



SAFFLOWER VARIETY EVALUATION

NUECES COUNTY, 2009

Cooperator: Texas AgriLife Research & Extension Center

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SUMMARY:

This test was located on the Research & Extension Center on Hwy 44. Rainfall during the growing season was very limited, thus yields were depressed. Yields ranged from a low of 211 pounds per acre to a high of 1,315 pounds per acre.

OBJECTIVE:

To evaluate winter and spring safflower varieties for yield and production in South Texas and determine the economics of producing these crops and potential risks associated with production.

MATERIALS and METHODS:

Safflower was planted on November 19, and 24, 2008, at Clarkwood on the Texas AgriLife Research & Extension Center in a randomized complete replicated block with three replications. The soil at seeding depth was moist and a Tye Pasture Drill placed seed in 8-inch rows. Soil test indicated a pH of 8.2 with a fertilizer recommendation of 55-40-0 for 2,000 canola yield potential. This was used since a canola test was also planted in the same field. Fertilizer of 56-38-16 was applied on November 18, 2008 and incorporated. Treflan @ 1 qt/ac was incorporated on November 18, 2008.

Both spring and winter type safflower varieties were evaluated in this test. The spring types in this test included; Calwest 99-0L, Calwest 88-0L, S-345, S-334, and 5200. The winter types included; PI-38903 and PI-405985. Rainfall recorded during the growing season was as follows; November = 0.17, December = 0.29, January = 0.06, February = 0.08, March = 0.64, April = 0.08, and May = 1.44 for a total of 2.76 inches. The safflower varieties were hand harvested with the harvest size being approximately 1/1000 of an acre. Only one replication of PI-38903 was harvested as other two reps lacked adequate stand for harvest due to drought and poor emergence. Samples were thrashed in a portable thrashing machine, weighed, and moisture and bushel weight were determined.

Table 1: Agronomic data for Safflower Variety Demonstration, AgriLife Research & Extension Center Nueces County, Texas, 2008-2009.

Planting Date: November 19, 24, 2008	Plot Size: 16' x 25' replicated	Row Width: 8 inch
Fertility: 11/18 56-38-16	Soil Type: Clareville loam	Previous Crop: Canola
Planting Rate: 25 lbs./acre	Herbicide: Treflan @ 1 qt/A	Harvest: May 19, June 1

RESULTS and DISCUSSION:

A field evaluation on February 13, 2009 noted that plant height of winter safflower was up to 6-inches while the spring safflower had plant heights up to 26-inches. Harvest of safflower usually occurs when most of the leaves have turned brown and the flower bracts show only a green tint. Seed should have a moisture content of 8 percent or less for safe storage. Harvest of the spring safflower occurred on May 19 while the winter safflower was harvested on June 1.

Table 2. Comparison of percent moisture, bushel weight, rust rating, and yield per acre from hand harvest, of safflower variety test, AgriLife Research & Extension Center, Nueces County, Texas, 2009.

Safflower Variety	(%) Moisture	Bu Wt. ² (Lbs.)	Rust ³	Yield ¹ (lbs./acre)
S-345	9.43 abc	33	1.0 bc	907 a
Calwest 99-0L	11.03 a	32	1.7 bc	884 a
S-334	8.57 bc	36	1.0 bc	695 ab
PI-405985 (winter)	9.80 ab	NA	4.0 a	575 abc
Calwest 88-0L	10.86 a	33	2.0 b	315 bc
5200	7.67 c	NA	0.7 c	211 c
Mean	9.56		1.7	598
LSD (P=0.10)	1.79		1.07	428
P>F	0.0445		0.0022	0.0663
Standard deviation	1.2129		0.72	289.6
CV	12.69		41.96	48.43

¹Yield is adjusted to 10% moisture. ²Bushel weight was measured combining all replications. ³Rust rating is visual observation on May 13, 2009 on a scale of 0 to 5, with 5 meaning there was excessive rust present on leaves. Means followed by same letter do not significantly differ (P=.01, LSD)

Since PI-38903 only had one viable replication to harvest, statistics on yield data was not evaluated and thus not included in Table 2. However, data was measured from one plot as follows (1,315 lbs/acre with 35 lb Bu weight @ 12.5% moisture and rust score of 3.7).

Table 3. Comparison of plant population, plant height, seed germination, and gross value, safflower variety test, AgriLife Research & Extension Center, Nueces County, Texas, 2009.

Safflower Variety	Plant Population/Ac	Plant Ht (inches)	Seed Germ (%)	Yield (lbs./acre)	Gross Value/Ac ¹
S-345	104,548	24	50	907	\$157.36
Calwest 99-0L	123,866	30	38	884	\$153.37
S-334	161,241	24	54	695	\$120.58
PI-405985 (winter)	146,433	34	82	575	\$99.76
Calwest 88-0L	121,223	23	66	315	\$54.65
5200	110,006	24	60	211	\$36.61
PI-388903 (winter)**	178,782	38	60	1,315	\$228.15
Average	119,585	28	59	700	\$121.50

¹Price = \$17.35/cwt or the most recent 4 year price average. ** Only one plot was evaluated due to poor stand.

Note the variability in plant population and this can be attributed to the very dry conditions at and following planting, thus poor plant emergence. Seed viability was evaluated and for each variety. 50 seeds were evaluated and surface-disinfested in 10% bleach for 2 minutes, followed by two sterile water washes. They were plated on water agar with streptomycin and incubated 5 days. From this germination was determined as indicated in Table 3. No pathogens were detected by this method although low viability was noted, which is a concern if this crop is for seed.

Today there is renewed interest in safflower seed for its oil and food use. Before the 1960's in the U.S., the oil was used mostly as a base for paints, and is still used for that today. However, it is also being used in infant formulas, cosmetics, and salad and cooking oils. Safflower meal is about 24 percent protein and high in fiber and is used as a protein supplement for livestock and poultry feed. Whole safflower seeds are used in the birdseed industry.

Safflower is a deep tap rooted plant that can draw nutrients from depths of 6 to 8 feet, however, unless you have good soil moisture at planting in the seed bed, this advantage of a deep tap root will not be realized as was observed in this test in some plots.

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