

Technical Report TR 23-6



Agricultural Experiment Station

College of Agricultural Sciences

Department of Soil & Crop Sciences

Extension

Making Better Decisions



2023 Colorado Sunflower Variety Performance Trials



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Research conducted by Colorado State University Crops Testing Program
Department of Soil and Crop Sciences
Colorado State University Extension
Colorado Agricultural Experiment Station

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Summary of the 2023 Colorado Sunflower Hybrid Performance Trials

Sally Jones-Diamond

Colorado State University (CSU) conducts hybrid sunflower performance trials to provide research-based, unbiased, current, and reliable information to Colorado sunflower producers to make better planting decisions. Colorado State University promotes crop variety testing as a service to crop producers and seed companies who depend on us for crop variety performance information. The sunflower trials are made possible by funding received from company entry fees, the Colorado Sunflower Administrative Committee, and Colorado State University.

Colorado State University personnel planted one dryland oil sunflower trial in Colorado. The dryland trial was located at Julesburg. An irrigated oil site was planned at Arriba, but the trial was not planted due to high rainfall which prevented planting before the insurance deadline. Thirteen hybrids with diverse origins, maturities, and value-added traits were tested in our trial. Trial results are statistically analyzed and reported shortly after harvest on our website at www.csucrops.com/sunflower.

Testing Methods

Hybrids were included in the test based on paid company entries where company representatives select and enter hybrids and provide seed for planting. All trial entries were randomized within each replication using a randomized complete block design. Plot sizes were 4 rows wide for dryland trial at 30" spacing by 35' long. The dryland trial had four replicates. Cultural practices for the trial location is included below the individual site table when available and management practices in the trial area match the rest of the grower's field in most cases.

Plots planted using a four-row Seed Research Equipment Solutions (SRES) 2013 Classic Aire small plot vacuum planter equipped with Monosem seed meters. The dryland oil trial was planted at 19,000 seeds per acre. Grain yields for all trial hybrids are reported in the tables.

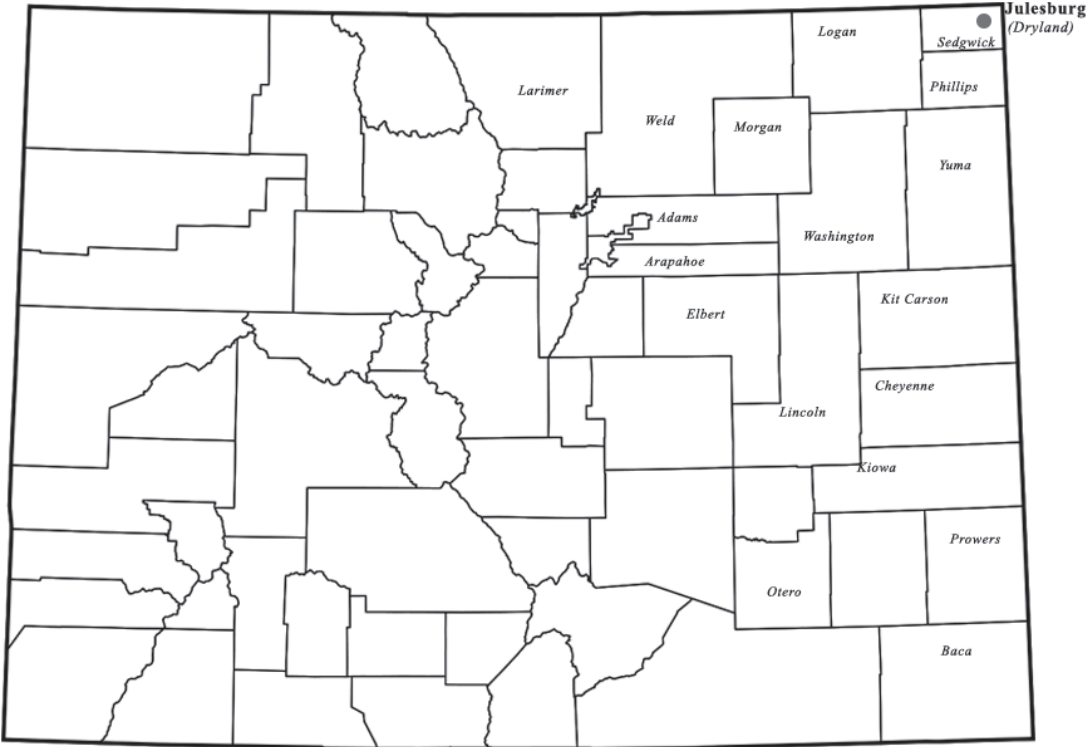
Sunflower plots were harvested using a Case IH 1620 combine modified for small plots and equipped with a H2 GrainGage weighing system (provides weight, moisture, and test weight). All yields are calculated and adjusted to 10% moisture content. Oil seed contents are also adjusted to 10% moisture.

