AGRONOMIC AND TEST INFORMATION:

Special Note: This report may not be reliable for assessing differences among individual hybrids due to trial factors noted below. Please use caution interpreting trial results. See discussion for details.

TEST:	**2009 Irrigated Oilseed Sunflower Performance Test**
LOCATION:	Texas AgriLife Research Halfway Station, **Halfway, Texas** (Hale County, 10 miles west of Plainview)
COOPERATORS:	Dr. Calvin Trostle, Extension agronomist; Sean Wallace, Extension assistant
SOIL TYPE:	Olton clay loam
ROW WIDTH:	40”
PREVIOUS CROP:	Fallow
LAND PREPARATION:	Disk, rolling cultivator (for listing)
DATE PLANTED:	6/9/09 with cones mounted on a JD Max-Emerge planter
SEEDS PER ACRE:	Seeds dropped at 2.0 seeds per foot of 40” row (26,000 seed/A), and all doubles thinned to 1 plant
PLANTS PER ACRE:	Population for actual plant stand was calculated for the harvest area; trial average 17,600 plants per acre
PLOT LENGTH:	4 rows X 25’
FERTILIZER:	100 N—30 P_2O_5—0 K_2O, applied with coulter rig ~3 weeks after seeding
HERBICIDE:	Trifluralin, 0.75 qts./A
INSECTICIDE:	~3.8 oz. pyrethroid (Asana) 7/31 and 8/6 by airplane (2^{nd} application also included a light rate of Lorsban)
FUNGICIDE:	Due to apparent failure of first head moth spray, significant sunflower head moth larvae were present particularly in earlier blooming plots. Two applications of Botran 75-W (2.3 lbs./A) 7 days apart (Sept. 2 & 9) were applied by 4-row backpack sprayer in an attempt to minimize fungal development.
RAINFALL:	June, 6.5”; July, 2.2”, August, 0.5”, Sept. 1.0”; Seasonal total, 10.2”.
IRRIGATIONS:	Three row waterings, ~4.5” each
DATE HARVESTED:	10/15-16/09
SIZE HARVESTED PLOT:	2 middle rows X 22’
TEST DESIGN:	Randomized complete block
NUMBER ENTRIES:	28
NUMBER REPLICATIONS:	4
NUMBER ROWS/PLOT:	4
TEST MEANS:	1,274 lbs./A; yield corrected to 10% moisture; average oil content 42.4%
TEST C.V.:	26.1% (see note in the discussion explaining high CV)
SISTER TRIAL SITES?:	Hybrids were tested at the North Plains Research Field, Etter, Moore Co., replanted 7/8/2009 (see results at http://varietytesting.tamu.edu).

COMMENTS:

This trial achieved a good stand and was hoed as needed after plants became too tall to cultivate to reduce pigweed. The first aerial sunflower head moth spray was scheduled for August 1 just after initial bloom of 1 to 8% for 7 of 28 hybrids recorded the morning of July 31. Actual spraying with pyrethroid occurred that evening, July 31, and the test was sprayed a second time six days later with pyrethroid (also mixed with light rate of Lorsban) on August 6th. By ~August 20th it became readily apparent that sunflower moth larvae were present on most heads, particularly those hybrids that had bloomed earlier. Hybrids that were not yet in bloom Aug. 3 or especially until Aug. 5 the day before the second spray was made had much less head moth larval activity or webbing on the heads. Notable correlations found that average percent bloom (Aug. 5) vs. yield was r = -0.47 (higher bloom, lower yield), and average percent bloom (Aug. 5) vs. %oil was r = -0.54. Field notes in particular had noted good head size on short stature Triumph s674 and s680CL with mostly clean heads. These two hybrids were at 30% and 2% bloom on Aug. 5, the day before the second spray.

Thus this scenario appears to have significantly favored most sunflower hybrids that bloomed a couple days later than other trial hybrids. In this case little egg lay occurred on later blooming heads. The result is a wide range of yields. We estimate that the failed sunflower head moth spray may have reduced yields up to 500 lbs./A for some hybrids. Hybrids with half bloom ≤56 days averaged 1,160 lbs./A, but hybrids with half bloom of 57-58 days averaged 1,405 lbs./A. Also, earlier blooming hybrids averaged 2.5 lbs./bu lower test weight and 3.1% lower oil content. Botran (Gowan, Inc.) was applied twice in early September in an attempt to retard potential *Rhizopus* fungal development.

