https://doi.org/10.29321/MAJ.10.A02941

Madras agric J. 66 (4) : 211—214, April, 1979.

Co. 1 A High Yielding Non-Spiny Safflower (*Carthamus tinctorius* L.)

M. SUBRAMANIAN[1], N.M. RAMASAMY[2], M. RANGASAMY[3], R. APPADURAI[4], N. NATARAJARATNAM[5] and B. SUBBALAKSHMI[6]

Screening of safflower germplasm maintained in the Tamil Nadu Agricultural University resulted in isolation of a promising non-spiny safflower variety. This selection CTS 7403 was found to be superior in yield and oil content incomparison with K 1 (spiny) safflower released earlier. It gave an average yield of 800 Kg/ha. The seed of CTS 7403 possesses 32.70 per cent oil. It is tolerant to *Alternaria carthami* and moderately resistant to wilt. This selection is therefore released as CO 1 safflower.

Safflower *(Carthamus tinctorius* L.*)* is an important miner oil seed crop, and is well recognised for its use in the industries and domestic purposes. This crop is populor and grown under extensive areas in North India as it fetches substantial returns under rainfed conditions. The oil (saffalo) is having anti cholesterol properties. In Tamil Nadu only meagre work has been done in this important commercial crop. During 1969 an improved strain K1 was released. However, due to its spiny nature, this variety did not become popular. The farmers felt difficult to take up intercultural operations and harvesting. Therefore to develop a spineless safflower variety coupled with high grain and high oil content, investigations were started at the Tamil Nadu Agricultural University, Coimbatore and the results are presented hereunder.

MATERIAL AND METHODS

Evaluation and screening were started since 1972 with 1463 safflower types available as germplasm collection at the Tamil Nadu Agricultural University, Coimbatore. During 1974, a variant with high yielding potential was selected from an Egyptian non-spiny accession (PI 250528). The selection was redesignated as CTS 7403 and was tested in yield trails adopting standard randomised replicated design. Multilocation tests in different regional centres of Tamil Nadu Agricultural University as well as in the All India Co-ordinated varietal trials were also conducted. Resistance to *Alternaria* and wilt was scored under natural conditions during the period of experimentation tests. The oil analysis was done with Soxhlet apparatus.

RESULTS AND DISCUSSION

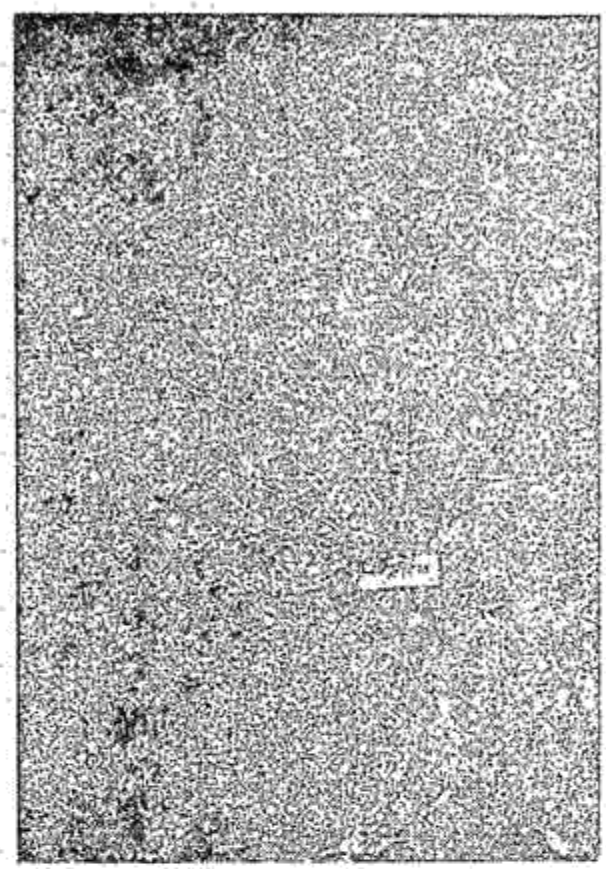
The morphological attributes of CTS 7403 are presented in Table I. (Fig). The selection was 75 - 90 cm tall. The plant has dark green leathery leaves without marginal spines. The capitulum bears only discflorets with

1-6 : Department of Agricultural Botany, Tamil Nadu Agricultural University, Coimbatore - 641 003.

