

Sunflower Hybrid Tests in Tennessee

2004 - 2007

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Variety test results are posted on UT's website at:

**<http://varietytrials.tennessee.edu/>
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www.utcrops.com**

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2004 - 2007 PERFORMANCE OF SUNFLOWER HYBRIDS IN TENNESSEE RESEARCH AND EDUCATION CENTER TESTS

Experimental Procedures:

The sunflower hybrid trials were conducted in two of the physiographic regions of the state. The trial was conducted at the East Tennessee, Knoxville and Milan Research and Education Centers (REC). The trial contained 15 (2004), 17 (2005), 25 (2006), and 31 (2007) hybrids at each location. The tests were fertilized with 90 pounds of nitrogen per acre. A portion of the nitrogen was applied prior to seeding and the remainder was applied as a side-dress. The plot size was two rows, 30 feet in length with 30 inch row spacing. Plots were replicated three times at each location in a randomized complete block design. Plots were seeded at the rate of approximately 25,000 seed per acre. Table 1 contains the test location information on planting and harvest dates and soil types. Tables 2 and 3 contain the **Research and Education Center Test** data for 2007. Tables 4 and 5 contain the two-year data, Tables 6 and 7 contain the three-year data, Tables 8 and 9 contain the four-year data summaries. Tables 10 and 11 contains the data for 2006. Tables 12 and 13 contains the data for 2005. Tables 14 and 15 contains the data for 2004. Table 16 contains the phenotypic trait data for the sunflower hybrids tested over the four year period. The contact information for sunflower seed companies is listed in Table 17.

Interpretation of Data:

The tables on the following pages have been prepared with the entries listed in order of performance, the highest-yielding entry being listed first. **All yields presented have been adjusted to 10% moisture.** At the bottom of the tables, **LSD** values stand for **Least Significant Difference**. The mean yields of any two varieties being compared must differ by at least the amount shown in order to be considered different in yielding ability at the 5% level of probability of significance. For example, given that the LSD for a test is 450 lbs/a and the mean yield of Hybrid A was 1700 lbs/a and the mean yield of Hybrid B was 1300 lbs/a, then the two hybrids are not statistically different in yield because the difference of 400 lbs/a is less than the minimum of 450 lbs/a required for them to be significant. Similarly, if the average yield of Hybrid C was 2200 lbs/a then it is significantly higher yielding than both Hybrid B and Hybrid A, because the difference between B and C (900 lbs) and the difference between A and C (500 lbs) exceeds the LSD value of 450 lbs.

Also, the **coefficient of variation (C.V.)** values are shown at the bottom of each table. This value is a measure of the error variability found within each experiment. It is the percentage that the square root of error mean square is of the overall test mean yield at that location. For example, a C.V. of 10% indicates that the size of the error variation is about 10% of the size of the test mean. Similarly, a C.V. of 30% indicates that the size of the error variation is nearly one-third as large as the test mean. A goal in conducting each yield test is to keep the C.V. as low as possible, preferably below 20%.

Growing Seasons: The 2007 growing season was one characterized by extremes. A late frost and very low temperatures in the first portion of April caused wheat and corn crop damage. The remainder of the season was characterized by record setting heat and drought which lowered yields. Daytime temperatures were high (several 100+ F days) during flowering and seed fill periods at both locations. The Knoxville location experienced fairly severe drought and high temperatures for most of the growing season.

The 2006 season was characterized by hot, dry conditions through most of the growing period. Daytime temperatures were high (several 90+ F days) during flowering and seed fill periods at both locations.

The 2005 season was characterized by several timely rainfall events during critical parts of the growing season. Rainfall events were prompted by hurricane aftermaths (especially Dennis, Katrina, and Rita) passing through the state. Daytime temperatures were high (several 90+ F days) during flowering and seed fill periods at both locations.

The 2004 season was characterized by very favorable temperatures and rainfall for seed production. Adequate amounts and very timely distribution of rain, as well as lower than normal day and night temperatures, resulted in an exceptionally good growing season.

Table 1. Location information from Research and Education Centers where the sunflower hybrid tests were conducted in 2004, 2005, 2006, and 2007.

Reserch & Education Center	Location	Planting Date	Harvest Date	Plant Population	Soil Type
2007					
Knoxville	Knoxville	May 8, 2007	September 6, 2007	25,000	Stasser Silt Loam
Milan	Milan	May 8, 2007	August 29, 2007	25,000	Grenada, Henry Silt Loam
Milan (Double Crop)	Milan	June 15, 2007	October 10, 2007	25,000	Grenada, Henry Silt Loam
2006					
Knoxville	Knoxville	May 9, 2006	August 21, 2006	19,000	Sequatchie Silt Loam
Milan	Milan	May 19, 2006	August 28, 2006	25,000	Grenada, Henry Silt Loam
Milan (Double Crop)	Milan	June 7, 2006	October 3, 2006	25,000	Grenada, Henry Silt Loam
2005					
Knoxville	Knoxville	May 12, 2005	August 26, 2005	25,000	Sequatchie Silt Loam
Milan	Milan	May 20, 2005	September 6, 2005	25,000	Falaya Silt Loam
2004					
Knoxville	Knoxville	May 21, 2004	August 31, 2004	25,000	Sequatchie Silt Loam
Milan	Milan	May 20, 2004	September 13, 2004	25,000	Loring, Henry Silt Loam

Table 2. Mean yields of 31 sunflower hybrids evaluated in three environments in Tennessee during 2007.

