

Safflower Variety by Date of Planting Trial, Safford Agric. Center, 1993

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Abstract

Five safflower varieties were planted at five different dates on the Safford Agricultural to determine which date of planting and variety would be best for this part of the high desert of Arizona. The earliest date, February 2nd, had the highest yield across all varieties and there was no statistical difference between any of the varieties. Oil content of the seed also seemed to be highest with the earlier plantings.

Introduction

In 1989 Dan Bryant (1) of California Arizona Farm Press raised the question as to whether safflower would come to its own in California. The price had reached \$300/ton, and profits could be made in growing the crop. By 1992, growers in central Arizona wanted a part of the action and in response to grower's inquiries, Brooks Taylor and Sam Stedman (2) began a variety testing program. By 1993, growers in Graham and Cochise counties were interested in seeking their fortune in safflower so this test and a variety trial in Cochise county were implemented.

Materials and Methods

Two Cal West and three SeedTec varieties were obtained to test at this site. It was decided to have five dates of planting starting as early in the year as possible and continuing every two weeks. A wet winter delayed the first planting to the 2nd of February and the other four dates followed on schedule. A history of the important features of the trial are listed below:

Crop History:

Previous crop: Cotton

Soil type: Grabe clay loam

Planting dates: 2 February, 17 February, 1 March, 16 March, 31 March 1993 Rate: 25 lbs/ac

Fertilizer: 200 lbs/ac 16-20-0 drilled in at planting and 200 lbs/ac urea water run in June

Herbicide: Treflan, pre-plant incorporated

Insecticide: None

Irrigation: Furrow, watered up and 7 irrigations (ca. 2 acre feet)

Harvest date: 28 July

All plots were harvested at the same time using a Gleaner Model L combine and all moistures were below 5%. Samples were taken to determine bushel weights and to send for oil analyses.

Results and Discussion

Yields, oil content and other agronomic data are found in Table 1. It should be noted that the data in the table are averaged over varieties or dates. For example, the upper part of the table shows the effects of date of planting averaged over all varieties and the bottom part of the table show the effects of variety averaged over all dates of

planting. From the table it can be seen that yields were highest for the first date of planting, decreased and then increased again. No explanation is given for the increase for plantings later in the season. It is thought to be weather related and probably not repeatable. The results of this study and the 1993 study in Pinal county by Taylor and Stedman (3) indicated that the earliest planting yielded more than the other plantings. UCD Farm Advisor Tom Kearney (4) stated, however, that earlier plantings usually produce larger plants, but not necessarily higher yields. Percent oil, bushel weights and plant heights were also higher in the February plantings in this study.

In the bottom part of Table, the effects due to variety are seen averaged over dates of planting. No differences in yield were seen by variety. No statistics were done on the percent oil, because replicate samples were combined to make a single sample for oil analysis. It does appear, however, that the SeedTec varieties had slightly higher oil content than the Cal West varieties. In height, CW 4440 is the tallest plant and S 501 the shortest. The difference in height is not great enough to be of agronomic significance. Significant differences are seen in plant populations, but these differences are also not considered to be of agronomic significance. Safflower has the ability to grow a plant structure that fits the space it has to grow in.

Tables 2 and 3 show the yield and oil percent by variety by date of planting. These tables give one the opportunity to see how each variety preformed at each planting date. Figure 1 combines these to tables in graphical form, displaying the oil content in pounds per acre across varieties and date of planting. SeedTec 555 looks particularly good in this chart because its yield and oil content were the highest in the trial.

References

1. Bryant, Dan. 1989. Safflower: Will the crop come into its own in 1989? California Arizona Farm Press, January 14, 1989, p. 4.
2. Taylor, Brooks and Sam Stedman. 1992. Personal communication.
3. Taylor, Brooks and Sam Stedman. 1993. Safflower testing newsletter sent from Pinal County Cooperative Extension.
4. Kearney, Tom. In: Rice Notes, February 1992, Edited by John F. Williams, Farm Advisor for Sutter/Yuba Counties, 142A Garden Highway, Yuba City, CA 95991.

Table 1. Yields, percent oil and other agronomic values by variety and by date from a two-way analysis of variance.

