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## Sunflower: 2009 South Dakota Hybrid Performance Trials

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EC 909  
Revised  
Annually

# SUNFLOWER

2009 South Dakota Hybrid Performance Trials

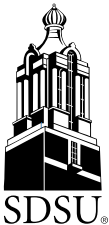
Oilseed  
Confection



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EC909-09: December 2009

# SUNFLOWER

## 2009 South Dakota Hybrid Performance Trials Oilseed and Confection

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Sunflower production is greatly affected by choice of hybrid. When selecting a hybrid, carefully consider characteristics such as seed yield potential, oil content, oil composition, maturity, stalk strength, and disease resistance. Choose hybrids with characteristics that best suit your needs and production practices.

### Yield

Evaluate as much performance information as possible when selecting a hybrid. Give more weight to information from trials close to home and look at relative performance over many locations and years. Performance averaged over many tests is called “yield stability.”

Good yield stability means that, while a hybrid may or may not be the best yielder at all locations, it ranks high in yielding potential at many locations/years. A hybrid that ranks in the upper 20% at all locations exhibits better yield stability than one that is the top yielder at two locations but ranks in the lower 40% at two other locations.

To determine if one hybrid is better than another for a given trait, use the least significant difference (LSD 5%) value at the bottom of each data column. The LSD 5% value is a statistical method of indicating if a trait like yield differs when comparing two hybrids. If two hybrids differ by more than the indicated LSD value for a given trait, they would most likely differ again when grown under similar conditions.

For example, if the Reliance oilseed test (table 8) could be repeated in 2010 exactly as it was in 2009, the yield ranking of a hybrid that yielded 2,721 lbs/A and one that yielded 2,425 lbs/A might change places, because their yield difference (296 lbs/A) is less than the indicated yield LSD value of 466 lbs/A. Within the accuracy level of the experiment, there was no statistical

difference in yield between the two hybrids when grown under the conditions that existed at Reliance in 2009. In contrast, a hybrid that yielded 2,215 lbs/A at Reliance in 2009 would likely be lower yielding than one that yielded 2,721 lbs/A if the two hybrids were grown again under similar conditions, because the difference between them in 2009 ( $2721 - 2215 = 506$  lbs/A) exceeded the LSD value of 466 lbs/A.

The coefficient of variability (C.V.) listed at the bottom of each data column is a relative measure of the amount of variation recorded for a particular trait expressed as a percentage of the mean for that trait. Generally, trials with low C.V. rates are more reliable for making hybrid choices than trials with higher C.V. rates. Trials with C.V. rates not exceeding 15-20% may be considered reliable.

Look at as many trials as possible. It is unlikely that environmental conditions of any particular test will be repeated in any future year.

### Oil Content and Composition

Among similar-yielding oilseed hybrids, select the one with the highest oil content. The oilseed crushing market pays a premium for over 40% oil (at 10% moisture) and discounts for less than 40% oil.

Oil type may also be important. Hybrids are available with “traditional” (linoleic), high-oleic, and mid-oleic (NuSun) oil composition. Markets may pay a premium based on the composition of the oil produced by a particular hybrid. Some companies offer guarantees for NuSun or high oleic levels. Consistency of oleic levels for particular hybrids is an important trait to consider.

## **Maturity**

Full-season hybrids generally yield higher than early hybrids.

Maturity is especially important if planting is delayed. Often, with delayed planting, only an early hybrid will mature and exhibit its full yield potential. Yield, oil content and test weight are often reduced when a hybrid is damaged by frost before it is fully mature. An earlier hybrid will likely be drier at harvest than a later hybrid, thus reducing drying costs. To spread risk and workload, consider planting several hybrids with different maturity dates.

## **Moisture Content**

Harvesting sunflower at moisture contents as high as 20–25% may reduce bird damage and seed shattering loss during harvest. However, seed must be dried to 9.5% or less for storage.

## **Disease Resistance**

The most economical and effective means of sunflower disease and insect control is the planting of resistant or tolerant hybrids and a minimum of four years rotation between successive sunflower crops.

Most sunflower hybrids in the United States have resistance to Verticillium wilt, races 1 and 2 of downy mildew, and to two or more races of rust. Some hybrids may also exhibit tolerance to sclerotinia head rot, Phomopsis, or sunflower midge. Clearfield® and ExpressSun™ hybrids are resistant to Beyond® and Express® herbicides, respectively. Consult the seed company for information on the reaction of a particular hybrid to the aforementioned and other pests that may pose risks in your growing area.

## **Other Factors**

Consider your contracting and marketing opportunities when selecting hybrids. Some hybrids may fit more than one market. For example, many oilseed hybrids may be equally suitable for crushing, hulling, or birdfeed.

# **2009 Trial Procedures**

## **Locations and Hybrids**

Oilseed hybrid sunflower trials were planted at five locations in South Dakota (Bison, Eureka, Miller, Onida, and Reliance). Entries in the oilseed sunflower trials included traditional linoleic oil hybrids, NuSun (mid-oleic) hybrids, and high oleic hybrids. Non-oilseed (confection) sunflower trials were conducted at Miller and Onida. Test locations are indicated on the map in figure 1. Trial sites for each of the hybrids tested in 2009 appear in tables 2 and 3.

## **Climate**

A summary of climate conditions near the sunflower test sites is presented in table 1. The 2009 growing season began with below-normal precipitation and temperature in May. It remained drier than usual through June at Miller and Onida, but was wetter than usual at the other sites in June. July brought slightly above normal rainfall to most sites. August was somewhat drier than normal at Bison, Eureka, and Miller, but wetter than normal at Onida and Reliance. September was drier than normal at all locations except Eureka, while October was wetter and much cooler than normal at all locations. Miller had virtually no rain from August 10 until October 1, limiting yield and reducing test weight. Summer temperatures were generally cooler than normal, but September brought above-normal temperatures. The first killing frost (<24°F) occurred on October 9–10 at all locations, which was near normal at Eureka and Reliance, but 4–8 days earlier than normal at Miller, Onida, and Bison.

## **Experimental Methods**

Plots at all locations consisted of four rows 30-feet long, spaced 30-inches apart. The center two rows of each plot were harvested. The plot layout was in a randomized complete block design with four replications at each location. The experiments were randomized for a nearest neighbors statistical analysis, which removes effects of field trends (see *Crop Science* 34:62–66).

Seed of most of the hybrids entered in the trials was pre-treated with Cruiser insecticide, and most was also treated with fungicide. Seed treatments used on individual hybrids are listed in tables 2 and 3. All trials were seeded no-till. The previous crop at Eureka and Miller was corn; at Bison, Reliance, and Onida, it was wheat. Plots were over-seeded and thinned to a plant population of approximately 17,400 plants/A (Onida and Bison) or 16,300 plants/A (Miller and Reliance). Thinning was not adequate at Eureka, due to an inexperienced crew, so stand counts were made prior to harvest. Plant population averaged 23,600 plants/A at Eureka. Stands were good everywhere except Reliance. Miller had a low drainage area through the middle of the third replication of the oilseed trial, which reduced stands and stunted plants in that area. The third replication at Miller was therefore excluded from all oilseed statistical analyses; however, the yield data were still too variable for publication.

Flowering was recorded at Onida as the number of days from planting to 50% ray petals extended. Days from planting to physiological maturity (rated visually) was also recorded at Onida. Plant height and lodging notes were taken at all locations

immediately before harvest. Lodging was low at all locations except Bison for most hybrids. Bison had considerable lodging in some plots; the lodging appeared to be mainly due to deer/antelope damage. The fourth replication had the most damage and was therefore excluded from yield and lodging analyses, as were any plots in the other three replications with greater than 25% lodging (5 additional plots).

Plots at Onida, Miller, Eureka, and Reliance were harvested with a Gleaner Model K combine fitted with a 2-row all row crop header. Plots at Bison were harvested with a Wintersteiger Delta plot combine fitted with a HarvestMaster GrainGauge. Seed yields were adjusted to a 10%-moisture basis. Oil content was determined by NMR analysis, using a Bruker minispec. Oil values for NuSun and high oleic hybrids were adjusted for oleic acid content. Hulling quality was measured at Onida on selected hybrids by passing a 1-pint seed sample over 14/64 and 13/64 round-hole screens.

A 1-pint sub-sample of seed from each plot of the confection trials was passed over 22/64, 20/64, and 18/64 round-hole screens to determine percent large seed. Nutmeat percent was determined by weighing 20 whole seeds from each plot, dehulling, and weighing the 20 dehulled kernels.

## Results

Data from each location and combined over locations are contained in tables 4 through 12. Yields of oilseed hybrids were highest at Eureka, averaging 2,381 lbs/A over all hybrids tested, with an average oil content of 45.8%. The lowest yield and oil was measured at Bison, which averaged 890 lbs/A and 45.5% oil. Confection seed yield averaged 2,205 lbs/A at Onida and were too variable for publication at Miller. In the tables that follow, hybrids are listed alphabetically by brand.