Brand	Hybrid	Avg. Yield†	Knoxville §	Milan	Double Crop Milan	Avg. Yield†
		± Std. Err. (n=3)				± Std. Err. (n=3)
		----- lbs/a -----				bu/a
Triumph	777 C ‡	993 ± 80	636	1956	387	40 ± 3
Croplan	356 NS	962 ± 73	729	1722	433	38 ± 3
Triumph	636	944 ± 95	345	1998	489	38 ± 4
Pioneer	63M80	934 ± 72	298	2037	468	37 ± 3
Mycogen	8N453	930 ± 72	669	1871	251	37 ± 3
Triumph	847HO CL	925 ± 79	227	2130	419	37 ± 3
Triumph	855HO	925 ± 79	354	2250	171	37 ± 3
Triumph	645	911 ± 72	401	1798	533	36 ± 3
Dekalb	DKF 37-31	900 ± 78	519	1774	406	36 ± 3
Triumph	660 CL	885 ± 79	588	1711	356	35 ± 3
Dekalb	DKF 35-10NS	866 ± 73	642	1632	323	35 ± 3
Mycogen	8N520DM	849 ± 78	374	1739	435	34 ± 3
Croplan	378 DMR HO	829 ± 73	306	1762	419	33 ± 3
Mycogen	8N386CL	827 ± 73	334	1787	359	33 ± 3
Pioneer	63M91	826 ± 78	184	2099	196	33 ± 3
Dekalb	DKF 38-30	826 ± 73	312	1937	229	33 ± 3
Mycogen	8N462DM	819 ± 73	634	1680	142	33 ± 3
Mycogen	8H419CL	816 ± 79	355	1740	351	33 ± 3
Triumph	s678	814 ± 74	331	1744	368	33 ± 3
Pioneer	64H41	807 ± 72	204	1908	311	32 ± 3
Triumph	845HO	743 ± 72	324	1518	388	30 ± 3
Triumph	859HO CL	728 ± 100	394	1634	156	29 ± 4
Dekalb	DKF 39-01	712 ± 79	285	1642	210	28 ± 3
Mycogen	8D310	668 ± 73	334	1203	468	27 ± 3
Pioneer	63A70	666 ± 100	359	1363	275	27 ± 4
Triumph	665	650 ± 80	232	1535	181	26 ± 3
Triumph	620 CL	631 ± 95	236	1623	35	25 ± 4
Mycogen	8N270	574 ± 73	512	969	242	23 ± 3
Dekalb	DKF 38-80 CL	564 ± 78	204	1334	154	23 ± 3
Croplan	3080 DMR NS	513 ± 78	290	1020	230	21 ± 3
Mycogen	8N337DM	479 ± 72	391	964	82	19 ± 3
Avg.		829	387	1682	329	33
L.S.D.._{.05}		199	269	449	285	8
C.V. (%)		24.6	42.2	15.8	44.1	24.6

† All yields adjusted to 10% moisture

‡ Confectionary Type

§ Severe heat and drought at Knoxville during the growing season.

