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Evolution of a New Strain of chillies (*Capsicum annuum* Linn) in *Madras State* *

by

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Synopsis : In chillies, selection work was carried out for evolving strains with high yield potential. Two selections recorded consistently increased yield in the trials conducted at the Agricultural Research Station, Kovilpatti and in the districts for three years and one of them was released as an improved strain K.1. Its performance is discussed in this paper.

Introduction : Chillies (*Capsicum annuum* Linn) is an important condiment and spice crop which is of commercial importance in Madras State. It is cultivated in an area of 67,100 hectares, normally with an estimated average production of 87,600 tonnes. The southern region, consisting of Madurai, Ramanathapuram and Tirunelveli districts has more than 50 per cent of the area under chillies in Madras State.

In Madras State, chillies are raised mainly as an irrigated crop during the North East monsoon period. The crop is sown in September and retained in the field till May. There are pockets where the crop is also raised in summer season during April and in South West monsoon period during June. The green chillies are usually consumed as a vegetable, locally. The dry chillies are commercially more important and are marketed through important centres for internal consumption and also a small portion is exported to Ceylon, Indonesia *etc.*

Review of work done in the country: As at Lam, Guntur, the strain G. 1. chillies was released (Neelakantan 1953). In 1954, the prolific strain G. 2 (a selection from NP 46-A) which was found to give better yield than G. 1 was released (Murthy and Murthy, 1958). In 1962, G. 3 (CA 451-1) which was superior to local varieties as well as G. 1. and G. 2. was evolved. In addition, a few more promising cultures, CA 766-1-3, CA 743-3 and cross 33-D were under trial. (Murthy, 1964).

Under the scheme for research on chillies initiated at Achalpur in Maharashtra State, a selection, CA 452-1 was found to give higher yield than the rest both under rainfed and irrigated conditions. (*Anon* 1960-61). As a result of pure line selection work done in Mysore State, 40 promising selections from Hirekerur and 20 others from Sankeshwar were isolated. In the Chillies Research Scheme at Malda, West Bengal, six green types and six dry types suitable for cultivation during both *Kharif* and *Rabi* season were evolved (*Anon* 1960-'61).

In Madras State, a scheme for the improvement of chillies was initiated at the Agricultural Research Station, Kovilpatti during the year 1955 with the object of evolving high yielding strains of chillies better than the local with a wide range of adaptability to suit varied environments with earliness, resistance to pests (like thrips) and diseases and possessing the desired colour and pungency.

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* Received on 20—4—1965.

Materials and methods: From the collection of chillies types consisting of 106 from other countries, 219 from other states in India and 356 from Madras State, promising single plants were selected and studied against *Sattur Samba* as control. Among them, two promising selections, B72A-14 and B70A-1 (both from Assam) have been isolated. The market value of the fruits was judged by the shape, size and shining red colour of fruit. Pungency was estimated by the chemical method of '*North*' (1949) and tolerance to thrips was rated in different grades in comparison with the local variety.

The two selections, B72A-14 and B70A-1 which recorded increased yields over local at the Agricultural Research Station, Kovilpatti were tried in scattered block trials for three years. In the first year of trial during 1960-'61, selection B72A-14 was tested along with *Sattur Samba* and the local of the respective places. In 1961-'62 and the subsequent year, two selections, B72A-14 and B70A-1 with *Sattur Samba* were tried along with the local of the respective places. The market value of the two selections was adjudged in comparison with the local variety.

Results: The yield of dry chillies of the two selections. *Sattur Samba* and the local of the respective places of trial was recorded and the results are summarised in Table I.

TABLE I

District trial with improved cultures of chillies.

S. No.	Culture	Origin	Mean yield in kg/ha		
			1960-'61	1961-'62	1962-'63
1.	B72A-14	Assam	1580 (118)	1738.9 (121)	1688.0 (112)
2.	B70A-1	Assam	—	1975.5 (130)	1678.8 (111)
3.	*Sattur Samba*	Kovilpatti	1589·8 (119)	1990.5 (138)	1697.7 (112)
4.	Local	Respective places	1337.8 (100)	1440.7 (100)	1511.4 (100)
Significant at 5% level			Yes	Yes	No
Standard Error			49.2	146.4	112.9
Critical Difference			142.1	413.0	—

Conclusion:— 1960-'61 : *Sattur Samba, B72A-14,* Local
1961-'62 : *Sattur Samba, B70A-1, B72A-14, Local*
1962-'63 : Not significant.

Note:— Figures in parenthesis show yield expressed as percentage on Local.