**Presentation of data in this report on the hybrids tested does not imply approval or endorsement by SDSU to the exclusion of other varieties that may be suitable. South Dakota State University approves the reproduction of any table in this publication only if no portion is deleted.**

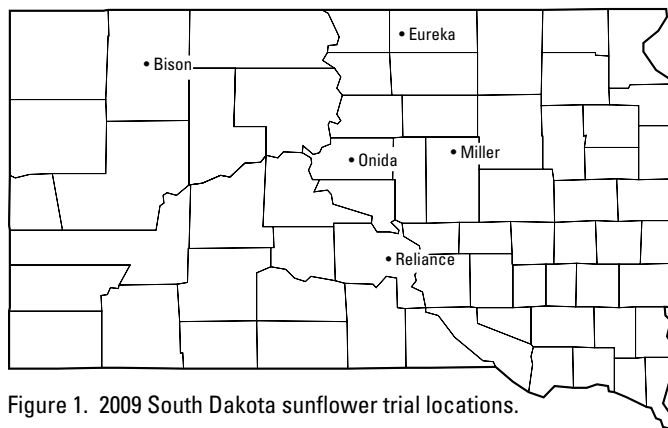


Figure 1. 2009 South Dakota sunflower trial locations.

**Table 1. Climate summary for weather stations nearest to 2009 South Dakota sunflower test sites and departures from normal.**

Location- Month	2009 Temperature			Total Precip (in.)	Departure from Normal <sup>^</sup>			Precip (in.)
	Avg Max.	Avg Min.	Mean		Max Temp	Min Temp	Avg Temp	
	-----( <sup>°</sup> F)-----				-----( <sup>°</sup> F)-----			
<b>Bison*</b>								
May	66.3	40.5	53.9	1.43	-3.2	-3.2	-2.7	-1.29
June	71.1	49.1	60.2	3.40	-7.8	-3.9	-5.8	0.58
July	78.8	54.2	66.5	1.77	-7.2	-4.2	-5.7	-0.50
August	79.6	52.7	66.1	1.00	-6.6	-4.2	-5.5	-0.47
September	77.3	49.6	62.7	0.38	2.5	3.1	2.0	-0.82
October	44.6	29.9	36.6	2.02	-15.9	-5.4	-11.3	0.56
<b>Eureka*</b>								
May	69.4	40.8	55.1	1.13	-0.4	-2.8	-1.6	-1.50
June	74.4	50.4	62.4	4.31	-3.8	-2.5	-3.2	1.14
July	79.0	55.0	67.0	3.86	-5.7	-3.0	-4.4	1.08
August	80.2	55.8	68.0	1.71	-3.6	-0.4	-2.0	-0.59
September	75.9	49.3	62.6	1.46	2.6	3.9	3.2	0.03
October	45.3	27.1	36.2	3.54	-13.8	-6.5	-10.2	1.88
<b>Miller*</b>								
May	69.2	41.7	55.4	1.09	0.8	-3.8	-1.6	-2.05
June	74.9	53.2	64.0	2.20	-3.3	-2.1	-2.8	-0.70
July	79.1	56.0	67.5	3.05	-6.0	-4.6	-5.4	0.45
August	79.4	54.8	67.1	1.56	-4.3	-3.0	-3.7	-0.45
September	74.0	51.2	62.6	0.00	-0.1	3.7	1.8	-1.80
October	45.9	31.8	38.9	3.59	-14.8	-3.1	-8.9	1.82
<b>Onida 4 NW*</b>								
May	71.0	41.4	56.2	0.89	0.6	-2.9	-1.2	-1.96
June	76.7	52.0	64.4	2.16	-3.5	-1.6	-2.6	-0.95
July	82.3	55.7	69.0	3.03	-5.3	-3.1	-4.2	0.34
August	81.0	54.5	67.8	3.35	-4.8	-2.5	-3.6	1.21
September	76.7	51.0	63.8	0.23	0.7	4.7	2.6	-1.31
October	47.1	30.6	38.9	3.11	-14.1	-3.9	-9.0	1.53
<b>Reliance*</b>								
May	72.0	44.7	59.0	0.57	1.1	0.0	1.2	-3.05
June	76.5	55.3	66.0	4.99	-4.5	0.9	-1.7	1.59
July	81.7	57.7	70.0	3.11	-7.0	-2.1	-4.3	0.19
August	81.8	57.7	69.7	5.05	-5.8	-0.5	-3.2	2.77
September	75.7	53.1	64.6	0.82	-1.9	5.1	1.8	-1.16
October	49.7	34.1	41.7	2.22	-13.3	-1.4	-7.6	0.46

\*Based on data from the High Plains Regional Climate Center, University of Nebraska, Lincoln. Observations are from sites as close to the actual test plot sites as available. Temperature and/or precipitation at the actual test plot sites may have differed from the values shown above.

<sup>^</sup>Departures from normal were determined by comparing 2009 observations to 30-yr averages (1971–2000) for each site.

**Table 2. Oilseed sunflower hybrids tested in South Dakota - 2009.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed <sup>2</sup> Treatmnt	Location			
				Bison	Eureka	Onida	Reliance
CHS Sunflower	08EXP01	Trad.	CDM			X	
Croplan Genetics	306 DMR NS	NS,DM	CM	X	X	X	X
Croplan Genetics	3080 DMR NS	NS,DM	CM	X	X	X	X
Croplan Genetics	356A NS	NS	CM	X	X	X	X
Croplan Genetics	369 DMR NS	NS,DM	CM	X	X	X	X
Croplan Genetics	378 DMR NS	NS,DM	CM	X	X	X	X
Croplan Genetics	460 E NS	NS,Ex	CM	X	X	X	X
Croplan Genetics	555 CL DMR NS	NS,CL,DM	CM	X	X	X	X
Dahlgren & Co.	4416CL ConOil	NS,CL	Yes		X	X	
Dahlgren & Co.	4455 Con Oil	NS	Yes		X	X	
King Seed Inc.	SunKing 4404 NSCL	NS,CL	CM	X	X	X	X
King Seed Inc.	SunKing 4444 NS	NS	CM	X	X	X	X
Syngenta	DKF34-33 NS/DM	NS,DM	CM	X	X	X	X
Syngenta	DKF34-80CL	NS,CL	CM	X	X	X	X
Syngenta	DKF37-31 NS	NS	CM	X	X	X	X
Syngenta	DKF37-32 NS	NS	CM	X	X	X	X
Syngenta	DKF38-45 HO	HO	CM	X	X	X	X
Syngenta	DKF38-75 NS	NS	CM	X	X	X	X
Syngenta	DKF39-80CL	NS,CL	CM	X	X	X	X
Syngenta	IS7120 HO/DM	HO,DM	CM	X	X	X	X
Syngenta	MH9001CL	NS,CL	CM	X	X	X	X
Syngenta	MH9002CL	NS,CL	CM	X	X	X	X
Mycogen Seeds	8D310	NS			X	X	X
Mycogen Seeds	8D481	NS			X	X	X
Mycogen Seeds	8H288CLDM	HO,CL			X	X	
Mycogen Seeds	8H449DM	HO,DM		X	X	X	X
Mycogen Seeds	8N187	NS		X	X	X	X
Mycogen Seeds	8N358CLDM	NS,CL,DM		X	X	X	X
Mycogen Seeds	8N433DM	NS,DM		X	X	X	X
Mycogen Seeds	8N453DM	NS,DM			X	X	X
Mycogen Seeds	8N510	NS		X	X	X	X
Pannar Seed, Inc	PAN7813 NS	NS			X	X	X
Pannar Seed, Inc	PAN7924 NS	NS			X	X	X
Pannar Seed, Inc	PAN8466 NS/CL	NS,CL			X	X	X
Pannar Seed, Inc	PEX7803	HO			X	X	X
Pannar Seed, Inc	PEX7904	HO			X	X	X
Pioneer Hi-Bred	Pioneer Brand 63M91	NS		X	X	X	X
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex		X	X	X	X
Pioneer Hi-Bred	Pioneer Brand 64H41	HO		X	X	X	X
Seeds 2000	Badger CL	NS,CL	C/apron		X	X	X
Seeds 2000	Barracuda	NS,CL	C/apron		X	X	X
Seeds 2000	Blazer CL	NS,CL	C/apron		X	X	X
Seeds 2000	Firebird	NS,Ex	C/apron		X	X	X
Seeds 2000	Sierra	HO	C/apron		X	X	X
Triumph Seed Co., Inc	660CL	NS,CL					
Triumph Seed Co., Inc	845HO	HO			X	X	
Triumph Seed Co., Inc	859HOCL	HO,CL					
Triumph Seed Co., Inc	s668 (TRXs8325)	NS,SS				X	X
Triumph Seed Co., Inc	s671	NS,SS		X	X	X	X



**Table 2. Oilseed sunflower hybrids tested in South Dakota - 2009. (Continued)**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed <sup>2</sup> Treatmnt	Location			
				Bison	Eureka	Onida	Reliance
Triumph Seed Co., Inc	s674	NS,SS		X	X	X	X
Triumph Seed Co., Inc	s678	NS,SS		X	X	X	X
Triumph Seed Co., Inc	s878H	HO,SS			X	X	X
Triumph Seed Co., Inc	s655	NS,SS,DM		X	X	X	X
Triumph Seed Co., Inc	TRXs9422	NS,SS		X	X	X	X
Triumph Seed Co., Inc	TRXs9423	NS,SS			X	X	X
Triumph Seed Co., Inc	TRXs9425	NS,SS				X	X
Triumph Seed Co., Inc	s680CL	NS,CL,SS		X	X	X	X
Triumph Seed Co., Inc	TRX 8341	NS					
USDA (check)	894	Trad.		X	X	X	X
USDA (check)	cms HA412/RHA 377	Trad.			X		X

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

<sup>2</sup>C = Cruiser, CDM = Cruiser DM Pak, CM = CruiserMaxx Sunflower.