lbs / ac ÷ 25 = bushels per acre

Table 3. Mean yields and agronomic characteristics of 31 sunflower hybrids evaluated in three environments in Tennessee during 2007.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=3) lbs/a	Avg. Yield† ± Std. Err. (n=3) bu/a	Moisture at Harvest (n=1) %	Test Weight (n=3) lbs/bu	Oil (n=3) %	Head Diameter (n=1) in.	Plant Height (n=3) in.	Lodging (n=3) score	Bird Damage (n=1) %
Triumph	777 C ‡	993 ± 80	40 ± 3	7.4	20.2	29.2	5.2	54	2.4	1.3
Croplan	356 NS	962 ± 73	38 ± 3	7.8	30.3	42.3	5.0	43	1.2	1.8
Triumph	636	944 ± 95	38 ± 4	7.4	28.1	43.2	4.8	50	2.1	2.5
Pioneer	63M80	934 ± 72	37 ± 3	7.7	30.0	42.4	5.3	47	1.3	2.8
Mycogen	8N453	930 ± 72	37 ± 3	7.7	27.3	44.6	4.7	48	1.3	2.8
Triumph	847HO CL	925 ± 79	37 ± 3	7.4	28.1	43.4	4.3	52	2.2	2.7
Triumph	855HO	925 ± 79	37 ± 3	7.7	24.7	43.8	4.7	54	2.4	2.2
Triumph	645	911 ± 72	36 ± 3	7.6	30.6	44.6	4.2	49	1.9	2.0
Dekalb	DKF 37-31	900 ± 78	36 ± 3	7.9	30.1	42.2	5.0	46	1.5	2.0
Triumph	660 CL	885 ± 79	35 ± 3	7.8	25.5	41.7	4.3	47	1.3	3.2
Dekalb	DKF 35-10NS	866 ± 73	35 ± 3	7.8	29.1	40.1	5.2	49	1.4	2.0
Mycogen	8N520DM	849 ± 78	34 ± 3	7.4	27.3	42.5	4.3	45	1.4	2.7
Croplan	378 DMR HO	829 ± 73	33 ± 3	8.0	30.9	43.3	5.5	50	1.4	3.0
Mycogen	8N386CL	827 ± 73	33 ± 3	7.5	27.5	42.8	3.7	48	1.4	2.5
Pioneer	63M91	826 ± 78	33 ± 3	8.1	28.1	43.8	4.7	49	1.3	2.5
Dekalb	DKF 38-30	826 ± 73	33 ± 3	7.9	31.4	41.4	4.8	46	1.3	2.8
Mycogen	8N462DM	819 ± 73	33 ± 3	7.7	30.1	44.3	5.0	46	1.4	3.3
Mycogen	8H419CL	816 ± 79	33 ± 3	7.4	24.9	42.7	4.2	46	1.3	2.7
Triumph	s678	814 ± 74	33 ± 3	7.4	30.3	44.2	4.0	43	2.1	2.7
Pioneer	64H41	807 ± 72	32 ± 3	7.6	30.5	42.6	4.0	47	1.3	3.0
Triumph	845HO	743 ± 72	30 ± 3	7.3	26.7	44.4	4.0	45	2.4	2.0
Triumph	859HO CL	728 ± 100	29 ± 4	8.2	22.6	41.0	4.8	40	1.2	3.5
Dekalb	DKF 39-01	712 ± 79	28 ± 3	7.5	30.0	42.3	4.2	45	1.4	2.8
Mycogen	8D310	668 ± 73	27 ± 3	7.5	24.7	38.9	4.2	50	1.3	1.7
Pioneer	63A70	666 ± 100	27 ± 4	7.3	27.1	44.2	5.5	45	1.4	2.7
Triumph	665	650 ± 80	26 ± 3	7.4	29.7	43.6	4.2	47	2.0	2.3
Triumph	620 CL	631 ± 95	25 ± 4	7.4	27.1	42.2	3.3	47	1.7	2.8
Mycogen	8N270	574 ± 73	23 ± 3	7.6	30.4	41.1	4.5	38	1.9	2.5
Dekalb	DKF 38-80 CL	564 ± 78	23 ± 3	7.5	26.9	40.1	4.3	42	1.2	3.0
Croplan	3080 DMR NS	513 ± 78	21 ± 3	7.6	24.3	42.6	4.3	42	1.2	3.0
Mycogen	8N337DM	479 ± 72	19 ± 3	7.8	24.7	41.2	4.7	44	1.4	2.2
Average		829	33	7.6	27.7	42.1	4.5	47	1.6	2.5

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

‡ Confectionary Type

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95%+ of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

Table 4. Mean yields of 21 sunflower hybrids evaluated in three environments for two years (2006-2007) in Tennessee.

Brand	Hybrid	Avg. Yield†	Double			Avg. Yield†
		± Std. Err. (n=6)	Knoxville	Milan	Crop Milan	± Std. Err. (n=6)
		----- lbs/a -----				bu/a
Mycogen	8N453	1279 ± 87	1488	1355	994	51 ± 3
Triumph	636	1223 ± 103	1351	1495	824	49 ± 4
Dekalb	DKF 39-01	1200 ± 92	1544	1398	659	48 ± 4
Triumph	s678	1194 ± 92	1043	1599	938	48 ± 4
Triumph	777 C ‡	1193 ± 92	923	1539	1116	48 ± 4
Triumph	645	1158 ± 87	1194	1572	708	46 ± 3
Mycogen	8N386CL	1112 ± 91	818	1736	782	44 ± 4
Dekalb	DKF 35-10NS	1092 ± 88	932	1280	1064	44 ± 4
Triumph	845HO	1088 ± 91	737	1684	842	44 ± 4
Mycogen	8H419CL	1075 ± 92	863	1552	810	43 ± 4
Mycogen	8N462DM	1058 ± 88	847	1512	815	42 ± 4
Dekalb	DKF 38-30	1030 ± 91	774	1539	778	41 ± 4
Mycogen	8D310	1028 ± 88	900	1230	955	41 ± 4
Mycogen	8N270	1026 ± 88	1120	1131	829	41 ± 4
Triumph	660 CL	962 ± 91	714	1317	856	38 ± 4
Dekalb	DKF 37-31	960 ± 94	848	1265	768	38 ± 4
Dekalb	DKF 38-80 CL	940 ± 91	851	1280	688	38 ± 4
Mycogen	8N520DM	934 ± 91	688	1251	861	37 ± 4
Triumph	620 CL	910 ± 106	649	1424	659	36 ± 4
Mycogen	8N337DM	780 ± 88	691	1084	566	31 ± 4
Triumph	665	780 ± 92	555	1107	678	31 ± 4
Avg.		1049	930	1398	818	42
L.S.D._{.05}		290	595	508	380	12
C.V. (%)		33.9	50.4	24.1	30.5	33.9

