

Co. 1. Sunflower (*Helianthus annuus* L.)

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A dwarf version of sunflower (70 cm) maturing in 65 days has been developed from an accession "Cernianka-66" of Russian origin. In various on-farm trials in the cultivators' fields it recorded mean yields of 923 and 804 kg/ha under irrigated and rainfed conditions respectively. An average yield of 1126 kg/ha was realised in large scale demonstration plots. The short duration and dwarf plant type permit a closer spacing, 30 x 15 cm to be optimum as against the normal spacing of 30x30 cm for the other varieties so as to maintain a larger population. This earliest maturing genotype fit to be raised in the kharif, rabi and summer seasons has been released as CO. 1 sunflower. The mean per day production of this variety is 17.7 kg/ha under irrigated and 13.8 kg/ha under rainfed condition. It is well suited for being raised as a catch crop in garden lands.

The importance of sunflower (*Helianthus annuus* L.) as a cash crop is being increasingly realised. In Tamil Nadu it is being cultivated in an area of over 1.5 lakh hectares both under irrigated and rainfed condition. Most of the cultivated varieties have a duration of 75 to 90 days and are tall in habit. It was felt that an earlier maturing variety which can be raised with other crops like groundnut, ragi, etc. under mixed, inter and multiple cropping systems would be greatly welcome and therefore, investigations were commenced in the year 1976.

MATERIAL AND METHODS

Selection pressure was applied on a Russian accession 'Cernianka-66' for early duration and dwarf stature. The progenies were subjected to extensive yield tests from 1976-1981. Based upon the results from the station trials, tests were carried out for yield under cultivators' fields.

Resistance to pests and diseases was recorded under natural conditions while the oil analysis was carried out with Soxhlet apparatus. Pooled analysis of yield data collected from 10 environments, the mean performance in adaptive research trials carried out at 28 centres, the average yield in 5 large scale demonstrations under farmers holdings and per day yield were taken into consideration for reaching conclusion.

RESULTS AND DISCUSSION

One of the selected progenies from the Russian accession 'Cernianka-66' designated SUF.2, was dwarf (70cm) with a duration of 65 days in contrast to 'Cernianka-66' growing to a height of 120 cm with the same duration. The number of leaves per plant ranged from 16 to 18 and the diameter of capitulum measured from 8 to 10 cm in SUF.2 as against the parental type with 25 to 30 leaves and 13 to 15 cm of capitulum diameter

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(Table-1). Raised in 5 seasons each under irrigated and dry conditions the selection SUF.2 gave mean grain yields of 1148 kg/ha and 906 kg/ha respectively (Table 2) representing mean per day seed yields of 17.7 and 13.8 kg/ha respectively. On per day production basis this selection is preferable to the other cultivated varieties viz., K2, EC.68414 (K1) and EC.68415. This selection is comparable with the other long duration varieties in oil content also.

In adaptive research trials at 28 centres, SUF. 2 recorded average seed yields of 923 kg/ha under irrigation and 804 kg/ha under rainfed culture. The average yield of 4 rainfed demonstration plots of 25 cents each, grown under rainfed condition was 1203 kg/ha. The irrigated crop under such demonstrations gave 1320 kg/ha (Table 3). Results of an yield trial involving 9

different spacings indicated that 30x15 cm, by virtue of a lower seed rate and better convenience in sowing, was the most optimum one.

This selection is moderately resistant to *Alternaria* leaf spot and rust. The incidence of root rot was less (25 to 35%) than the check varieties (50%). It is also moderately resistant to white fly when compared to other varieties under cultivation. However, it is possible to control these diseases and pests effectively through conventional plant protection measures.

In view of the distinct advantages like early maturity, short stature, high per day productivity, Co. 1 sunflower released during 1982 may prove valuable as a companion crop with groundnut, pulses, ragi etc., under mixed, inter and multiple cropping systems.