**Table 3. Confection sunflower hybrids tested in South Dakota - 2009.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed <sup>2</sup> Treatment	Location	
				Miller	Onida
CHS Sunflower	RH 1121	Conf.	CDM	X	X
CHS Sunflower	RH 3126RT	Conf.	CDM	X	X
CHS Sunflower	RH 400CL	Conf./CL	CDM	X	X
Croplan Genetics	179	Conf.	C2-MX	X	X
Dahlgren & Co.	9579	Conf.	CM	X	X
Dahlgren & Co.	9592	Conf.	CM	X	X
Dahlgren & Co.	95EXCL	Conf./CL	CM	X	X
Mycogen Seeds	8C451	Conf.		X	X
Red River Commodities	RRC 2215	Conf.	CM	X	X
Red River Commodities	RRC 2216	Conf.	CM	X	X
Red River Commodities	RRC 2217	Conf.	CM	X	X
Seeds 2000	Jaguar	Conf./CL	C/apron	X	X
Seeds 2000	Panther II	Conf.	C/apron	X	X
Seeds 2000	X9681	Conf.	apron	X	X
Triumph Seed Co., Inc	747C	Conf.		X	
Triumph Seed Co., Inc	777C	Conf.		X	
USDA	924 (check)	Conf.		X	X

<sup>1</sup>Type: Conf. = Confection, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

<sup>2</sup>C = Cruiser, CDM = Cruiser DM Pak, CM = CruiserMaxx Sunflower.

**Table 4. 2009 - Sunflower - Oilseed - Bison, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	2009	Seed Yield		Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
				2-yr Avg. -----(lb/a)-----	3-yr Avg.						
Croplan	306 DMR NS	NS,DM	944	1406	--	45.8	51	6.4	4.4	28.4	16.4
Croplan	3080 DMR NS	NS,DM	1029	1518	--	48.4	51	11.8	6.3	29.7	18.0
Croplan	356A NS	NS	910	--	--	46.0	48	1.6	5.9	28.6	17.8
Croplan	369 DMR NS	NS,DM	817	1164	--	44.8	53	4.4	6.9	27.2	16.0
Croplan	378 DMR NS	NS,DM	999	1438	--	43.6	55	3.4	13.0	29.7	17.6
Croplan	460 E NS	NS,Ex	637	--	--	46.1	52	6.0	9.8	29.0	17.6
Croplan	555 CL DMR NS	NS,CL,DM	710	--	--	46.7	53	5.3	7.4	26.5	17.3
King Seed	SunKing 4404 NSCL	NS,CL	832	1539	--	44.3	48	1.1	7.4	29.4	17.8
King Seed	SunKing 4444 NS	NS	882	--	--	42.1	54	3.3	9.9	29.2	15.3
Syngenta	DKF34-33 NS/DM	NS,DM	667	1122	1031	46.3	48	6.3	5.9	34.2	16.2
Syngenta	DKF34-80CL	NS,CL	614	1122	1196	45.5	49	10.7	5.3	31.0	17.2
Syngenta	DKF37-31 NS	NS	796	1026	1154	45.0	50	9.4	7.6	29.9	16.9
Syngenta	DKF37-32 NS	NS	820	--	--	44.3	47	7.5	7.0	31.3	17.0
Syngenta	DKF38-45 HO	HO	872	1417	1567	47.4	48	2.8	8.3	31.3	16.7
Syngenta	DKF38-75 NS	NS	827	1420	1506	42.9	50	7.2	7.8	28.2	15.7
Syngenta	DKF39-80CL	NS,CL	643	1155	--	45.1	57	5.3	7.7	29.0	15.9
Syngenta	IS7120 HO/DM	HO,DM	1020	1346	1316	44.8	49	5.8	5.5	31.3	17.2
Syngenta	MH9001CL	NS,CL	821	--	--	45.4	52	5.8	11.8	29.3	16.5
Syngenta	MH9002CL	NS,CL	785	--	--	44.6	50	4.0	8.2	29.6	18.1
Mycogen Seeds	8H449DM	HO,DM	1296	1713	1566	48.7	57	1.2	10.9	31.3	17.8
Mycogen Seeds	8N187	NS	927	1369	--	44.3	46	3.3	6.7	31.1	17.3
Mycogen Seeds	8N358CLDM	NS,CL,DM	1058	1469	1201	45.4	46	10.4	7.4	32.2	16.8
Mycogen Seeds	8N433DM	NS,DM	1023	--	--	47.1	51	8.8	7.6	27.4	17.7
Mycogen Seeds	8N510	NS	1266	1426	1494	45.4	50	0.0	9.4	26.5	18.2
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	628	--	--	45.2	51	1.8	11.0	31.8	17.1
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	983	--	--	45.2	50	0.0	10.3	30.7	17.8
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	737	--	--	45.0	52	6.2	10.3	29.5	16.8
Triumph Seed	s671	NS,SS	1185	1582	--	45.3	37	3.2	7.9	28.0	18.4
Triumph Seed	s674	NS,SS	1302	--	--	46.5	39	0.5	9.1	27.4	18.5
Triumph Seed	s678	NS,SS	1086	1435	1506	45.0	45	2.9	7.7	27.6	16.9
Triumph Seed	s655	NS,SS,DM	911	--	--	45.7	33	1.1	8.0	30.5	17.9
Triumph Seed	TRXs9422	NS,SS	728	--	--	45.2	37	1.6	7.8	24.6	17.7
Triumph Seed	s680CL	NS,CL,SS	876	--	--	44.9	36	2.9	9.6	29.5	17.6
USDA (check)	894	Trad.	619	856	860	47.7	44	2.4	9.9	31.3	16.1
Grand Mean			890	1343	1309	45.5	48	4.5	8.2	29.5	17.2
LSD 5%			289	305	267	1.9	4	ns	1.6	1.9	ns
C.V.			19.9	21.3	20.7	3.0	6.1	100.9	14.0	4.5	6.8

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature. Yield is reported at 10% moisture. Oil % is adjusted for oleic acid content. Planted June 4, 2009. Harvested November 9, 2009. Previous crop = wheat.