† All yields adjusted to 10% moisture

‡ Confectionary Type

lbs / ac ÷ 25 = bushels per acre

Table 5. Mean yields and agronomic characteristics of 21 sunflower hybrids evaluated in three environments for two years (2006-2006) in Tennessee.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=6) lbs/a	Avg. Yield† ± Std. Err. (n=6) bu/a	Moisture at Harvest (n=4) %	Test Weight (n=6) lbs/bu	Head Diameter (n=2) in.	Plant Height (n=6) in.	Lodging (n=6) score	Bird Damage (n=2) %
Mycogen	8N453	1279 ± 87	51 ± 3	9.5	28.0	5.5	54	1.2	2.3
Triumph	636	1223 ± 103	49 ± 4	10.7	26.7	5.3	55	1.8	2.0
Dekalb	DKF 39-01	1200 ± 92	48 ± 4	9.5	27.8	5.2	51	1.4	2.1
Triumph	s678	1194 ± 92	48 ± 4	9.3	28.1	4.8	47	1.6	2.1
Triumph	777 C ‡	1193 ± 92	48 ± 4	10.1	18.1	5.2	59	1.8	1.5
Triumph	645	1158 ± 87	46 ± 3	9.8	27.6	4.6	55	1.8	1.8
Mycogen	8N386CL	1112 ± 91	44 ± 4	9.0	26.6	4.7	55	1.3	1.9
Dekalb	DKF 35-10NS	1092 ± 88	44 ± 4	10.4	27.8	4.8	54	1.4	1.8
Triumph	845HO	1088 ± 91	44 ± 4	9.5	25.2	4.5	53	1.8	1.8
Mycogen	8H419CL	1075 ± 92	43 ± 4	8.7	25.4	4.7	54	1.2	2.3
Mycogen	8N462DM	1058 ± 88	42 ± 4	10.1	28.7	5.1	52	1.3	2.8
Dekalb	DKF 38-30	1030 ± 91	41 ± 4	9.5	28.9	5.0	53	1.4	2.3
Mycogen	8D310	1028 ± 88	41 ± 4	8.7	23.7	4.4	53	1.2	1.6
Mycogen	8N270	1026 ± 88	41 ± 4	10.0	28.6	5.1	47	1.6	2.1
Triumph	660 CL	962 ± 91	38 ± 4	11.2	25.0	4.6	53	1.3	2.5
Dekalb	DKF 37-31	960 ± 94	38 ± 4	9.3	27.5	4.8	50	1.4	1.8
Dekalb	DKF 38-80 CL	940 ± 91	38 ± 4	10.0	26.0	4.7	46	1.3	2.3
Mycogen	8N520DM	934 ± 91	37 ± 4	9.3	26.5	4.8	52	1.3	2.3
Triumph	620 CL	910 ± 106	36 ± 4	8.6	26.8	4.0	53	1.6	2.4
Mycogen	8N337DM	780 ± 88	31 ± 4	8.8	25.5	4.5	51	1.5	2.1
Triumph	665	780 ± 92	31 ± 4	8.6	27.8	4.9	51	1.9	1.9
Average		1049	42	9.5	26.5	4.8	52	1.5	2.1

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95+% of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

‡ Confectionary Type

Table 6. Mean yields of nine sunflower hybrids evaluated in two environments for three years (2005-2007) in Tennessee.

Brand	Hybrid	Avg. Yield† ± Std. Err.		Milan	Avg. Yield† ± Std. Err.
		(n=6)	Knoxville		(n=6)
		----- lbs/a -----			bu/a
Triumph	636	1532 ± 95	1651	1413	61 ± 4
Triumph	645	1384 ± 96	1322	1446	55 ± 4
Dekalb	DKF 35-10NS	1262 ± 95	1208	1316	50 ± 4
Dekalb	DKF 38-30	1256 ± 99	1013	1498	50 ± 4
Triumph	777 C ‡	1237 ± 95	1188	1286	49 ± 4
Dekalb	DKF 37-31	1228 ± 99	1225	1231	49 ± 4
Dekalb	DKF 38-80 CL	1086 ± 96	1033	1138	43 ± 4
Triumph	620 CL	1075 ± 99	735	1416	43 ± 4
Triumph	660 CL	988 ± 96	692	1284	40 ± 4
Avg.		1228	1119	1337	49
L.S.D..05		379	612	455	15
C.V. (%)		32.5	44.5	22.9	32.5

Table 7. Mean yields and agronomic characteristics of nine sunflower hybrids evaluated in two environments for three years (2005-2007) in Tennessee.

Brand	Hybrid	Avg. Yield	Avg. Yield†	Moisture	Test	Head	Plant	Lodging	Bird
		± Std. Err. (n=6)	± Std. Err. (n=6)	at Harvest (n=5)	Weight (n=5)	Diameter (n=3)	Height (n=6)	(n=6)	Damage (n=3)
		lbs/a	bu/a	%	lbs/bu	in.	in.	score	%
Triumph	636	1532 ± 95	61 ± 4	9.8	26.0	5.6	58	2.1	2.0
Triumph	645	1384 ± 96	55 ± 4	9.1	25.9	4.8	61	2.1	2.3
Dekalb	DKF 35-10NS	1262 ± 95	50 ± 4	9.7	27.2	4.8	58	1.6	2.1
Dekalb	DKF 38-30	1256 ± 99	50 ± 4	8.9	27.7	4.7	58	1.6	2.6
Triumph	777 C ‡	1237 ± 95	49 ± 4	10.1	16.8	5.3	67	2.2	1.5
Dekalb	DKF 37-31	1228 ± 99	49 ± 4	8.7	26.9	4.9	55	1.6	2.0
Dekalb	DKF 38-80 CL	1086 ± 96	43 ± 4	9.4	25.1	4.8	52	1.9	2.2
Triumph	620 CL	1075 ± 99	43 ± 4	8.3	27.3	4.1	58	2.1	2.9
Triumph	660 CL	988 ± 96	40 ± 4	10.5	25.1	4.5	59	1.9	3.0
Average		1228	49	9.4	25.3	4.9	58	1.9	2.3

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

‡ Confectionary Type

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95+% of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

Table 8. Mean yields of six sunflower hybrids evaluated in two environments for four years (2004-2007) in Tennessee.