Variable	Yield	Percent Oil	Bushel Weight	Plant Height	Plants per acre
By Date					
Date 1	2283 a	42	39.6 a	33.6 a	264627 b
Date 2	1697 b	40.67	38.5 b	31.2 b	201465 c
Date 3	1302 d	39.46	37.9 c	32.2 b	231957 c
Date 4	1375 cd	39.85	37.0 d	29.2 c	360459 a
Date 5	1575 bc	39.49	37.3 d	29.1 c	369171 a
By Variety					
S 555	1709 a	40.68	38.3 ab	31.6 b	294030 a
CW 74	1694 a	39.49	38.1 b	30.7 b	261360 b
S 501	1657 a	40.86	37.2 c	28.8 c	238491 b
CW 4440	1629 a	38.82	38.1 b	33.0 a	322344 a
S 541	1543 a	41.63	38.7 a	31.2 b	311454 a
Average	1646.4	40.29	38.03	31.06	285535
LSD(05)	234.6	--	0.468	1.135	30893.9
CV(%)	30.4	--	3.45	9.12	31.1

Table 2. Safflower yield in pounds per acre by variety and by date of planting.

Variety	Dates of Planting					Averages
	2 Feb	17 Feb	1 March	16 March	31 March	
S 555	2554 a	1611 a	1339 a	1543 a	1497 a	1709 a
CW 74	2051 a	1974 a	1361 a	1520 a	1565 a	1694 a
S 501	2364 a	1702 a	1180 a	1452 a	1588 a	1657 a
CW 4440	2201 a	1543 a	1429 a	1202 a	1770 a	1629 a
S 541	2246 a	1656 a	1202 a	1157 a	1452 a	1543 a
Avg	2283.3	1697	1302.3	1374.9	1574.5	1646.4
LSD(05)	547.7	522.5	525.2	692.2	369.9	
CV(%)	15.4	20.8	34.3	29.1	15.5	

Table 3. Safflower oil content in percent by variety and by date of planting.

Variety	Dates of Planting					Averages
	2 Feb	17 Feb	1 March	16 March	31 March	
S 555	43.58	40.42	40.06	40.54	38.8	40.68
CW 74	41.02	40.22	38.38	39.32	38.5	39.49
S 501	41.88	41.46	40.1	39.6	41.24	40.86
CW 4440	39.84	38.54	38.04	39.02	38.64	38.82
S 541	43.7	42.7	40.7	40.78	40.28	41.63
Avg	42	40.67	39.46	39.85	39.49	40.29

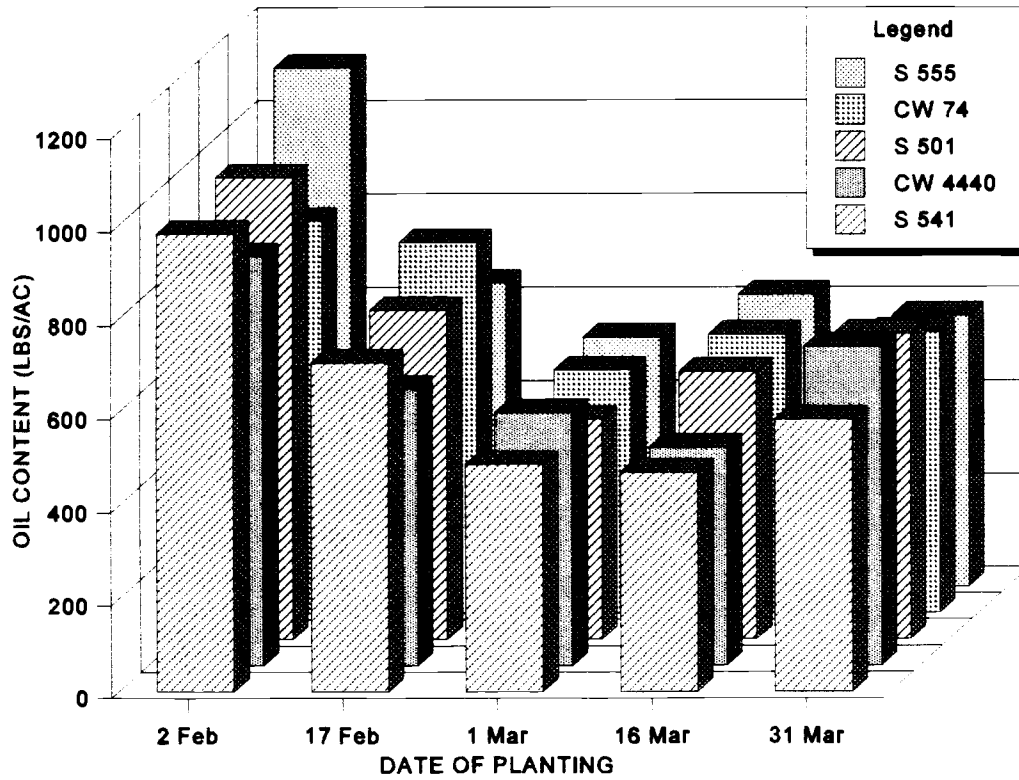


Figure 1. Oil content in safflower in pounds per acre by variety and by date of planting.