Table 1 Distinguishing characteristics of Co. 1 Sunflower

Duration	65 days
Height	70 cm
No of leaves per plant	16 to 18
Girth of the stem	1.1 to 1.3 cm
Diameter of the capitulum	8 to 10 cm
1000 grain weight	45.5 g
Oil content	36.7 %
Seed colour	Dark grey

Table 2. Performance of Co. 1 Sunflower at Coimbatore over 10 environments

Particulars.	Varieties			
	SUF,2	K2	EC. 68414	EC.68415
1. Duration (days)	65	80	85	90
2. Grain yield (kg/ha)				
i. Irrigated :				
(a) Kharif 1979	1318	1554	1421	1385
(b) Rabi 1979	923	1117	1207	1195
(c) Summer 1980	1663	1576	1915	1740
(d) Rabi 1980	1256	1390	1256	1600
(e) Summer 1981	854	781	1039	1056
Mean	1148	1283	1368	1395
per day production	17.7	16.0	16.1	15.3
ii. Rainfed				
(a) Kharif 1979	1275	1094	1360	1344
(b) Rabi 1979	615	682	754	785
(c) Kharif 1980	1213	1559	1848	1650
(d) Rabi 1980	1046	1031	1050	1450
(e) Kharif 1981	380	384	440	500
Mean	906	951	1090	1146
Per day production	13.8	11.9	13.2	12.7
3. Oil yield (kg/ha)				
i. Irrigated	454.4	526.8	520.2	531.9
Per day production	7.0	6.6	6.1	5.9
ii. Rainfed	370.9	386.0	481.4	518.9
Per day production	5.7	4.8	5.7	5.8

Table 3. Yield data of Co. 1 Sunflower from Adaptive Research Trials

Season	District	Varieties	Yield range (kg/ha)						No. of centres	
			101 to 300	301 to 600	601 to 900	901 to 1200	1201 to 1500	1500 to 1800		
Irrigated	Coimbatore	SUF.2	x	1	x	3	1	x	5	
		K2	x	1	x	1	3	x	5	
	Dharmapuri	SUF.2	x	1	x	x	x	x	1	
		K2	x	1	x	x	x	x	1	
	Madurai	SUF.2	x	x	x	1	2	x	3	
		K2	x	x	x	1	1	1	3	
	Salem	SUF.2	x	1	1	x	x	1	3	
		K2	x	1	1	x	x	1	3	
	Trichy	SUF.2	1	x	3	x	x	x	4	
		K2	1	1	2	x	x	x	4	
	Total	SUF.2	1	3	4	4	3	1	16	
		K2	1	4	3	2	4	2	16	
	Rainfed	Coimbatore	SUF.2	x	x	x	2	x	3	5
			K2	x	x	x	1	1	3	5
Dharmapuri		SUF.2	2	1	x	x	x	x	3	
		K2	2	1	x	x	x	x	3	
Madurai		SUF.2	x	x	1	x	x	x	1	
		K2	x	x	1	x	x	x	1	
South Arcot		SUF.2	x	1	x	x	x	x	1	
		K2	x	1	x	x	x	x	1	
Trichy		SUF.2	2	x	x	x	x	x	2	
		K2	2	x	x	x	x	x	2	
Total		SUF.2	4	2	1	2	—	3	12	
		K2	4	2	1	1	1	3	12	

Mean yield kg/ha (1) Irrigated : SUF.2 923
K2 1048
(2) Rainfed : SUF.2 804
K2 852

Table 4
Yield data of Co. 1 Sunflower from large scale demonstration

S. No.	Year	Village and District	Yield (kg/ha)
I. Rainfed			
	(July-Sept. 1980)	Coimbatore-I	1000
		Coimbatore-II	1987
		Madurai-I	1500
		Madurai-II	625
		Mean	1203
II. Irrigated (Fed-1981)			
	April	Ramachandrapuram, Coimbatore	1320

Table 5
Influence of spacings on yield of Co. 1 Sunflower

Spacings (cm)	Grain yield (kg/ha)	
	Kharif 1982	Summer 1979
15x15	1192	1003
15x20	1316	1053
15x30	1239	1050
20x15	1332	901
20x20	1457	762
20x30	984	799
30x15	1357	995
30x20	1147	784
30x30	1049	598
C. D.	225	63