A Final Report to Cargill Specialty Oils Concerning

Evaluations of Canola Varieties for Production in South Texas

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Dr. Steve Livingston
Professor and Extension Agronomist
Texas Cooperative Extension
Corpus Christi, Texas

Participants of the 2005 Cargill Specialty Oils Project Team

Dr. Steve Livingston - Project Coordinator
Professor and Extension Agronomist
Texas A&M Research and Extension Center
10345 Agnes
Corpus Christi, Texas 78406-1412
Bus 361-265-9203
FAX 361-265-9434
e-mail: sd-livingston@tamu.edu

Jerry L. Cass
Seed Production Manager
Cargill Specialty Canola Oils
2300 N. Yellowstone Hwy. Suite 122
Idaho Falls, ID 83401
Bus 208-227-9085
FAX 208-522-0794
e-mail: jerry_cass@cargill.com

Roy D. Parker
Professor and Extension Entomologist
Texas A&M Research and Extension Center
10345 Agnes
Corpus Christi, Texas 78406-1412
Bus 361-265-9203
FAX 361-265-9434
e-mail: Rparker@ag.tamu.edu

Larry Falconer
Professor and Agricultural Economist
Texas A&M Research and Extension Center
10345 Agnes
Corpus Christi, Texas 78406-1412
Bus 361-265-9203
FAX 361-265-9434
e-mail: Lfalcone@ag.tamu.edu

Jeffrey R. Stapper
San Patricio County Extension Agent-AG
219 N. Vineyard
Sinton, TX 78387
Bus 361-364-6234
FAX 361-364-6237
e-mail: j-stapper@tamu.edu

Harvey L. Buehring
Nueces County Extension Agent-AG
701 East Main Street; Suite 1
Robstown, TX 78380
Bus 361-767-5223
FAX 361-767-5248
e-mail: Hbuehrin@ag.tamu.edu

Technicians, Demonstration Aids and Field Workers for 2005:

Rudy Alaniz, Farm Demonstration Aid and Senior Technician
Mike Hiller, Technician I
Clint Livingston, Technician I

Texas A&M Research and Extension Center, Corpus Christi, TX

Evaluations of Canola Hybrids for Production in South Texas

Background.

Texas Cooperative Extension has been engaged in a partnership with Cargill Specialty Oils to explore the development of canola as an alternative crop in South Texas. In this third year of evaluation, canola made its best yields under conditions found in the winter and spring of 2005. Previously, canola had produced as much as 1600 lbs in Texas A&M Research Station tests, but in 2005 as much as 1,970 lbs/A was achieved with machine harvest. This rivals yields obtained in Canada and where canola is widely-grown for its oil seed. The 2005 production year was intended to be an "expanded acreage project", but the lack of fall rainfall and the late-October arrival of seed caused 8 of our growers to back-out of the project. One farmer's son (Prukop) was killed in a tragic vehicle accident, and the expansion of the project to Jim Wells county was lost. Even so, timely rains and the use of pivot irrigation were useful in producing an excellent canola crop, which was followed with a sorghum double-crop.

Materials and Methods.

Seven canola hybrids/varieties were planted on November 29, 2004, on the Charles and Brian Ring Farm, in the St. Paul area of San Patricio County. Placed in a strip test, accuracy testing was used to remove field variability. The Edroy clay/Orelia sandy clay soils had a full moisture profile at planting; however, the surface dried-out and planting conditions were rough. Even with the Tye Pasture Pleaser drill placing seed precisely in 8-inch rows, at 12 plants per square foot, seed-to-soil contact was marginal and when rated on December 22d, only a 25% stand was present. Just preceding a cold snap, the crop was irrigated with 0.75 inches of water (December 25th). No plant loss was observed during the cold weather. Rainfall recorded monthly at this site was as follows:

December	0.30
January	0.77
February	3.57
March	5.80
April	0.00
May	0.00

Fertility supplied prior to planting was 400 lbs/A of 25-5-0, and no herbicide was used. The previous crop was cotton and harvest was made on 22 April (earliest variety) and 6 May (later varieties). In addition to the test plot, an additional 36 acres were planted to CNH 501, which produced a yield of 1,961 lbs/A. This was planted by Charles Ring at the same time that the canola variety test was established. Because the 36 acres was planted to a greater depth, a far better stand was achieved. The Rings had a second field 3 miles to the east, which was dryland, and produced a yield of 1,150 lb/A, also with CNH 501.

Other Results and Discussion.

The DKL 223 matured first, with a hand-harvested yield of 3,718 lbs/A (adjusted to 10% moisture). This hand-harvested yield suggests that a 47% shattering loss occurred with this early variety. All plots were harvested 14 days later, on May 6th.