Brand	Hybrid	Avg. Yield† ± Std. Err.		Avg. Yield† ± Std. Err.	
		(n=8)	Knoxville Milan	(n=8)	(n=8)
		----- lbs/a -----		bu/a	
Triumph	636	1637 ± 90	1770	1504	65 ± 4
Triumph	645	1346 ± 90	1353	1338	54 ± 4
Dekalb	DKF 38-30	1237 ± 83	1084	1390	49 ± 3
Dekalb	DKF 35-10NS	1227 ± 90	1356	1097	49 ± 4
Dekalb	DKF 38-80 CL	1193 ± 90	1089	1297	48 ± 4
Triumph	620 CL	1139 ± 85	931	1346	46 ± 3
Avg.		1296	1264	1329	52
L.S.D._{.05}		368	602	437	15
C.V. (%)		31.6	42.0	22.9	31.6

† All yields adjusted to 10% moisture

lbs / ac ÷ 25 = bushels per acre

Table 9. Mean yields and agronomic characteristics of six sunflower hybrids evaluated in two environments for four years (2004-2007) in Tennessee.

Brand	Hybrid	Avg. Yield	Avg. Yield†	Moisture	Test	Head	Plant	Lodging	Bird
		± Std. Err.	± Std. Err.	at Harvest	Weight	Diameter	Height		
		(n=8)	(n=8)	(n=6)	(n=7)	(n=5)	(n=8)	(n=8)	(n=4)
		lbs/a	bu/a	%	lbs/bu	in.	in.	score	%
Triumph	636	1637 ± 90	65 ± 4	9.7	26.6	6.3	62	2.4	2.0
Triumph	645	1346 ± 90	54 ± 4	9.2	26.8	5.5	63	2.6	2.3
Dekalb	DKF 38-30	1237 ± 83	49 ± 3	9.2	29.1	5.3	61	1.8	2.9
Dekalb	DKF 35-10NS	1227 ± 90	49 ± 4	9.7	28.7	5.1	61	2.2	2.0
Dekalb	DKF 38-80 CL	1193 ± 90	48 ± 4	9.4	26.0	5.5	54	2.1	2.1
Triumph	620 CL	1139 ± 85	46 ± 3	8.5	28.6	4.9	61	2.3	2.8
Average		1296	52	9.3	27.6	5.4	60	2.2	2.3

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95%+ of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

Table 10. Mean yields of 25 sunflower hybrids evaluated in three environments in Tennessee during 2006.

Brand	Hybrid	Avg. Yield†			Double	Avg. Yield†
		± Std. Err.	Knoxville	Milan	Crop	± Std. Err.
		(n=3)	lbs/a		Milan	(n=3)
						bu/a
Dekalb	DKF 39-01	1688 ± 160	2803	1154	1108	68 ± 6
Mycogen	8N453	1628 ± 160	2307	840	1736	65 ± 6
Triumph	s678	1573 ± 173	1756	1454	1509	63 ± 7
Triumph	636	1502 ± 159	2357	992	1158	60 ± 6
Mycogen	8N270	1478 ± 159	1727	1293	1415	59 ± 6
Triumph	845HO	1432 ± 173	1150	1850	1297	57 ± 7
Triumph	645	1405 ± 159	1987	1346	883	56 ± 6
Mycogen	8N386CL	1397 ± 172	1302	1685	1204	56 ± 7
Triumph	777 C ‡	1392 ± 159	1210	1122	1845	56 ± 6
Mycogen	8D310	1389 ± 160	1467	1257	1442	56 ± 6
Mycogen	8N419CL	1334 ± 159	1370	1365	1269	53 ± 6
Dekalb	DKF 35-10NS	1318 ± 160	1222	928	1804	53 ± 6
Dekalb	DKF 38-80 CL	1316 ± 160	1498	1226	1223	53 ± 6
Mycogen	8N462DM	1298 ± 159	1060	1345	1489	52 ± 6
Triumph	658	1290 ± 160	1230	1189	1453	52 ± 6
Mycogen	8H350DM	1265 ± 185	1125	1290	1379	51 ± 7
Dekalb	DKF 38-30	1235 ± 173	1237	1141	1327	49 ± 7
Triumph	620 CL	1189 ± 173	1061	1225	1282	48 ± 7
Mycogen	8N337DM	1082 ± 160	992	1203	1050	43 ± 6
Triumph	660 CL	1039 ± 159	840	922	1355	42 ± 6
Triumph	TRX S5322CL	1037 ± 173	1078	1207	826	41 ± 7
Dekalb	DKF 37-31	1021 ± 173	1177	756	1130	41 ± 7
Mycogen	8N520DM	1018 ± 160	1001	763	1288	41 ± 6
Triumph	s672	976 ± 159	971	787	1170	39 ± 6
Triumph	665	910 ± 159	877	679	1174	36 ± 6
Avg.		1289	1409	1164	1290	52
L.S.D.._{.05}		442	1027	755	504	18
C.V. (%)		35.9	43.1	37.3	23.8	35.9

† All yields adjusted to 10% moisture

‡ Confectionary Type

lbs / ac ÷ 25 = bushels per acre

Table 11. Mean yields and agronomic characteristics of 25 sunflower hybrids evaluated in three environments in Tennessee during 2006.