In the first year of trial, selection B72A-14 and *Sattur Samba* gave average increased yields of 18 per cent and 19 per cent respectively over the local. In the next year, two selections, B72A-14 and B70A-1 and *Sattur Samba* yielded 21 per cent, 30 per cent and 38 per cent higher than the local respectively. In the third year, the two selections, B72A-14 and B70A-1 and *Sattur Samba* recorded increased yields of 12 per cent, 11 per cent and 12 per cent respectively on an average over the local. In the Research Station at Kovilpatti also, the selections, B72A-14 and B70A-1 gave respectively 18 per cent and two per cent increased yield over *Sattur Samba* (*Vide* Table II). The two selections were also more tolerant to thrips (*Scirtothrips dorsalis* Hood) than *Sattur Samba* and local. In chillies, fruits are valued for their length, colour, high seed content and pungency. The economic characters of the two selections tested in comparison with *Sattur Samba* and the local variety are presented in Table III.

TABLE II.

Results of trial of the cultures B 72A-14 and B 70A-1 at the Regional Research Station, Kovilpatti

Cultures	YEAR													
	1957—'58		1958—'59		1959—'60		1960—'61		1961—'62		1962—'63		Average	
	Yield in kg/ha	Percentage over local	Yield in kg/ha	Percentage over local	Yield in kg/ha	Percentage over local	Yield in kg/ha	Percentage over local	Yield in kg/ha	Percentage over local	Yield in kg/ha	Percentage over local	Yield in kg/ha	Percentage over local
1. B 72A-14	2,520	138	1,968	110	2,191	106	1,032	143	2,565	111	1,148	116	1,904	118
2. B 70A-1	1,745	95	2,036	113	2,407	116	1,155	160	1,692	73	890	90	1,654	102
3. *Sattur Samba* (local)	1,832	100	1,786	100	2,076	100	720	100	2,306	100	990	100	1,618	100
Significant to 'F' 0·05 level	Yes		Yes		Yes		Yes		No		Yes			
Standard Error	126·6		112·1		55·7		78·0		212·8		91·0			
Critical difference	393·2		331·5		175·5		237·0				261·0			

TABLE III.

Qualitative characters and pungency of the cultures B 72A-14 and B 70A-1

(Average of six years)

S. No	Culture	Origin	Length of fruit in cm	Girth of fruit in cm	Weight of fruit with calyx in gm	Weight of fruit without calyx in gm	Number of seeds per fruit	Weight of seeds per fruit in gm	Colour of fruit	Thickness of fruit coat or pericarp in mm	Pungency *Capsaicin* grams per 100 gm of dry chillies on moisture free basis	Thrips tolerance grade
1.	B 72A-14	Assam	6·62	3·20	0·76	0·70	73	0·31	Shining dark red	0·09	1·75	1·45
2.	B 70A-1	Assam	5·10	2·70	0·55	0·50	51	0·23	Dark red	0·12	0·80	1·15
3.	*Sattur Samba* (Local)	Kovilpatti	6·32	3·36	0·80	0·74	60	0·34	Red	0·10	1·47	2·00

NOTE: In grading tolerance to thrips, the infection on the local variety was taken as 2. More tolerance was ranked as 1 and lesser tolerance than the local as 3.

The selection B72A-14 excelled others having longer fruit size, higher seed content, shining red colour and pungency. On account of these desirable characters, this selection fetched a premium of Rs. 10/- per quintal over the local as shown below.

S. No.	Selection No.	Rate per quintal of dry chillies. (Average of three years)
1.	B72A-14	Rs. 215.00
2.	B70A-1	Rs. 210.00
3.	Local	Rs. 205.00

Summary and conclusion: In the trials conducted in the Regional Research Station, Kovilpatti and and in the districts, the selection, B72A-14 excelled all others both in yield and quality of fruits. It fetched a higher price on account of its superior fruit quality. Thus, it is doubly advantageous to the grower as the selection gives not only higher yield but also better quality fruits. The consumer also stands to benefit as a little quantity will suffice on account of its high pungency. The selection was, therefore, released as an improved strain renamed as K. 1. chillies for cultivation, in the Madras State.

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REFERENCES

Anonymous 1960-61 *Annual progress report of the scheme for the improvement of chillies at Achalpur.* Maharashtra State.

——— 1960-61 *Annual progrcse report of the scheme for the improvement of chillies,* Malda, West Bengal.

——— 1964 Chillies Research Workers' meeting held at Bapatla published in ICS & CC 88-89.

Murthy, B. S. and N. S. R. Murthy 1958 A brief note on the chillies improvement work at Agricultural Research Station, Lam. *Andhra agric. J.*, 5 (3).

Murthy, B. S. 1964 Chillies improvement work - A prospect and retrospect, Chillies Research Workers' meeting held at Bapatla published in ICS and CC 26-33.

Neelakantan, L. 1953 Bulletin on chillies. Madras State Department of Agriculture.

North, H. 1919 "Colorimetric determination of *capsaicin* in *oleoresin of capsicum*" *Anly. Chem.* 21, 934