The test was harvested by hand, and then threshed through a stationary thresher after seed samples had dried considerably. A clipper machine was used to clean trash from all samples.

Yield averaged 1,274 lbs./A (PLSD of 217 lbs./A) and an average crop value of $245/A was calculated using $19/cwt for high oleic, and $18/cwt. for NuSun, which was reflected in 2009 regional crop prices. A 2-for-1 oil premium (discount) was included. Due to the high coefficient of variation, %CV = 26.1, this data is not reliable for significant conclusions on hybrid yield differentials. Much of this uncertainty from a statistical point of view, however, is because there was a large range of yield (means from 824 to 1,869 lbs./A), and when yields are low (e.g., compared to a trial yielding over 2,000 lbs./A or irrigated grain trials where yields are 5,000 lbs./A and more) this artificially inflates %CV. In fact, at a 95% confidence level, the Fisher's Protected Least Significant Difference (PLSD) was only 217 lbs./A.

The accompanying table notes the performance of NuSun vs. high oleic hybrids as a group, and in this test NuSun yielded 222 lbs./A higher and also had slightly higher oil content. Short stature hybrids (mostly < 3.5' tall), ranging in height from 3.3' to 4.3' yielded substantially better than taller hybrids and had 4% higher oil content vs. the trial average. Two examples of these hybrids were noted above.

For biodiesel purposes, the average hybrid (545 lbs. oil per acre) would have yielded 69 gallons of oil per acre at extraction efficiency of 95%.

For further information about this test, contact Dr. Calvin Trostle, Extension agronomy, Lubbock, (806) 746-6101, ctrostle@ag.tamu.edu
For further information about the Texas AgriLife Research Crop Testing Program, contact Mr. Dennis Pietsch, Crop Testing Director, Texas AgriLife Research, College Station, TX, (979) 845-8505, croptest@neo.tamu.edu
Please visit the Crop Testing webpage at http://varietytesting.tamu.edu
For further sunflower production resources for Texas visit our sunflower page at http://lubbock.tamu.edu/sunflower

Special Note: This report may not be reliable for assessing differences among individual hybrids due to trial factors noted below. Please use caution interpreting trial results. See discussion for details.

AgriLIFE EXTENSION Texas A&M System

2009 Irrigated Oilseed Sunflower Hybrid Test
Halfway, Hale Co., Texas

AgriLIFE RESEARCH Texas A&M System

OILSEED, 2009											
Company or Brand	Hybrid	Oil Type†	Height (feet)	Avg. Plants/ acre	Days to Half Bloom	Avg. Lodg-ing	Test Weight (lbs./bu)	% Oil Content at 10% H2O	Seed Yld ,@ 10% H2O (lbs./A)	Oil Yield/ acre (lbs./A)	Crop Value ($/acre)‡
Advanta	AP461NS	Nu	4.8	17,900	57	3	29.6	42.3	1,386	586	261
Advanta	AP 462NS	Nu	5.3	16,100	57	3	29.2	43.4	1,346	584	259
Advanta	F30294 NS, Rust	Nu	5.8	20,100	58	1	31.3	41.4	1,869	773	345
Advanta	F30008NS,CL	Nu, CL	4.3	18,700	56	2	28.5	42.7	1,355	580	258
Croplan	CG 343DMR HO	HO	4.9	19,100	55	1	27.8	37.6	1,379	521	250
Croplan	CG 356A NS	Nu	4.5	19,900	55	2	26.9	39.8	1,326	528	238
Croplan	CG 369 DMR NS	Nu	5.4	18,100	55	2	25.9	40.5	1,157	470	211
Croplan	CG 378DMR NS	Nu	5.3	17,700	57	5	28.9	42.8	1,111	477	212
Croplan	CG 378 DMR HO	HO	5.4	18,300	57	3	26.9	41.1	925	382	180
Croplan	CG 460E NS	Nu,Ex	5.4	16,800	58	3	28.7	43.2	965	418	185
Croplan	CG 555CL DMR NS	Nu	5.6	17,900	56	3	28.1	39.8	1,014	406	183
Monsanto	DKF 37-31 NS	Nu	4.3	18,100	55	2	25.3	37.6	1,077	406	185
Monsanto	DKF 37-32 NS	Nu	4.1	18,800	56	2	26.4	40.4	1,255	509	228
Monsanto	DKF 38-45 HO	HO	4.2	16,200	54	5	26.8	41.6	846	349	165
Mycogen	8N358CLDM	Nu,CL	4.9	18,300	56	2	26.7	41.6	1,014	424	189
Mycogen	8N453DM	Nu	5.2	18,600	56	2	29.7	43.6	1,333	585	259
Mycogen	8H449DM	HO	5.1	16,800	56	1	30.8	44.5	1,297	577	269
Mycogen	8N510	Nu	4.4	20,000	56	1	27.7	40.3	1,352	550	247
Pioneer	64H41	HO	5.1	19,100	55	3	30.1	39.1	988	385	184
Pioneer	63M91	Nu	5.0	18,000	55	2	29.9	43.1	1,188	511	227
Check	(Pioneer 63N82)	Nu,Ex	5.1	16,400	57	5	30.1	42.1	905	381	170
Triumph	657	Nu	5.9	15,200	57	4	27.9	44.8	1,644	740	326
Triumph	664	Nu	5.2	15,100	57	2	32.2	45.6	1,722	785	345
Triumph	845HO	HO	5.4	15,700	56	4	24.4	43.0	824	355	166
Triumph	s671	Nu,SS	3.4	16,700	57	0	32.4	46.2	1,509	697	305
Triumph	s674	Nu,SS	3.3	15,900	58	0	31.5	45.9	1,619	744	326
Triumph	s680CL	Nu,SS,CL	3.3	18,000	58	1	31.6	48.5	1,769	858	373
Triumph	s878HO	HO,SS	4.3	15,400	57	0	32.3	45.8	1,490	682	316
		Overall average	*4.8*	*17,600*	*56*	*2*	*28.8*	*42.4*	*1,274*	*545*	*245*