Brand	Hybrid	Avg. Yield	Avg. Yield†	Moisture	Test	Head	Plant	Lodging	Bird
		± Std. Err. (n=3)	± Std. Err. (n=3)	at Harvest (n=1)	Weight (n=3)	Diameter (n=1)	Height (n=3)		Damage (n=1)
		lbs/a	bu/a	%	lbs/bu	in.	in.	score	%
Dekalb	DKF 39-01	1688 ± 160	68 ± 6	15.4	25.5	6.3	57	1.4	1.3
Mycogen	8N453	1628 ± 160	65 ± 6	14.7	28.6	6.3	61	1.2	1.7
Triumph	s678	1573 ± 173	63 ± 7	17.9	25.7	5.5	51	1.2	1.5
Triumph	636	1502 ± 159	60 ± 6	18.4	25.2	5.7	59	1.6	1.5
Mycogen	8N270	1478 ± 159	59 ± 6	17.2	26.7	5.7	55	1.3	1.7
Triumph	845HO	1432 ± 173	57 ± 7	19.5	23.2	4.9	60	1.3	1.5
Triumph	645	1405 ± 159	56 ± 6	16.3	24.1	5.0	62	1.7	1.5
Mycogen	8N386CL	1397 ± 172	56 ± 7	13.3	25.8	5.8	62	1.1	1.3
Triumph	777 C ‡	1392 ± 159	56 ± 6	18.2	16.2	5.2	64	1.1	1.7
Mycogen	8D310	1389 ± 160	56 ± 6	12.2	22.3	4.6	56	1.1	1.5
Mycogen	8N419CL	1334 ± 159	53 ± 6	12.6	25.9	5.2	62	1.0	2.0
Dekalb	DKF 35-10NS	1318 ± 160	53 ± 6	17.9	26.4	4.4	59	1.3	1.5
Dekalb	DKF 38-80 CL	1316 ± 160	53 ± 6	17.2	25.2	5.0	51	1.3	1.5
Mycogen	8N462DM	1298 ± 159	52 ± 6	17.1	27.2	5.3	58	1.1	2.2
Triumph	658	1290 ± 160	52 ± 6	16.2	24.5	5.3	61	1.8	1.3
Mycogen	8H350DM	1265 ± 185	51 ± 7	10.9	25.0	5.0	58	1.2	1.5
Dekalb	DKF 38-30	1235 ± 173	49 ± 7	14.2	26.2	5.1	60	1.5	1.7
Triumph	620 CL	1189 ± 173	48 ± 7	14.1	26.3	4.6	59	1.4	2.0
Mycogen	8N337DM	1082 ± 160	43 ± 6	11.7	26.3	4.3	57	1.6	2.0
Triumph	660 CL	1039 ± 159	42 ± 6	21.3	24.5	4.8	58	1.2	1.8
Triumph	TRX S5322CL	1037 ± 173	41 ± 7	16.2	24.2	4.6	46	1.6	1.5
Dekalb	DKF 37-31	1021 ± 173	41 ± 7	14.7	24.4	4.5	54	1.3	1.5
Mycogen	8N520DM	1018 ± 160	41 ± 6	15.0	25.4	5.2	58	1.2	1.8
Triumph	s672	976 ± 159	39 ± 6	12.9	26.2	4.6	45	1.2	1.5
Triumph	665	910 ± 159	36 ± 6	12.2	25.5	5.6	55	1.7	1.5
Average		1289	52	15.5	25.1	5.1	57	1.3	1.6

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95%+ of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

‡ Confectionary Type

Table 12. Mean yields of 17 sunflower hybrids evaluated in two environments in Tennessee during 2005.

Brand	Hybrid	Avg. Yield†			Avg. Yield†
		± Std. Err. (n=2)	Knoxville	Milan	± Std. Err. (n=2)
		----- lbs/a -----			bu/a
Triumph	636	1750 ± 163	2250	1250	70 ± 7
Dekalb	DKF 35-10	1575 ± 162	1761	1389	63 ± 6
Dekalb	MH 4331 B	1571 ± 163	1980	1162	63 ± 7
Mycogen	SF270	1557 ± 162	1601	1512	62 ± 6
Triumph	658	1539 ± 164	1559	1519	62 ± 7
Mycogen	8N429 CL	1482 ± 162	1964	999	59 ± 6
Mycogen	8N352	1475 ± 163	1568	1381	59 ± 7
Dekalb	DKF 38-30	1454 ± 162	1492	1417	58 ± 6
Advanta Pacific	444 NS/CL	1428 ± 162	1458	1399	57 ± 6
Triumph	645	1387 ± 163	1580	1195	55 ± 7
Triumph	777 C ‡	1249 ± 162	1717	781	50 ± 6
Triumph	620 CL	1153 ± 162	907	1399	46 ± 6
Dekalb	DKF 38-80 CL	1126 ± 164	1396	855	45 ± 7
Triumph	s672	1117 ± 164	996	1239	45 ± 7
Mycogen	8N251	1074 ± 161	1392	755	43 ± 6
Advanta Pacific	461 NS	1057 ± 164	908	1206	42 ± 7
Triumph	660 CL	934 ± 163	649	1219	37 ± 7
Avg.		1344	1473	1215	54
L.S.D._{.05}		440	830	341	18
C.V. (%)		28.3	33.8	16.8	28.3