Table 1. Comparison of bloom date, lodging, percent moisture and seed yields from a machine harvest

conducted 6 May 2005, Texas Cooperative Extension, Ring Farm, San Patricio County, 2005.

Variety	Bloom Date	Lodging Score[1]	Moisture (%)	Yield[2] (lbs/A)
DKL 223	1/31	3	9.4	1,970
Dow USO 40504	3/4	1	12.6	1,698
Dow USO 40501	2/24	1	7.4	1,648
DKL 35-85	2/24	1	8.0	1,606
CNH 501	2/10	3	10.5	1,594
Dow USO 40503	2/26	1	12.1	1,494
Dow USO 40502	2/26	1	8.9	1,639
Average			9.8	1,639

[1] Lodging score on 6 May, with 1 being very little lodging and 5 being severe lodging.
[2] Yield is adjusted to 10% moisture.

Lodging. At the San Patricio County site, two hybrids were observed with lodging (>30% leaning), while most canola plants remained erect with the other canola types. The lodging hybrids were DKL 223 (DeKalb) and CNH 501 (Cargill). At the Corpus Christi Station, only the DOW USO 40504 demonstrated greater than trace amounts of lodging. This was observed in all three replications of US0 40504. Winds as high as 15.8 mph were measured in December, but at that time the canola was small. Wind speeds as high as 17.4 were measured in March, but soils were not wet at this time. Most of the lodging occurred in the second week of May, when 1.63 inches was measured at the Corpus Christi weather station; however, no rain was received on the Ring Farm at this time(April or May).

Economics. Assuming a price of $ 0.09 per pound, income would have ranged from $131.76/A to $177.30/A, depending on hybrid/variety. Had one been able to harvest the DKL 223 earlier, a gross income of $334.62/A might have been achieved.

Weed Control. The canola hybrids and varieties evaluated over the past 2-3 years have been Roundup Ready, and this herbicide system has not been needed in these production years. Since the crop emerges rapidly and quickly achieves full canopy, weeds are generally shaded-out before they can become competitive.

Oil analysis. is included as an attachment to this report. In table 2, three hybrids are compared for oleic, linolenic and total saturated fats.

Table 2. Comparison of oil analysis of three canola hybrids, Texas Cooperative Extension, Ring Farm, San Patricio County, Texas, 2005.

Variety	C18:1 (oleic)	C18:3 (linolenic)	Total Saturated Fats (%)
CNH 501	67.41	2.82	7.02
DKL 223	66.83	7.51	7.38
DKL 35-85	67.78	5.29	6.62

Table 3. Comparison of bloom dates, lodging score, percent seed moisture and yield per acre, Texas A&M Experiment Station, Nueces County, Texas, 2005.

Variety[1]	Percent Bloom @ 4/26/05	Lodging Score[2] on 4/7/05	Moisture (%)	Yield[3] (Lbs/A)
Cargill V 1032	-	1	10.9	1,687
Dow USO 40501	97	1	11.2	1,559
Dow USO 40505	78	3	10.0	1,538
Cargill CNH 501	-	1	11.4	1,531
Cargil V 1030	-	1	10.6	1,503
Cargill IMC 209	-	1	9.8	1,496
Cargill V 1031	-	1	10.2	1,157
Cargill IMC 111 RR	-	1	8.2	1,155
Dow USO 40502	78	1	8.0	1,148
Dow USO 40503	47	1	9.8	1,131
Average		1.2	10.0	1,391

[1] Of the Cargill selections, only 209 and 111 are varieties; the rest are hybrids.
[2] Lodging scores recorded on 7 May, with 1 being very little present and 5 being very severe lodging.
[3] Seed yields adjusted to 10% moisture.
Note: Station canola test planted 1 November 2005

Another interesting component of the Ring Canola trials, was the sorghum crop that was planted immediately following harvest. Golden Acres GA 737 was planted 13 May 2005, with 200 lbs of 25-5-0 fertilizer. No herbicide was used.. This crop was watered 3X using center pivot irrigation, with 1.25 inches being applied in each event, for a total of 3.75 inches. The nearest weather station reported 9.92 inches of rainfall during the growing season. Approximately 5.5 inches was received just prior to and through the boot and bloom growth stages. This second crop of sorghum is just now turning red and appears to have the potential to produce 2000+ pounds of grain, which may make this production system more profitable. Results of the larger canola hybrid performance test conducted on the rear of the Texas A&M Research and Extension Center, are reported in table 3.

Insect Control. No significant insect problems were observed. Leaf-footed plant bugs, chinch bugs and stink bugs were observed in low numbers. No insect sprays were made because no insect thresholds were met. A minimal amount of bird damage was observed to green pods (see image, p 10).