**Table 5. 2009 - Sunflower - Oilseed - Eureka, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield			Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
			2009	2-yr Avg. (lb/a)	3-yr Avg.						
Croplan	306 DMR NS	NS,DM	1789	1946	--	45.1	59	0.8	15.1	26.0	20.5
Croplan	3080 DMR NS	NS,DM	2426	2129	--	46.5	57	4.3	14.6	26.4	26.3
Croplan	356A NS	NS	2771	--	--	44.9	56	1.3	16.2	28.1	20.1
Croplan	369 DMR NS	NS,DM	2527	2281	--	44.6	63	2.6	16.4	27.4	23.3
Croplan	378 DMR NS	NS,DM	2961	2399	--	45.5	65	2.2	18.8	26.9	22.3
Croplan	460 E NS	NS,Ex	2203	--	--	46.7	61	1.1	16.4	28.0	21.9
Croplan	555 CL DMR NS	NS,CL,DM	2449	--	--	45.0	65	0.3	15.9	26.8	25.0
Dahlgren	4416CL ConOil	NS,CL	2164	--	--	42.3	72	2.6	15.8	26.6	21.4
Dahlgren	4455 Con Oil	NS	2542	--	--	43.8	64	0.8	17.2	27.7	22.2
King Seed	SunKing 4404 NSCL	NS,CL	2400	2275	2210	45.9	67	3.7	15.3	27.3	26.3
King Seed	SunKing 4444 NS	NS	2872	--	--	44.2	61	4.5	16.3	26.0	23.4
Syngenta	DKF34-33 NS/DM	NS,DM	2294	2215	2236	46.1	63	4.2	15.0	28.8	20.6
Syngenta	DKF34-80CL	NS,CL	1948	1867	1832	46.0	62	0.4	14.7	26.7	22.3
Syngenta	DKF37-31 NS	NS	2385	2405	2316	47.7	60	1.2	15.9	28.5	24.4
Syngenta	DKF37-32 NS	NS	2506	--	--	45.9	59	0.3	15.8	28.9	27.0
Syngenta	DKF38-45 HO	HO	2729	2566	2570	45.5	56	0.3	16.6	29.2	23.7
Syngenta	DKF38-75 NS	NS	2221	2152	2223	45.9	60	5.6	17.8	26.0	20.2
Syngenta	DKF39-80CL	NS,CL	2224	2053	--	44.4	72	3.1	16.4	26.2	19.8
Syngenta	IS7120 HO/DM	HO,DM	1743	1809	1957	46.1	59	1.1	15.6	25.2	27.3
Syngenta	MH9001CL	NS,CL	2414	--	--	46.8	65	0.0	18.9	27.1	28.8
Syngenta	MH9002CL	NS,CL	2579	--	--	44.5	67	2.1	17.0	29.8	25.6
Mycogen Seeds	8D310	NS	2437	--	--	42.2	62	0.8	16.5	28.0	23.7
Mycogen Seeds	8D481	NS	2484	2414	--	44.7	67	1.3	16.8	28.1	25.3
Mycogen Seeds	8H288CLDM	HO,CL,DM	2180	--	--	47.4	61	1.3	14.6	28.0	24.9
Mycogen Seeds	8H449DM	HO,DM	2647	2366	2433	47.6	65	0.0	17.8	28.7	24.6
Mycogen Seeds	8N187	NS	2163	1974	--	45.6	54	2.2	13.7	26.9	22.8
Mycogen Seeds	8N358CLDM	NS,CL,DM	2127	2090	2242	48.0	63	1.3	15.0	26.9	27.0
Mycogen Seeds	8N433DM	NS,DM	2711	--	--	45.5	62	2.5	15.9	26.2	23.7
Mycogen Seeds	8N453DM	NS,DM	2302	2336	2243	46.0	65	0.0	16.6	27.9	24.2
Mycogen Seeds	8N510	NS	2522	2366	2558	44.4	65	2.0	15.2	26.0	25.0
Pannar Seed	PAN7813 NS	NS	2413	2222	2262	45.5	59	0.9	17.9	26.9	25.6
Pannar Seed	PAN7924 NS	NS	2591	2191	2254	45.5	67	3.7	17.5	27.0	24.3
Pannar Seed	PAN8466 NS/CL	NS,CL	1929	--	--	44.7	65	6.1	15.7	26.6	23.3
Pannar Seed	PEX7803	HO	2414	--	--	46.8	58	5.4	17.6	27.9	25.5
Pannar Seed	PEX7904	HO	2319	--	--	46.0	60	2.7	18.5	28.0	23.1
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	1730	--	--	45.6	63	0.4	15.9	26.7	23.1
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	2165	--	--	45.8	61	0.0	17.4	27.6	25.0
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	2419	--	--	46.2	66	0.3	17.2	28.0	26.2
Seeds 2000	Badger CL	NS,CL	2319	--	--	43.1	66	2.6	15.5	26.8	22.6
Seeds 2000	Barracuda	NS,CL	2476	2202	2191	44.0	61	0.0	18.9	26.5	18.6
Seeds 2000	Blazer CL	NS,CL	2418	2182	2116	44.6	68	6.1	17.2	26.3	25.0
Seeds 2000	Firebird	NS,Ex	2277	2277	2435	45.3	57	0.5	17.3	26.6	20.4
Seeds 2000	Sierra	HO	1893	1850	1972	45.0	59	7.1	15.5	26.7	24.9
Triumph Seed	845HO	HO	2319	2186	--	47.1	65	2.6	18.8	26.0	21.2
Triumph Seed	s671	NS,SS	2473	2329	--	48.0	46	0.5	16.9	27.7	20.0

**Table 5. 2009 - Sunflower - Oilseed - Eureka, S.D. (Continued)**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield			Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
			2009	2-yr Avg. (lb/a)	3-yr Avg.						
Triumph Seed	s674	NS,SS	2900	--	--	48.9	43	1.9	16.2	27.9	27.7
Triumph Seed	s678	NS,SS	2795	2537	2374	47.9	50	1.8	18.4	29.2	26.3
Triumph Seed	s878H	HO,SS	2701	2499	--	46.6	54	0.8	17.1	27.1	24.0
Triumph Seed	s655	NS,SS,DM	2438	2347	--	47.7	40	1.6	15.8	27.8	25.5
Triumph Seed	TRXs9422	NS,SS	2370	--	--	47.2	41	1.2	17.3	27.8	22.9
Triumph Seed	TRXs9423	NS,SS	2535	--	--	46.9	42	2.8	17.7	27.1	19.0
Triumph Seed	s680CL	NS,CL,SS	2840	--	--	47.8	44	3.3	17.3	28.7	21.0
USDA (check)	894	Trad.	2243	1949	1845	48.1	52	1.2	17.2	27.2	22.5
USDA (check)	cms HA412/RHA 377	Trad.	1854	--	--	46.1	60	0.7	16.6	27.0	21.6
Grand Mean			2381	2214	2225	45.8	60	2.0	16.6	27.3	23.6
LSD 5%			581	340	265	2.0	5	3.7	1.6	1.5	ns
C.V.			17.5	15.2	14.6	3.1	6.2	132.8	7.1	3.9	17.3

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

Yield is reported at 10% moisture. Oil % is adjusted for oleic acid content.

Planted May 27, 2009. Harvested November 6, 2009. Previous crop = corn.



**Table 6. 2009 - Sunflower - Oilseed - Miller, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed <sup>2</sup> Yield (lb/a)	Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
CHS Sunflower	08EXP01	Trad.	43.0	62	1.2	11.7	19.7	16.3	
Croplan	306 DMR NS	NS,DM	46.3	60	1.2	12.1	23.0	16.3	
Croplan	3080 DMR NS	NS,DM	47.0	58	4.2	12.0	25.6	16.3	
Croplan	356A NS	NS	47.0	57	0.0	12.5	25.0	16.3	
Croplan	369 DMR NS	NS,DM	45.5	64	0.0	12.9	23.7	16.3	
Croplan	378 DMR NS	NS,DM	46.6	65	7.3	13.3	24.8	16.3	
Croplan	460 E NS	NS,Ex	48.0	61	0.0	13.1	25.2	16.3	
Croplan	555 CL DMR NS	NS,CL,DM	45.4	64	2.4	12.3	22.4	16.3	
King Seed	SunKing 4404 NSCL	NS,CL	44.1	63	2.4	12.3	24.7	16.3	
King Seed	SunKing 4444 NS	NS	45.0	60	3.6	11.9	22.5	16.3	
Syngenta	DKF34-33 NS/DM	NS,DM	47.5	57	6.0	13.5	25.9	16.3	
Syngenta	DKF34-80CL	NS,CL	46.1	58	1.8	11.6	20.9	16.3	
Syngenta	DKF37-31 NS	NS	48.1	61	0.0	13.1	27.4	16.3	
Syngenta	DKF37-32 NS	NS	44.4	60	0.0	13.1	25.4	16.3	
Syngenta	DKF38-45 HO	HO	46.9	56	0.0	12.6	24.4	16.3	
Syngenta	DKF38-75 NS	NS	46.3	64	3.3	12.9	26.3	16.3	
Syngenta	DKF39-80CL	NS,CL	44.5	65	1.2	11.3	22.8	16.3	
Syngenta	IS7120 HO/DM	HO,DM	45.5	57	1.2	12.3	23.4	16.3	
Syngenta	MH9001CL	NS,CL	46.1	61	0.0	13.4	24.4	16.3	
Syngenta	MH9002CL	NS,CL	45.2	59	1.8	13.3	26.6	16.3	
Mycogen Seeds	8D310	NS	42.1	64	4.8	13.1	23.4	16.3	
Mycogen Seeds	8D481	NS	44.0	63	0.0	13.2	23.1	16.3	
Mycogen Seeds	8H288CLDM	HO,CL	46.3	61	1.8	12.0	22.4	16.3	
Mycogen Seeds	8H449DM	HO,DM	47.9	65	0.0	13.1	24.6	16.3	
Mycogen Seeds	8N187	NS	44.6	52	0.0	12.4	20.6	16.3	
Mycogen Seeds	8N358CLDM	NS,CL,DM	45.4	60	1.8	11.8	22.0	16.3	
Mycogen Seeds	8N433DM	NS,DM	47.7	66	4.2	12.3	22.7	16.3	
Mycogen Seeds	8N453DM	NS,DM	45.4	61	0.0	12.5	22.2	16.3	
Mycogen Seeds	8N510	NS	45.6	62	0.0	12.3	23.6	16.3	
Pannar Seed	PAN7813 NS	NS	45.3	58	0.0	12.2	24.1	16.3	
Pannar Seed	PAN7924 NS	NS	43.4	58	0.6	12.5	23.3	16.3	
Pannar Seed	PAN8466 NS/CL	NS,CL	44.1	61	1.2	12.0	21.8	16.3	
Pannar Seed	PEX7803	HO	47.8	52	0.8	12.9	24.3	14.9	
Pannar Seed	PEX7904	HO	44.5	58	1.2	12.5	21.9	14.0	
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	46.6	63	0.0	12.3	21.9	14.3	
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	48.4	57	0.6	13.3	25.8	15.0	
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	45.2	65	1.8	12.9	22.0	15.3	
Seeds 2000	Badger CL	NS,CL	43.6	64	0.0	12.2	25.4	15.2	
Seeds 2000	Barracuda	NS,CL	46.4	60	0.0	12.7	24.3	14.2	
Seeds 2000	Blazer CL	NS,CL	46.0	63	0.9	12.5	23.5	14.4	
Seeds 2000	Firebird	NS,Ex	45.6	57	0.0	13.0	26.0	16.3	
Seeds 2000	Sierra	HO	44.6	57	0.6	12.9	22.4	16.3	
Triumph Seed	660CL	NS,CL	46.9	68	0.6	12.5	24.7	16.3	
Triumph Seed	859HOCL	HO,CL	47.2	61	0.0	12.7	26.1	16.3	
Triumph Seed	s668	NS,SS	50.7	51	0.0	13.0	27.2	17.6	
Triumph Seed	s671	NS,SS	46.4	47	0.0	12.7	24.4	16.3	
Triumph Seed	s674	NS,SS	47.8	48	0.0	13.1	24.5	16.3	
Triumph Seed	s678	NS,SS	48.1	50	0.0	13.2	26.1	16.3	
Triumph Seed	s878H	HO,SS	47.5	51	0.0	13.4	25.9	16.3	
Triumph Seed	s655	NS,SS,DM	48.1	45	0.0	12.6	23.0	16.3	