TABLE I. Distinguishing morphological features of Co 1 (CTS 7403) in comparison with K 1 Safflower

Characters	Co.1 (CTS 7403)	K1
Height (cm)	75.90	0.70
Number of primary branches	10.60	9.20
Number of secondary branches	19.40	6.00
Number of heads / plant	23.70	7.80
Diameter of primary Head (cm)	2.23	2.19
Number of seeds / primary head	39.23	3.70
Stem thickness (cm)	0.97	0.70
Spiny	Non-spiny	Spiny
Flower colour		
a) Initial	Pale-yellow	yellow
b) Maturity	Purple	Purple
Duration (daps)	120-125	120-12
Single plant yield (gm)	13-15	10-12
Yield Kg / ha	800	700
Disease resistant		
a) Alternaria	Tolerant	Subscept
b) Wilt	Moderately resistant	Susceptible
a) Seed colour	White	White
b) Size (cm)	8.0 x 3.8 Long and slender	6.0 x 3.6 Medium round and bold
100 Seed weight (gm)	5.16	4.83
Oil content (%)	32.70	30.29
Oil production Kg / ha	261.60	210.00
Per day oil production (Kg)	2.18	1.75
Head to seed ((%)	55.56	52.43

pale yellow carolla tubes. The corolla tubes become purple on maturity. The seed of this variety is long and slender with white seed coat (8.3/3.8 mm). It also registered higher 100 seed weight than K1. The grain yield recorded by CTS 7403 in various trials conducted at University centres and at Regional level is presented in Table II, III and IV. During 1976 winter, in the All India Co-ordinated varietal trial CTS 7403 safflower recorded the highest yield of 1096 kg/ha at Berhampore (West Bengal) and topped the list. In overall performance it was adjudged as the IInd best yielder among the 22 varieties tested. Similarly during 1977 winter it recorded the highest yield of 1550 Kg/ha at Rajendrangar (Andhra Pradesh) and 1745Kg/ha at Varanashi (Uttar Pradesh).



At Coimbatore it gave the highest yield of 1220 Kg/ha under rainfed conditions. This is highly drought resistant and comes up well in black cotton soil during November - February season. On an average the selection gave an yield of 750 - 800 Kg/ha as against 700 Kg recorded by K1. CTS 7403 is tolerant to *Alternaria* leaf spot, and moderately resistant to wilt. The disease score of *Alternaria* leaf spot at Nimpkar (Maharashtra) was as low as 1.75 for CTS-7403 as against 2.63 for K1. (Anon 1977-78).

The oil analysis by soxhlet apparatus has shown that CTS 7403 has a mean oil content of 32.07 per cent as against 30.29 per cent recorded in K1.

Based on the superior attributes and high yield and oil content CTS 7403 has

TABLE II. Performance of Co.1 (CTS.7403) at Coimbatore and other Research Stations

Place and year		Yield Kg/ha		
		Co 1 (CTS 7403)	K. 1	% over K.1
COIMBATORE (IRRIGATED)				
1976 (Summer)		720.10	587.60	22.60
1977 (Summer)		970.72	804.82	20.61
ALIYARNAGAR				
1977 (Winter)		778.00	575.00	35.80
BHAVANISAGAR				
1977 (Winter)		1605.71	1194.29	36.11
	Total	4074.53	3161.71	114.62
	Mean	1018.63	790.43	28.66
COIMBATORE (RAINFED)				
1975 Winter		922.80	860.00	7.00
1976 Winter		507.00	437.00	16.00
1976 Winter		698.00	684.00	5.05
1977 Winter		1220.00	1026.00	18.01
KAVERIPATTINAM				
1977 Winter		550.00	500.00	10.00
SRIVILLIPUTHUR				
1977 Winter		444.60	248.20	79.13
	Total	4341.00	3755.20	133.09
	Mean	723.50	625.87	22.18

TABLE III. Performance of Co.1 (CTS.7403) in Coordinated varietal trials at all-India level

		Yield Kg/ha		
		Co.1 (CST 7403)	K. 1	% over K. 1
976 WINTER				
Coimbatore (Tamil Nadu)		698	684	2.05
Rajendranagar (Andhra Pradesh)		536	434	23.50
Berhampore (West Bengal)		1096	612	79.08
	Total	2330	1730	104.63
	Mean	776.67	576.67	34.88
977 WINTER				
Sanke (Bihar)		815	663	22.93
Jalgaon (Maharashtra)		1565	1527	2.49
Rajendranagar (Andhra Pradesh)		1550	997	55.47
Varanasi (Uttar Pradesh)		1745	1197	45 78
Annigeri (Karnataka)		1863	1603	16.22
Berhampore (West Bengal)		618	593	4.21
Chiplima (Orissa)		128	97	31.96
Chindwada (Madya Pradesh)		285	234	21.79
Coimbatore (Tamil Nadu)		1220	1026	18 91
Dholi (Bihar)		1129	1020	10.69
	Total	10858	8957	230.46
	Mean	1085.80	895.7	23.04

TABLE IV. Overall Performance of CO.1 (CTS. 7403)

	Yield Kg/ha	
	CO.1 (CTS.7403)	K. 1
Research Station		
1975-76	1018.63	790.43
1976-77	624.36	545.84
Regional Level		
1976	816.00	523.00
1977	1085.80	895.70
Total	3544.79	2754.97
Mean	886.00	688.74
% over K.1	28.64	...

been released as CO. 1 safflower for large scale cultivation in Tamil Nadu.

REFERENCE

ANNUAL REPORT, 1977-78. *Integrated scheme for safflower improvement*. Nimbkar Agricultural Research Institute Phaltan, Maharashtra.