Rainfall. The TAM-CC site received 15.28 inches of rainfall from 1 October 2004 to 31 May 2005 (see p. 16, Quick Stats). The Ring Brothers site received 10.44 inches of rainfall from 1 December 2004 to 31 May 2005 (see p 12, Quick Stats). Irrigation supplied 0.75 inches of additional water (pre-plant), for a total of 16.03 inches.

Conclusions.

1. **Lodging:** DKL 223 and CNH 501 expressed more stalk lodging on the Ring Brothers site than any other variety evaluated. On the TAM-CC site, USO 40504 was the only variety with substantial lodging. CNH 501 stood well on the TAM-CC site in 2005.

2. **Plant Height:** Dow USO 40503 was the tallest hybrid/variety at the TAM-CC location. The tallest hybrids/varieties did not seem to be the ones that lodged.

3. **Seed Yields (Irrigated):** Highest yields obtained under irrigation in 2005 were with DKL 223 (1970 lbs/A MH; 3718 lbs/A HH). Some 400+ lbs/A lower (MH) were Dow USO 40504, 40501, DKL 35-85 and CNH 501, which grouped within 100 lbs/A of each other. A third group yet 100 lbs/A lower, included Dow USO 40503 and 40502.

4. **Seed Yields (Dryland):** The highest dryland canola hybrid/variety at the TAM-CC site was V 1032 with 1,687 lbs/A. Five hybrid/varieties grouped 1596-459 lbs/A as follows: Dow USO 40501, 1,559; Dow USO 40505, 1,648; CNH 501, 1,531; V 1030, 1,503; and IMH 209, 1,157; IMC 111RR, 1,155; USO 40502, 1,148; and USO 40503, 1,131.

5. **Blooming Dates:** USO hybrids/varieties 40501 and 40502 bloomed before 40503 and 40504. Except for CNH 501, the earliest blooming hybrid/variety was DKL 223, which bloomed on 31 Jan 05. At the San Patricio location, the earliest blooming selection was also the highest yielding (DK 223).

6. **Harvest Methods:** Canola should be harvested at the earliest practical date. Wind-rowing should be considered, similar to what is done in Canada. The vast differences in the hand-harvest and the machine harvested yields suggests that lodging and shattering may have lost much more seed than was realized.

7. **Prompt Harvest Necessary.** Visually it if difficult to estimate how significant shattering losses may be. Canola should be harvested at the earliest practical date. Wind-rowing should be considered, similar to what is done in Canada. The vast differences in the hand-harvest and the machine harvested yields suggests that lodging and shattering may have lost much more seed that was realized.

Recommendations.

1. **New Work.** That a canola date-of-planting study be implemented in 2005 on the Texas A&M Research and Extension Center, to determine the most favorable time to establish canola; and planting date's impact on stand establishment and oil seed yields.

2. **That Non-RR varieties** of canola also be made available to South Texas producers that would allow them to avoid technology charges that are unnecessary, which would increase the profitability of canola as an alternative crop. The price of seed and seed treatment appears to be a major barrier in signing-on new growers, because the "up-front costs" are so high. Seed needs to be available and ready for farmer access in early October.

3. **Market Price.** With increasing diesel and fertilizer costs, the price paid for canola seed needs to

be better in 2006, and payment for the previous year's crop must be made in a more timely fashion. The contract price for confectionary sunflower seed was 16 cents/pound in 2005, and the market is expected to be similar in 2006, according to the confectionary sunflower industry representatives (Triumph and Red River). The demand for confectionary (edible) seed remains high, world-wide. A contract price of 12 cents/pound would remove some of the risks associated with growing canola dryland. A producer might be encouraged to grow canola, if the price of the planting seed could be deducted from his production sales, in May (at harvest time).

4. **Future of Canola.** The future of canola in South Texas is with some of the region's major growers having a good experience with Cargill Specialty Oils. We have made some good progress with hybrid and variety selection, and have found growing canola to require but little insect and weed control. The most important aspects are "getting a stand" in the Fall (establishment time), and getting a good price for the canola seed.

5. **Promotion Time.** The time to solicit for new growers and to promote canola production is in August-September. To do this, a favorable price must be established, and the seed must be available for pick-up at the Bee County Coop (at Tynan, Texas). Cargill Specialty Oils needs to be at least as aggressive as the sunflower industry, in promising a favorable contract price to the grower.

6. **Getting a Stand.** If these potential growers are not "on-board" and committed to canola production in September-October, then the planting dates will not be sufficient for high yields, if they make commitments in November or December. Our fields and soils need to be prepared and fertilized in early September when they can "catch a rain", and allow the clods and soils to settle and mellow. A favorable seed bed with good seed-to-soil contact is necessary to establish canola without irrigation, successfully in South Texas.