**Table 6. 2009 - Sunflower - Oilseed - Miller, S.D. (Continued)**

<b>Brand</b>	<b>Hybrid</b>	<b>Hybrid Type<sup>1</sup></b>	<b>Seed<sup>2</sup> Yield (lb/a)</b>	<b>Oil Cont. (%)</b>	<b>Plant Height (inch)</b>	<b>Lodge (%)</b>	<b>Harv. Moist. (%)</b>	<b>Test Wt. (lb/bu)</b>	<b>Pop. x1000 Plt/a (plants)</b>
Triumph Seed	TRXs9422	NS,SS		48.2	42	0.0	13.4	24.2	16.3
Triumph Seed	TRXs9423	NS,SS		47.9	45	0.0	13.1	25.4	16.3
Triumph Seed	TRXs9425	NS,SS		47.2	42	0.0	12.9	25.7	16.3
Triumph Seed	s680CL	NS,CL,SS		46.2	38	1.2	13.4	29.4	16.3
Triumph Seed	TRX 8341	NS		46.3	56	4.2	12.8	24.1	16.3
USDA (check)	USDA 894 (check)	Trad.		47.5	49	1.8	12.3	24.4	14.6
Grand Mean				46.2	58	1.2	12.7	24.1	16.1
LSD 5%				2.0	5	3.3	0.6	2.2	ns
C.V.				3.1	5.4	174	3.0	5.6	7.2

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

<sup>2</sup>Seed yields not reported due to high C.V.

Oil % is adjusted for oleic acid content.

Planted June 4, 2009. Harvested November 16, 2009.

**Table 7. 2009 - Sunflower - Oilseed - Onida, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield			Oil Cont. (%)	Days to		Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)	Hulling <sup>2</sup> Quality
			2009	2008	2-yr Avg.		Flwr	Mat.						
			----- (lb/a) -----			--- (days) ---								
CHS Sunflower	08EXP01	Trad.	2202	--	--	38.8	66	105	64	2.5	12.0	26.7	16.5	
Croplan	306 DMR NS	NS,DM	2195	1809	2002	41.8	63	104	63	1.3	12.0	29.7	17.4	
Croplan	3080 DMR NS	NS,DM	2298	1603	1951	45.3	63	104	64	2.1	10.0	29.3	17.4	
Croplan	356A NS	NS	2228	--	--	42.5	66	105	65	0.8	12.5	29.2	17.4	
Croplan	369 DMR NS	NS,DM	2103	1859	1981	43.7	65	103	69	0.4	12.1	28.3	17.4	
Croplan	378 DMR NS	NS,DM	2486	1400	1943	43.2	66	107	72	0.9	12.9	28.4	17.0	
Croplan	460 E NS	NS,Ex	2303	--	--	43.3	67	105	70	2.5	12.7	28.6	17.4	
Croplan	555 CL DMR NS	NS,CL,DM	1930	--	--	42.5	67	103	70	1.7	12.8	28.5	17.2	
Dahlgren	4416CL ConOil	NS,CL	2312	--	--	38.0	66	104	72	3.5	13.4	27.5	16.3	
Dahlgren	4455 Con Oil	NS	2106	1991	2049	39.8	64	100	68	1.7	12.9	28.0	17.4	
King Seed	SunKing 4404 NSCL	NS,CL	1946	1554	1750	41.4	67	110	68	5.8	12.9	27.9	17.4	
King Seed	SunKing 4444 NS	NS	2230	--	--	43.2	66	104	66	6.3	12.9	28.2	17.4	
Syngenta	DKF34-33 NS/DM	NS,DM	2320	1718	2019	44.9	63	103	63	2.9	11.1	30.4	17.4	
Syngenta	DKF34-80CL	NS,CL	2263	1910	2087	44.2	65	101	66	2.9	10.8	28.6	17.4	
Syngenta	DKF37-31 NS	NS	2126	2002	2064	43.3	65	104	63	2.5	12.0	29.6	17.4	
Syngenta	DKF37-32 NS	NS	2247	--	--	43.1	65	103	62	2.5	12.4	29.5	17.4	
Syngenta	DKF38-45 HO	HO	1900	1916	1908	45.2	64	101	63	2.1	12.0	29.9	17.4	
Syngenta	DKF38-75 NS	NS	2217	2020	2118	42.6	66	104	66	12.1	12.5	29.6	17.4	
Syngenta	DKF39-80CL	NS,CL	1963	1216	1589	42.0	67	104	76	3.8	13.0	29.0	17.4	
Syngenta	IS7120 HO/DM	HO,DM	2210	1722	1966	44.0	62	101	61	2.9	11.7	29.4	17.4	
Syngenta	MH9001CL	NS,CL	2142	--	--	43.3	67	105	69	2.5	14.3	29.8	17.4	
Syngenta	MH9002CL	NS,CL	2133	--	--	42.1	65	102	69	0.0	12.6	30.0	17.4	
Mycogen Seeds	8D310	NS	2435	--	--	41.9	62	97	68	1.3	12.7	28.6	17.4	Excel.
Mycogen Seeds	8D481	NS	2039	2091	2065	43.7	65	105	69	1.7	12.4	29.1	17.4	Excel.
Mycogen Seeds	8H288CLDM	HO,CL	2208	--	--	44.1	61	103	66	2.1	12.0	29.4	16.8	
Mycogen Seeds	8H449DM	HO,DM	2027	1967	1997	45.3	65	105	67	0.8	13.3	29.5	17.4	
Mycogen Seeds	8N187	NS	2268	1619	1944	42.8	64	102	61	1.3	11.9	29.0	17.4	Excel.
Mycogen Seeds	8N358CLDM	NS,CL,DM	1925	1631	1778	44.8	63	102	64	2.9	12.4	30.0	17.4	
Mycogen Seeds	8N433DM	NS,DM	2128	--	--	45.7	65	103	67	1.7	11.5	28.7	17.4	Excel.
Mycogen Seeds	8N453DM	NS,DM	2150	1973	2062	45.6	64	102	68	3.5	12.6	30.3	17.0	
Mycogen Seeds	8N510	NS	2272	2075	2173	43.5	67	104	67	2.1	12.5	28.4	17.4	Excel.
Pannar Seed	PAN7813 NS	NS	2177	1665	1921	42.1	65	105	68	3.3	13.4	29.0	17.4	
Pannar Seed	PAN7924 NS	NS	2233	2113	2173	42.5	66	105	66	3.3	13.2	28.6	17.4	
Pannar Seed	PAN8466 NS/CL	NS,CL	1900	--	--	42.4	67	104	72	5.0	12.8	28.3	17.0	
Pannar Seed	PEX7803	HO	2271	--	--	42.3	65	105	60	4.6	13.3	28.9	17.4	
Pannar Seed	PEX7904	HO	2190	--	--	43.9	66	104	63	2.9	13.1	29.1	17.4	
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	2054	1524	1789	44.2	63	101	69	1.3	11.6	29.5	17.4	
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	2556	1793	2174	43.9	65	106	69	1.7	13.1	30.2	17.4	
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	2144	1653	1898	43.4	65	103	72	2.9	13.5	30.2	17.4	
Seeds 2000	Badger CL	NS,CL	2241	--	--	39.2	64	103	74	3.3	12.3	28.3	17.4	
Seeds 2000	Barracuda	NS,CL	2324	1972	2148	42.7	65	105	63	1.7	14.0	29.2	17.4	
Seeds 2000	Blazer CL	NS,CL	2109	1701	1905	41.9	67	103	70	1.7	12.2	27.4	17.0	
Seeds 2000	Firebird	NS,Ex	1889	2072	1980	41.5	67	107	65	4.2	13.1	28.5	17.4	
Seeds 2000	Sierra	HO	1869	1588	1728	40.8	68	107	67	6.7	11.6	26.3	17.4	
Triumph Seed	845HO	HO	2329	2163	2246	44.0	66	104	67	4.2	13.2	28.4	17.4	
Triumph Seed	s668	NS,SS	2421	1721	2071	44.7	66	111	50	0.8	12.9	29.4	17.4	
Triumph Seed	s671	NS,SS	1873	1711	1792	44.6	68	107	51	2.3	12.6	30.2	18.9	
Triumph Seed	s674	NS,SS	1734	--	--	45.1	70	112	48	1.7	12.8	29.1	17.4	
Triumph Seed	s678	NS,SS	2052	1985	2018	44.6	68	112	54	0.8	13.0	29.7	17.4	
Triumph Seed	s878H	HO,SS	2274	1758	2016	43.7	68	111	56	1.4	12.6	30.3	16.5	