† All yields adjusted to 10% moisture

‡ Confectionary Type

lbs / ac ÷ 25 = bushels per acre

Table 13. Mean yields and agronomic characteristics of 17 sunflower hybrids evaluated in two environments in Tennessee during 2005.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=2) lbs/a	Avg. Yield† ± Std. Err. (n=2) bu/a	Moisture at Harvest (n=2) %	Test Weight (n=1) lbs/bu	Head Diameter (n=1) in.	Plant Height (n=2) in.	Lodging (n=2) score	Bird Damage (n=1) %
Triumph	636	1750 ± 163	70 ± 7	7.8	23.6	6.3	70	3.2	2.0
Dekalb	DKF 35-10	1575 ± 162	63 ± 6	7.7	25.3	4.9	68	2.4	2.8
Dekalb	MH 4331 B	1571 ± 163	63 ± 7	7.6	25.4	5.3	67	2.6	2.5
Mycogen	SF270	1557 ± 162	62 ± 6	7.4	26.2	5.0	69	3.0	3.0
Triumph	658	1539 ± 164	62 ± 7	7.8	23.2	5.0	69	3.4	3.5
Mycogen	8N429 CL	1482 ± 162	59 ± 6	7.5	24.7	4.9	72	3.0	2.3
Mycogen	8N352	1475 ± 163	59 ± 7	7.4	26.9	4.7	66	3.3	4.0
Dekalb	DKF 38-30	1454 ± 162	58 ± 6	7.6	25.3	4.2	68	2.3	3.3
Advanta Pacific	444 NS/CL	1428 ± 162	57 ± 6	7.4	24.5	4.8	69	2.5	1.5
Triumph	645	1387 ± 163	55 ± 7	7.3	22.8	5.3	72	3.8	3.5
Triumph	777 C ‡	1249 ± 162	50 ± 6	8.9	16.0	5.5	79	3.6	1.5
Triumph	620 CL	1153 ± 162	46 ± 6	7.4	26.6	4.5	65	3.2	4.0
Dekalb	DKF 38-80 CL	1126 ± 164	45 ± 7	7.5	24.1	5.1	63	3.2	2.0
Triumph	s672	1117 ± 164	45 ± 7	7.4	26.8	4.5	50	2.1	3.2
Mycogen	8N251	1074 ± 161	43 ± 6	7.4	23.0	4.8	60	2.8	1.8
Advanta Pacific	461 NS	1057 ± 164	42 ± 7	7.6	23.0	4.1	64	2.2	2.3
Triumph	660 CL	934 ± 163	37 ± 7	8.1	23.5	4.4	68	3.5	4.0
Average		1344	54	7.6	24.2	4.9	67	2.9	2.8

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95%+ of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

‡ Confectionary Type

Table 14. Mean yields of 15 sunflower hybrids evaluated in two environments in Tennessee during 2004.

Brand	Hybrid	Avg. Yield†		Avg. Yield†	
		± Std. Err. (n=2)	Knoxville	Milan	± Std. Err. (n=2)
		----- lbs/a -----		bu/a	
Triumph	636	1953 ± 198 ‡	---	1776	78 ± 8 ‡
Mycogen	8N429 CL	1624 ± 137	1520	1729	65 ± 5
Monsanto	DKF 38-80 CL	1514 ± 198 ‡	---	1772	61 ± 8 ‡
Monsanto	MH 4231	1430 ± 154	2222	639	57 ± 6
Interstate	HySun 450	1376 ± 137	1440	1313	55 ± 5
Triumph	620 CL	1329 ± 155	1520	1138	53 ± 6
Triumph	645	1240 ± 198 ‡	---	1015	50 ± 8 ‡
Mycogen	8N251	1245 ± 137	1116	1373	50 ± 5
Interstate	4880 NS/CL	1184 ± 137	1175	1192	47 ± 5
Monsanto	DKF 38-30	1180 ± 137	1296	1063	47 ± 5
Monsanto	Exp 35-10	1119 ± 198	1801	438	45 ± 8
Triumph	667	1091 ± 137	1743	438	44 ± 5
Triumph	TRX 2446	1014 ± 154	1057	971	41 ± 6
Mycogen	8N352	933 ± 155	536	1331	37 ± 6
Mycogen	SF270	801 ± 155	706	897	32 ± 6
Avg.		1267	1410	1154	51
L.S.D..₀₅		428	944	444	17
C.V. (%)		26.5	30.4	22.2	26.5

† All yields adjusted to 10% moisture

lbs / ac ÷ 25 = bushels per acre

‡ Average was calculated with best linear unbiased estimates from missing data at the Knoxville location

Table 15. Overall mean yields and agronomic characteristics of 15 sunflower hybrids evaluated in two environments in Tennessee during 2004.

