8.0	68
Syngenta Seed	3733 ND/DM	1226	8.8	30.4	65	16,262	44.7	9.4	64
Syngenta Seed	3733 NS/DM Pelleted	1197	8.6	28.6	66	15,682	39.9	8.1	63
Triumph Seed	TRX11345CPD	1065	11.8	27.8	80	17,424	44.1	7.6	64
Seeds 2000	X6878-CL/DMR	1037	18.5	25.0	-	13,939	38.5	9.1	-
Triumph Seed	TRX1262CLDM	961	6.7	30.3	78	22,361	43.3	8.3	63
Syngenta Seed	NX24122	929	11.0	25.4	89	20,909	43.5	8.7	66
Triumph Seed	TRX1284CPDM	839	9.9	29.2	70	17,134	40.1	8.5	66
Syngenta Seed	NX24123	778	10.9	24.5	82	17,424	43.6	9.3	67
Seeds 2000	X6872-CL/DMR	730	7.1	25.1	77	18,005	40.9	8.0	64
Triumph Seed	TRXs11431HO	698	6.5	27.6	53	14,230	40.7	8.5	67
Triumph Seed	TRX1261	685	7.3	28.9	74	19,166	39.2	8.1	64
Syngenta Seed	3158 Pelleted	616	8.9	28.4	72	18,586	41.8	8.8	64
Seeds 2000	X6822-CL/DMR	584	7.8	26.0	66	18,295	43.1	7.9	63
Syngenta Seed	3158 NS/CL/DM	573	6.8	28.1	68	18,586	38.9	9.0	62
Syngenta Seed	3845 HO	573	7.6	28.6	71	15,101	39.5	8.4	62
Seeds 2000	Torino-CL	551	5.6	28.2	77	21,199	41.3	7.3	67
Syngenta Seed	3995 NS/SU	458	6.4	26.8	66	19,457	40.5	7.9	64
Seeds 2000	Falcon-SU	424	9.6	26.1	65	20,038	38.9	7.2	67
Syngenta Seed	3990 NS/CL/DM	400	10.9	24.4	74	22,361	36.0	7.5	67
Seeds 2000	Durango-SU	396	10.8	27.1	67	19,457	43.8	8.5	69
Syngenta Seed	3495 NS/CL/DM	382	8.5	23.5	69	16,262	40.2	7.8	64
Seeds 2000	X6814-CL/DMR	380	6.2	26.9	75	20,618	41.4	7.6	64
Syngenta Seed	NX24121	206	5.7	24.8	66	20,618	44.3	6.6	59
Average		759	9.4	26.9	70	18,184	41.2	8.2	65

^aYields were corrected to 10% moisture.

^bPlant height and flowering date data were only collected from plots that were not replanted.

Data Analysis: Yield trial data could not be interpreted due to the high degree of field variability caused by severe bird damage (overall field average for remaining seed was 31%) and replanting of one edge of the trial due to seedling damage from false cinchbugs early in the season. The yield results should not be used for selecting superior hybrids.

Plot size: 5' x 31'

Site Information

Collaborator: Arkansas Valley Research Center
 Planting Date: 5/24/2012 with part of trial replanted on 6/27/2012
 Harvest Date: 10/3/2012
 Previous Crop: Corn
 Fertilizer: N-P at 156-58 lb/ac applied as 18-46-0 and 82-0-0
 Irrigation: Furrow (24 inches applied over 6 irrigations)

Acknowledgments

The authors express their gratitude to the Colorado farmers and research stations who voluntarily and generously contributed the use of their land, equipment, and time to facilitate the 2012 sunflower hybrid performance trials. We are thankful to the collaborating farmers, Burl Scherler at Brandon, Gerhardt Heintges at Burlington, and Brad Rock at Idalia. We also thank Jeff Davidson and Michael Bartolo at the Arkansas Valley Research Center for conducting the Rocky Ford oil trial, and the staff at the Central Great Plains Research Station at Akron. We thank Triumph Seed Co. for conducting the sunflower seed oil content analyses, and Red River Commodities, Inc. for doing the confection sunflower seed-sizing analyses. The trials would not be possible without research support provided by the Colorado State University Agricultural Experiment Station.

Colorado State University

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A handwritten signature in black ink, appearing to read "Jerry Johnson". The signature is written in a cursive style.

Jerry Johnson, Extension Specialist Crop Production