**Table 7. 2009 - Sunflower - Oilseed - Onida, S.D. (Continued)**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield			Oil Cont. (%)	Days to		Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)	Hulling <sup>2</sup> Quality
			2009	2008	2-yr Avg.		Flwr	Mat.						
			----- (lb/a) -----			--- (days) ---								
Triumph Seed	s655	NS,SS,DM	1935	--	--	42.6	67	108	42	0.4	12.7	29.7	17.4	
Triumph Seed	TRXs9422	NS,SS	1975	--	--	45.8	71	114	48	2.5	12.5	29.2	17.4	
Triumph Seed	TRXs9423	NS,SS	1697	--	--	44.2	71	115	48	0.8	12.5	29.0	17.4	
Triumph Seed	TRXs9425	NS,SS	1776	--	--	45.2	70	115	43	1.3	13.0	29.1	17.4	
Triumph Seed	s680CL	NS,CL,SS	1831	--	--	45.5	70	114	44	2.1	12.1	29.9	17.4	
USDA (check)	894	Trad.	1983	1693	1838	44.8	64	103	62	2.0	12.7	28.9	15.7	
Grand Mean			2128	1800	1975	43.2	66	105	63	2.6	12.5	29.0	17.3	
LSD 5%			ns	389	282	2.0	1	3	4	4.0	1.0	1.0	ns	
C.V.			13.8	16.0	14.5	3.2	1.0	1.6	4.5	112.5	5.5	2.5	4.3	

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

<sup>2</sup>Hulling quality: Excel = >65% of seed passes over a 14/64 screen; Good = >75% of seed passes over a 13/64 screen.

Yield is reported at 10% moisture. Oil % is adjusted for oleic acid content.

Planted June 12, 2009. Harvested Nov. 9, 2009. Previous crop = wheat.

**Table 8. 2009 - Sunflower - Oilseed - Reliance, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield <sup>2</sup>			Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
			2009	2-yr Avg. (lb/a)	3-yr Avg. (lb/a)						
Croplan	306 DMR NS	NS,DM	2316	2331	--	43.6	61	1.9	12.3	29.1	14.8
Croplan	3080 DMR NS	NS,DM	1961	2168	--	46.5	66	3.1	11.6	29.5	14.9
Croplan	356A NS	NS	2175	--	--	45.1	63	2.3	12.0	29.2	14.0
Croplan	369 DMR NS	NS,DM	2394	2176	--	44.3	65	4.2	11.9	28.8	15.7
Croplan	378 DMR NS	NS,DM	2721	2416	--	43.9	70	3.7	12.2	29.2	15.7
Croplan	460 E NS	NS,Ex	1903	--	--	46.5	70	4.2	12.0	29.2	15.7
Croplan	555 CL DMR NS	NS,CL,DM	2105	--	--	42.1	72	2.3	11.7	28.6	15.7
King Seed	SunKing 4404 NSCL	NS,CL	2070	2228	2238	42.4	66	5.1	12.1	28.2	15.7
King Seed	SunKing 4444 NS	NS	1898	--	--	43.5	67	3.7	12.2	28.1	15.7
Syngenta	DKF34-33 NS/DM	NS,DM	1996	2250	1971	45.8	61	6.3	11.8	30.4	12.9
Syngenta	DKF34-80CL	NS,CL	2076	2251	2072	43.9	58	2.8	11.7	27.7	14.3
Syngenta	DKF37-31 NS	NS	2308	2694	2429	45.6	57	4.6	11.7	29.4	13.4
Syngenta	DKF37-32 NS	NS	2425	--	--	44.0	58	2.7	11.8	28.8	14.2
Syngenta	DKF38-45 HO	HO	2283	2449	2338	45.0	61	5.0	11.7	30.6	14.5
Syngenta	DKF38-75 NS	NS	1698	2313	2320	43.7	62	2.0	11.8	29.2	9.7
Syngenta	DKF39-80CL	NS,CL	2253	2264	--	43.6	72	4.2	12.0	29.0	15.7
Syngenta	IS7120 HO/DM	HO,DM	2068	2295	2136	43.1	62	2.3	11.8	29.6	15.7
Syngenta	MH9001CL	NS,CL	2215	--	--	43.3	66	3.3	12.6	29.4	15.3
Syngenta	MH9002CL	NS,CL	1932	--	--	42.5	69	2.3	12.0	31.3	15.7
Mycogen Seeds	8D310	NS	2618	--	--	39.9	68	3.7	12.0	29.3	15.7
Mycogen Seeds	8D481	NS	2282	2392	--	42.6	70	0.6	12.3	29.0	14.0
Mycogen Seeds	8H449DM	HO,DM	2069	2146	2035	46.7	68	3.2	11.7	29.5	15.7
Mycogen Seeds	8N187	NS	2237	2305	--	42.9	58	7.4	12.0	28.9	15.7
Mycogen Seeds	8N358CLDM	NS,CL,DM	2014	2104	2071	43.3	69	4.2	11.8	28.8	15.3
Mycogen Seeds	8N433DM	NS,DM	2186	--	--	45.0	65	2.8	11.7	29.6	15.5
Mycogen Seeds	8N453DM	NS,DM	2267	2415	2264	46.5	66	3.7	11.8	29.7	15.1
Mycogen Seeds	8N510	NS	2885	2886	2695	42.4	66	1.9	12.1	28.1	15.7
Pannar Seed	PAN7813 NS	NS	2661	2552	2394	42.7	64	5.4	12.3	29.0	15.6
Pannar Seed	PAN7924 NS	NS	2218	2376	2235	43.3	67	1.0	12.2	27.5	15.5
Pannar Seed	PAN8466 NS/CL	NS,CL	2169	--	--	42.3	66	5.0	12.4	27.9	13.2
Pannar Seed	PEX7803	HO	2522	--	--	45.1	56	5.0	12.1	29.6	15.7
Pannar Seed	PEX7904	HO	2084	--	--	44.2	61	3.6	12.1	28.9	14.4
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	1887	2042	--	44.5	69	7.0	12.1	29.0	15.1
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	2108	2341	--	44.0	64	1.4	12.0	30.9	15.3
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	2072	2165	--	43.7	70	1.2	12.1	31.5	14.8
Seeds 2000	Badger CL	NS,CL	2290	--	--	40.5	70	3.7	11.8	28.9	15.6
Seeds 2000	Barracuda	NS,CL	2163	2128	2029	44.0	66	4.9	12.7	29.4	15.1
Seeds 2000	Blazer CL	NS,CL	2026	1969	2016	42.7	67	4.8	12.4	28.2	11.6
Seeds 2000	Firebird	NS,Ex	2154	2350	2242	41.5	61	3.8	11.7	28.6	15.5
Seeds 2000	Sierra	HO	2021	2227	2149	43.0	64	5.6	11.9	26.1	14.8
Triumph Seed	s668	NS,SS	2622	--	--	46.4	50	0.5	12.0	29.7	15.7
Triumph Seed	s671	NS,SS	2282	2461	--	45.4	48	5.1	11.9	30.2	15.7
Triumph Seed	s674	NS,SS	1884	--	--	45.6	42	5.6	11.8	28.8	15.7
Triumph Seed	s678	NS,SS	2300	2443	2221	45.5	54	6.0	11.9	30.3	15.7
Triumph Seed	s878H	HO,SS	2602	2598	2398	46.5	54	4.6	12.0	31.3	15.7