Data Results

The least significant difference (LSD) is provided at the bottom of the results table. The LSD is used to help determine whether the difference in hybrid yields is statistically significant. If the difference between two hybrid yields equals or exceeds the LSD value, the difference is significant. Farmers should use the LSD ($P < 0.30$) for selecting superior hybrids to minimize economic loss due to false negative results and others may use LSD ($P < 0.05$) to minimize the risk of false positive results. If two entries being compared have a difference in yield that is less than the LSD value, those two entries are to be considered equal yielding. Hybrid yields in bold are in the top LSD group. Hybrids in the table are sorted from highest to lowest-yielding.

Hybrid selection may be based on more than yield performance. Other factors to consider when selecting a hybrid may include maturity, herbicide or pest tolerance traits, disease resistance, standability, seed size, and seed quality.

Colorado Sunflower Trial Locations in 2023





2023 Dryland Oil Sunflower Hybrid Performance Trial at Julesburg



Brand	Hybrid	Oil Type ^a	Technology Traits ^b	Grain		2-Year		Test		Plant		Oil
				Yield ^c lb/ac	% of test avg.	Avg. Yield lb/ac	Moisture percent	Weight lb/ac	Population plants/ac	Height in	Content percent	
DYNAGRO	H42HO18CL	HO	Clearfield	1236	118%	-	10	21	16,459	50	33	
CROPLAN	CP455E	HO	ExpressSun	1173	112%	1157	10	22	13,323	54	31	
DYNAGRO	H49HO19CL	HO	Clearfield	1135	109%	1183	10	22	15,245	57	32	
CROPLAN	CP7919CL	NS	Clearfield	1111	106%	1351	10	22	8,870	52	31	
DYNAGRO	H47HO11EX	HO	ExpressSun	1089	104%	-	10	23	7,931	60	33	
DYNAGRO	H45HO10EX	HO	ExpressSun	1008	97%	-	9	19	11,972	62	29	
Nuseed	N4H521 CL	HO	Clearfield, DMR	997	96%	1188	10	21	11,480	60	30	
DYNAGRO	H50HO20CP	HO	Clearfield Plus	997	96%	-	10	22	14,920	56	30	
Nuseed	N4H490 E	HO	ExpressSun, DMR	996	95%	-	10	23	14,060	61	32	
Nuseed	Hornet	HO	Clearfield, DMR	976	94%	1103	10	21	14,276	61	31	
Nuseed	N4H470 CLP	HO	Clearfield Plus, DMR	959	92%	1154	10	21	15,078	63	31	
Nuseed	N4H422 CL	HO	Clearfield, DMR	944	90%	1162	10	22	13,526	60	32	
DYNAGRO	H45NS16CL	NS	Clearfield	943	90%	-	10	23	14,596	53	30	
Average				1043	100%	1185	10	22	13,200	58	31	
				^d LSD (0.30)	104							
				^d LSD (0.05)	200							
				Coefficient of Variation (%)	12.6							

^aOil type designations: HO=High oleic; NS=NuSun/Mid-oleic.

^bTechnology trait designations: Clearfield and Clearfield Plus=tolerant to Beyond herbicide; DMR=downy mildew resistance; ExpressSun=tolerant to Express herbicide.

^cYield and oil content were corrected to 10% moisture at harvest. Hybrids in the top yield group (P<0.30) are bolded.

^dFarmers selecting a hybrid based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same).

Site Information

Collaborator: Josh Lechman

Planting Date: June 8, 2023

Harvest Date: November 3, 2023

Soil Type: Rago and kuma silt loams

GPS: 40.83789, -102.24254

Trial Comments: Planted into moisture. Good stands and emergence. Good weed control throughout the season. Radar estimates showed the trial received about 9.4 inches of rain from planting to harvest, and 21.3 inches since January 1st, which is 114% of the ten-year average (year-to-date).

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