OILSEED, 2009											
Company or Brand	Hybrid	Oil Type†	Height (feet)	Avg. Plants/ acre	Days to Half Bloom	Avg. Lodg-ing	Test Weight (lbs./bu)	% Oil Content at 10% H2O	Seed Yld ,@ 10% H2O (lbs./A)	Oil Yield/ acre (lbs./A)	Crop Value ($/acre)‡
P-Value			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Fisher's Protected Least Signif. Diff. (0.05)¶			0.5	2,600	1.1	2	1.6	2.3	217	106	47
Coefficient of Variation (%CV)			16.1	12.4	2.2	89	8.5	7.2	26.1	30.6	29.1

Hybrid Type Comparisons

NuSun average			2	29.0	42.6	1,329	572	254
High oleic average			3	28.4	41.8	1,107	465	219
Short stature average			0	32.0	46.6	1,597	745	330
Clearfield average			1	28.9	44.3	1,379	621	273

Sunflower head moth effect on sunflower based on bloom date (first spray failed)

Half-bloom date, ≤56 days			2.2	27.7	41.0	1,160	477	217
Half-bloom date, 57-58 days			2.3	30.2	44.1	1,405	624	277

†Oilseed types: NS = NuSun oil, HO = high oleic oil, SS = short stature oil, CL = Clearfield herbicide tolerant, Ex = ExpressSun herbicide tolerant
‡Oilseed--2:1 premium/discount vs. 40% oil: TX High Plains 2009 contract market, NS @ $18.00/cwt, HO @ $19.00/cwt.
¶Numbers in the same column that vary by more than the least significant difference are significantly different at a 95% confidence level.

Planted June 9, 2009; harvested October 15-16, 2009
~26,000 seeds/A (2.0 seeds/ft. on 40" rows), all doubles thinned to 1 plant

Rainfall, June-Sept., 10.2"; Furrow irrigation, ~13.5"
Fertilizer, 100N-30P2O5-0K per acre, 3 weeks after planting.

Trial Notes: Field observations and data suggest the first aerial sunflower head moth spray on July 31 failed (7 of 28 hybrids ranged in bloom from 1 to 8%). By ~August 20th sunflower moth larvae were present on most heads, particularly earlier blooming hybrids. Hybrids that were not yet in bloom Aug. 3 or especially until Aug. 5 had much less head moth larval activity or webbing. Thus this scenario appears to have significantly favored most sunflower hybrids that bloomed a couple days later than other trial hybrids.

Although yield PLSD was low at 217 lbs./A, the high CV (26.1%) suggests great variability in the data and that this data set may not reliably separate hybrids. However, the %CV is artificially high because of the range of yields (824 to 1,869 lbs./A), and %CV is always more pronounced at numerically low yields. See the accompanying text report for further discussion.

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