**Table 8. 2009 - Sunflower - Oilseed - Reliance, S.D. (Continued)**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield <sup>2</sup>			Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
			2009	2-yr Avg. (lb/a)	3-yr Avg. (lb/a)						
Triumph Seed	s655	NS,SS,DM	2394	2742	--	46.1	42	2.8	11.8	30.0	15.7
Triumph Seed	TRXs9422	NS,SS	2648	--	--	46.8	40	2.8	11.8	29.8	15.1
Triumph Seed	TRXs9423	NS,SS	2298	--	--	46.2	48	4.8	12.0	29.4	16.9
Triumph Seed	TRXs9425	NS,SS	2244	--	--	47.0	43	3.2	11.9	29.4	15.7
Triumph Seed	s680CL	NS,CL,SS	1916	--	--	47.4	43	5.8	11.9	29.4	16.5
USDA (check)	894	Trad.	1891	1806	1870	45.9	61	0.9	11.5	30.0	15.7
USDA (check)	cms HA412/RHA 377	Trad.	1599	--	--	46.4	67	4.8	12.0	28.6	14.4
Grand Mean			2200	2321	2206	44.3	61	3.7	12.0	29.2	15.0
LSD 5%			466	302	234	1.6	4	ns	0.4	1.4	1.9
C.V.			15.2	13.4	13.1	2.6	5.1	100.4	2.3	3.4	9.2

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

<sup>2</sup>Three-year yield average is from 2009 Reliance, 2008 Reliance, and 2007 Presho, SD.

Yield is reported at 10% moisture. Oil % is adjusted for oleic acid content.

Planted June 17, 2009. Harvested November 12, 2009. Previous crop = wheat.

**Table 9. 2009 - Sunflower - Confection Hybrid - Miller, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed <sup>2</sup> Yield (lb/a)	Plant Height (inch)	Test Wt. (lb/bu)	Lodge (%)	Pop. x1000 Plt/a (plants)	Seed Over Screen			Nut-meat (%)
								22/64	20/64	18/64	
								-----(-)-----			
CHS Sunflower	RH 1121	Conf.		67	17.3	3.1	16.3	74	78	83	44.3
CHS Sunflower	RH 3126RT	Conf.		64	17.5	7.0	15.1	70	80	85	44.9
CHS Sunflower	RH 400CL	Conf./CL		53	17.6	6.3	15.6	80	88	92	45.5
Croplan Genetics	179	Conf.		61	17.7	2.1	16.1	79	87	91	43.8
Dahlgren & Co.	9579	Conf.		57	16.6	5.4	15.2	76	82	87	45.5
Dahlgren & Co.	9592	Conf.		65	17.4	2.4	16.5	85	88	91	46.7
Dahlgren & Co.	95EXCL	Conf./CL		65	17.4	5.1	14.9	84	87	88	47.7
Mycogen Seeds	8C451	Conf.		63	18.5	0.5	16.3	79	86	88	45.1
Red River Comm.	RRC 2215	Conf.		63	18.5	1.4	13.8	82	87	90	47.7
Red River Comm.	RRC 2216	Conf.		67	18.3	1.3	15.7	69	82	87	47.8
Red River Comm.	RRC 2217	Conf.		64	17.6	0.0	15.8	78	83	87	46.0
Seeds 2000	Jaguar	Conf./CL		60	18.1	2.1	16.1	79	88	91	47.3
Seeds 2000	Panther II	Conf.		60	19.0	3.3	15.6	76	86	88	45.5
Seeds 2000	X9681	Conf.		66	18.3	2.3	16.3	68	82	85	46.7
Triumph Seed	747C	Conf.		57	18.5	2.4	16.5	68	86	90	47.1
Triumph Seed	777C	Conf.		67	18.2	7.6	16.3	73	78	81	49.0
USDA	924 (check)	Conf.		68	18.9	4.5	16.1	63	69	74	48.0
Grand Mean				63	18.0	3.3	15.8	75	83	87	46.4
LSD 5%				4	ns	ns	ns	ns	11	ns	ns
C.V.				5.0	5.6	109	7.5	13.8	8.9	7.8	4.6

<sup>1</sup>Type: Conf. = Confection, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

Planted June 4, 2009. Harvested November 17, 2009.

<sup>2</sup>Seed yields not reported due to high C.V.

**Table 10. 2009 - Sunflower - Confection Hybrid - Onida, S.D.**

Brand	Hybrid	Hybrid Type <sup>1</sup>	Seed Yield (lb/a)	Days to		Plant Height (inch)	Test Wt. (lb/bu)	Lodge (%)	Pop. x1000 Plt/a (plants)	Seed Over Screen			Nut-meat (%)
				Flwr	Mat.					22/64	20/64	18/64	
				---(days)---		-----(%)------							
CHS Sunflower	RH 1121	Conf.	2306	68	112	72	21.5	4.2	17.4	78	90	93	46.0
CHS Sunflower	RH 3126RT	Conf.	1812	65	106	74	21.9	1.8	16.8	72	86	90	46.3
CHS Sunflower	RH 400CL	Conf./CL	2016	60	99	62	22.3	3.1	17.0	73	84	89	46.4
Croplan	179	Conf.	2398	68	117	73	22.0	0.8	17.4	81	88	91	46.3
Dahlgren	9579	Conf.	2017	65	108	61	20.5	1.7	17.0	80	93	95	45.7
Dahlgren	9592	Conf.	2120	65	107	74	22.3	2.1	16.8	83	96	98	54.8
Dahlgren	95EXCL	Conf./CL	2259	66	106	72	21.5	4.0	16.6	79	83	87	49.2
Mycogen Seeds	8C451	Conf.	2362	67	106	72	20.1	0.8	17.4	83	89	90	51.4
Red River Comm.	RRC 2215	Conf.	2699	64	103	73	21.1	2.5	16.8	78	86	89	48.1
Red River Comm.	RRC 2216	Conf.	2447	65	105	76	22.1	3.8	17.4	83	89	90	48.5
Red River Comm.	RRC 2217	Conf.	2066	66	108	72	19.7	3.2	16.3	81	89	91	49.0
Seeds 2000	Jaguar	Conf./CL	2162	60	101	71	21.8	6.3	17.4	72	87	90	47.9
Seeds 2000	Panther II	Conf.	2298	63	104	70	23.2	7.5	17.4	73	87	90	47.9
Seeds 2000	X9681	Conf.	2309	66	109	76	19.7	1.9	14.6	83	86	89	46.2
USDA (check)	924	Conf.	1801	65	103	76	23.1	5.3	16.3	34	51	64	53.0
Grand Mean			2205	65	106	72	21.5	3.3	16.8	75	86	89	48.4
LSD 5%			393	1	4	4	ns	ns	ns	12	9	8	5.6
C.V.			12.5	1.3	2.3	4.1	9.3	93.2	8.2	11.3	7.6	6.5	8.1

<sup>1</sup>Type: Conf. = Confection, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature. Planted June 12, 2009. Harvested November 10, 2009.