Brand	Hybrid	Avg. Yield	Avg. Yield†	Moisture	Test	Head	Plant	Lodging	Bird
		± Std. Err. (n=2)	± Std. Err. (n=2)	at Harvest (n=1)	Weight (n=2)	Diameter (n=2)	Height (n=2)		Damage (n=1)
		lbs/a	bu/a	%	lbs/bu	in.	in.	score	%
Triumph	636	1953 ± 198 ‡	78 ± 8 ‡	9.3	29.8	7.3	72	3.1	---
Mycogen	8N429 CL	1624 ± 137	65 ± 5	9.2	30.3	6.4	68	2.3	1.5
Monsanto	DKF 38-80 CL	1514 ± 198 ‡	61 ± 8 ‡	9.5	30.5	6.5	59	2.8	---
Monsanto	MH 4231	1430 ± 154	57 ± 6	11.2	31.3	5.9	65	2.3	1.5
Interstate	HySun 450	1376 ± 137	55 ± 5	9.6	31.5	6.3	66	2.0	2.0
Triumph	620 CL	1329 ± 155	53 ± 6	9.6	31.8	6.1	69	3.1	2.0
Triumph	645	1240 ± 198 ‡	50 ± 8 ‡	9.3	31.2	6.6	70	3.8	---
Mycogen	8N251	1245 ± 137	50 ± 5	9.5	33.4	6.1	66	2.5	3.0
Interstate	4880 NS/CL	1184 ± 137	47 ± 5	9.2	32.3	6.7	69	2.4	1.5
Monsanto	DKF 38-30	1180 ± 137	47 ± 5	10.5	32.3	6.3	68	2.5	3.5
Monsanto	Exp 35-10	1119 ± 198	45 ± 8	9.6	33.9	5.5	69	4.1	1.5
Triumph	667	1091 ± 137	44 ± 5	9.5	32.8	5.9	51	2.7	2.5
Triumph	TRX 2446	1014 ± 154	41 ± 6	10.0	32.9	5.7	48	1.8	4.0
Mycogen	8N352	933 ± 155	37 ± 6	9.7	33.5	6.2	66	2.4	2.0
Mycogen	SF270	801 ± 155	32 ± 6	9.4	33.2	5.8	70	3.1	3.0
Average		1267	51	9.7	32.0	6.2	65	2.7	2.3

† All yields adjusted to 10% moisture

Bushel weight sunflower equals 25 lbs.

Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

Bird Damage = 1 to 5 scale; where 1 = 95%+ of plant seed remaining; 2.5 = ~50% of plant seed eaten; 5 = 95+% of plant seed eaten.

‡ Average was calculated with best linear unbiased estimates from missing data at the Knoxville location

Table 16. Characteristics of sunflower hybrids evaluated in yield tests in Tennessee during 2004 - 2007.†

Brand	Hybrid	Herbicide Tolerance	Released or Experimental	Comments
Advanta Pacific	444 NS/CL	---	R	---
Advanta Pacific	461 NS	---	R	---
Croplan	3080 DMR NS	---	R	Early, good disease tolerance, excellent oil
Croplan	356 NS	---	R	High yield, lacks disease tolerance
Croplan	378 DMR HO	---	R	High yield, large seed size
Dekalb	DKF 35-10NS	---	R	---
Dekalb	DKF 37-31	---	R	---
Dekalb	DKF 38-30	---	R	---
Dekalb	DKF 38-80 CL	CL	R	---
Dekalb	DKF 39-01	---	R	---
Interstate	4880 NS/CL	CL	R	---
Interstate	HySun 450	---	R	---
Monsanto	MH 4231	---	R	---
Mycogen	8D310	---	R	---
Mycogen	8H350DM	---	R	---
Mycogen	8H419CL	CL	R	---
Mycogen	8N251	---	R	---
Mycogen	8N270	---	R	---
Mycogen	8N337DM	---	R	---
Mycogen	8N352	---	R	---
Mycogen	8N386CL	CL	R	---
Mycogen	8N429 CL	CL	R	---
Mycogen	8N453	---	R	---
Mycogen	8N462DM	---	R	---
Mycogen	8N520DM	---	R	---
Mycogen	SF270	---	R	---
Pioneer	63A70	---	R	---
Pioneer	63M80	---	R	---
Pioneer	63M91	---	R	---
Pioneer	64H41	---	R	---
Triumph	636	---	R	---
Triumph	645	---	R	---
Triumph	658	---	R	---
Triumph	665	---	R	---
Triumph	667	---	R	---
Triumph	620 CL	CL	R	---
Triumph	660 CL	CL	R	---
Triumph	777 C	---	R	Confectionary Type
Triumph	845HO	---	R	High oleic
Triumph	847HO CL	CL	R	High oleic
Triumph	855HO	---	R	High oleic
Triumph	859HO CL	CL	R	High oleic
Triumph	s672	---	R	Short
Triumph	s678	---	R	Short
Triumph	TRX 2446	---	E	---
Triumph	TRX S5322CL	CL	E	Short

CL = contains a gene for tolerance to Imidazolinone class herbicides

† Information on this table provided by the respective seed companies.

Table 17. Contact information for sunflower seed companies evaluated in yield tests in Tennessee during 2004 - 2007

Company	Contact	Phone	Email	Web site	Address
Advanta Pacific		701-373-8115		www.pacificseeds.com	1215 Prairie Pkwy, West Fargo, ND 58078
Croplan Genetics/Land o Lakes	Will Huckon John Patterson	931-231-6791 931-273-3590		www.croplangenetics.com	Ethridge, TN Manchester, TN
Monsanto (Dekalb, Interstate)		800-335-2676		www.asgrow.com	
Mycogen Seed		800-692-6436		www.dowagro.com/mycogen	
Pioneer Hi-Bred Int.	Michael Hughes	800-331-2475	michael.hughes@pioneer.com	www.pioneer.com	700 Boulevard South, Suite 302, Huntsville, AL 35802
Triumph Seed Co. Inc.	Ben Benton	800-530-4789	ben@triumphseed.com	www.triumphseed.com	P.O. Box 1050, Ralls, TX 79357