**Table 11. 2009 - Sunflower - Oilseed - Averages across three locations (Eureka, Onida, and Reliance, S.D.).**

Brand	Hybrid	Hybrid Type <sup>1</sup>	2009 Seed Yield (lb/a)	Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
Croplan	306 DMR NS	NS,DM	2100	43.5	61	1.3	13.2	28.2	17.5
Croplan	3080 DMR NS	NS,DM	2229	46.1	62	3.2	12.1	28.4	19.5
Croplan	356A NS	NS	2391	44.2	61	1.5	13.6	28.8	17.1
Croplan	369 DMR NS	NS,DM	2342	44.2	65	2.4	13.4	28.2	18.8
Croplan	378 DMR NS	NS,DM	2722	44.2	69	2.3	14.6	28.2	18.3
Croplan	460 E NS	NS,Ex	2136	45.5	67	2.6	13.7	28.6	18.3
Croplan	555 CL DMR NS	NS,CL,DM	2161	43.2	69	1.5	13.5	28.0	19.3
King Seed	SunKing 4404 NSCL	NS,CL	2139	43.3	67	4.9	13.4	27.8	19.8
King Seed	SunKing 4444 NS	NS	2333	43.6	65	4.8	13.8	27.4	18.8
Syngenta	DKF34-33 NS/DM	NS,DM	2203	45.6	62	4.4	12.6	29.9	17.0
Syngenta	DKF34-80CL	NS,CL	2095	44.7	62	2.0	12.4	27.7	18.0
Syngenta	DKF37-31 NS	NS	2273	45.5	60	2.8	13.2	29.2	18.4
Syngenta	DKF37-32 NS	NS	2393	44.4	60	1.8	13.3	29.1	19.5
Syngenta	DKF38-45 HO	HO	2304	45.2	60	2.5	13.4	29.9	18.5
Syngenta	DKF38-75 NS	NS	2045	44.1	63	6.6	14.0	28.2	15.7
Syngenta	DKF39-80CL	NS,CL	2147	43.4	74	3.7	13.8	28.1	17.6
Syngenta	IS7120 HO/DM	HO,DM	2007	44.4	61	2.1	13.1	28.1	20.1
Syngenta	MH9001CL	NS,CL	2257	44.5	67	1.9	15.2	28.8	20.5
Syngenta	MH9002CL	NS,CL	2215	43.0	69	1.5	13.9	30.4	19.6
Mycogen Seeds	8D310	NS	2497	41.3	66	1.9	13.7	28.6	18.9
Mycogen Seeds	8D481	NS	2268	43.7	69	1.2	13.8	28.7	18.9
Mycogen Seeds	8H449DM	HO,DM	2248	46.6	67	1.4	14.2	29.2	19.2
Mycogen Seeds	8N187	NS	2223	43.8	57	3.6	12.5	28.2	18.6
Mycogen Seeds	8N358CLDM	NS,CL,DM	2022	45.3	66	2.8	13.1	28.6	19.9
Mycogen Seeds	8N433DM	NS,DM	2342	45.4	65	2.3	13.0	28.2	18.9
Mycogen Seeds	8N453DM	NS,DM	2240	46.0	66	2.4	13.6	29.3	18.8
Mycogen Seeds	8N510	NS	2560	43.4	66	2.0	13.3	27.5	19.4
Pannar Seed	PAN7813 NS	NS	2417	43.5	63	3.2	14.5	28.3	19.5
Pannar Seed	PAN7924 NS	NS	2347	43.8	67	2.7	14.3	27.7	19.1
Pannar Seed	PAN8466 NS/CL	NS,CL	1999	43.2	68	5.4	13.6	27.6	17.8
Pannar Seed	PEX7803	HO	2402	44.8	58	5.0	14.3	28.8	19.5
Pannar Seed	PEX7904	HO	2198	44.7	61	3.1	14.6	28.6	18.3
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	1890	44.8	67	2.9	13.2	28.4	18.5
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	2276	44.6	65	1.0	14.2	29.6	19.2
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	2211	44.4	69	1.5	14.3	29.9	19.4
Seeds 2000	Badger CL	NS,CL	2283	40.9	70	3.2	13.2	28.0	18.5
Seeds 2000	Barracuda	NS,CL	2321	43.6	63	2.2	15.2	28.3	17.0
Seeds 2000	Blazer CL	NS,CL	2184	43.1	68	4.2	13.9	27.3	17.8
Seeds 2000	Firebird	NS,Ex	2107	42.8	61	2.8	14.1	27.9	17.8
Seeds 2000	Sierra	HO	1928	42.9	63	6.5	13.0	26.3	19.0
Triumph Seed	s671	NS,SS	2209	46.0	48	2.6	13.8	29.4	18.2
Triumph Seed	s674	NS,SS	2173	46.5	44	3.0	13.6	28.6	20.3
Triumph Seed	s678	NS,SS	2382	46.0	52	2.9	14.4	29.7	19.8
Triumph Seed	s878H	HO,SS	2526	45.6	55	2.2	13.9	29.6	18.8
Triumph Seed	s655	NS,SS,DM	2256	45.5	41	1.6	13.4	29.1	19.5
Triumph Seed	TRXs9422	NS,SS	2331	46.6	43	2.2	13.9	28.9	18.5
Triumph Seed	TRXs9423	NS,SS	2177	45.8	46	2.8	14.1	28.5	17.7
Triumph Seed	s680CL	NS,CL,SS	2195	46.9	43	3.7	13.8	29.3	18.3
USDA (check)	894	Trad.	2039	46.3	58	1.4	13.8	28.7	18.0
Grand Mean			2229	44.5	62	2.8	13.7	28.6	18.7
LSD 5%			282	1.1	3	2.5	0.6	0.8	2.0
C.V.			15.7	3.0	5.3	112.8	5.9	3.3	13.5

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

Yield is reported at 10% moisture. Oil % is adjusted for oleic acid content.

**Table 12. 2009 - Sunflower - Oilseed - Averages across four locations (Bison, Eureka, Onida, and Reliance, S.D.).**

Brand	Hybrid	Hybrid Type <sup>1</sup>	2009 Seed Yield (lb/a)	Oil Cont. (%)	Plant Height (inch)	Lodge (%)	Harv. Moist. (%)	Test Wt. (lb/bu)	Pop. x1000 Plt/a (plants)
Croplan	306 DMR NS	NS,DM	1811	44.1	59	2.6	11.0	28.3	17.3
Croplan	3080 DMR NS	NS,DM	1929	46.7	59	5.3	10.6	28.7	19.2
Croplan	356A NS	NS	2021	44.6	58	1.5	11.6	28.8	17.3
Croplan	369 DMR NS	NS,DM	1960	44.3	62	2.9	11.8	27.9	18.1
Croplan	378 DMR NS	NS,DM	2291	44.1	65	2.5	14.2	28.6	18.2
Croplan	460 E NS	NS,Ex	1762	45.6	63	3.4	12.8	28.7	18.2
Croplan	555 CL DMR NS	NS,CL,DM	1799	44.1	65	2.4	11.9	27.6	18.8
King Seed	SunKing 4404 NSCL	NS,CL	1812	43.5	62	3.9	11.9	28.2	19.3
King Seed	SunKing 4444 NS	NS	1970	43.3	62	4.4	12.8	27.8	18.0
Syngenta	DKF34-33 NS/DM	NS,DM	1819	45.8	59	4.9	11.0	31.0	16.8
Syngenta	DKF34-80CL	NS,CL	1725	44.9	59	4.2	10.6	28.5	17.8
Syngenta	DKF37-31 NS	NS	1904	45.4	57	4.4	11.8	29.4	18.0
Syngenta	DKF37-32 NS	NS	2000	44.4	57	3.3	11.8	29.6	18.9
Syngenta	DKF38-45 HO	HO	1946	45.8	57	2.6	12.2	30.3	18.1
Syngenta	DKF38-75 NS	NS	1741	43.8	59	6.7	12.5	28.2	15.7
Syngenta	DKF39-80CL	NS,CL	1771	43.8	69	4.1	12.3	28.3	17.2
Syngenta	IS7120 HO/DM	HO,DM	1760	44.5	58	3.0	11.2	28.9	19.4
Syngenta	MH9001CL	NS,CL	1898	44.7	63	2.9	14.4	28.9	19.5
Syngenta	MH9002CL	NS,CL	1857	43.4	64	2.1	12.4	30.2	19.2
Mycogen Seeds	8H449DM	HO,DM	2010	47.1	64	1.3	13.4	29.7	18.9
Mycogen Seeds	8N187	NS	1899	43.9	55	3.6	11.1	28.9	18.3
Mycogen Seeds	8N358CLDM	NS,CL,DM	1781	45.3	61	4.7	11.7	29.5	19.1
Mycogen Seeds	8N433DM	NS,DM	2012	45.8	61	3.9	11.7	28.0	18.6
Mycogen Seeds	8N510	NS	2236	43.9	62	1.5	12.3	27.3	19.1
Pioneer Hi-Bred	Pioneer Brand 63M91	NS	1575	44.9	63	2.6	12.7	29.2	18.2
Pioneer Hi-Bred	Pioneer Brand 63N82	NS,Ex	1953	44.7	61	0.8	13.2	29.9	18.9
Pioneer Hi-Bred	Pioneer Brand 64H41	HO	1843	44.6	65	2.7	13.3	29.8	18.8
Triumph Seed	s671	NS,SS	1953	45.8	45	2.8	12.3	29.0	18.2
Triumph Seed	s674	NS,SS	1955	46.5	43	2.4	12.5	28.3	19.8
Triumph Seed	s678	NS,SS	2058	45.8	51	2.9	12.8	29.2	19.1
Triumph Seed	s655	NS,SS,DM	1919	45.5	39	1.5	12.1	29.5	19.1
Triumph Seed	TRXs9422	NS,SS	1930	46.3	42	2.0	12.3	27.9	18.3
Triumph Seed	s680CL	NS,CL,SS	1866	46.4	41	3.5	12.7	29.4	18.1
USDA (check)	894	Trad.	1684	46.6	55	1.6	12.8	29.3	17.5
Grand Mean			1896	45.0	58	3.1	12.2	28.9	18.4
LSD 5%			229	0.9	2	2.5	0.6	0.7	1.6
C.V.			16.7	3.0	5.5	114.2	7.4	3.6	12.1

<sup>1</sup>Type: HO = High Oleic, NS = NuSun, Trad = Traditional, CL = Clearfield, Ex= ExpressSun, DM = Downy Mildew Resistant, SS=Short Stature.

Yield is reported at 10% moisture. Oil % is adjusted for oleic acid content.