

A note on the evolution of the long linted Cottons for the Rice Fallows in the Madras State.

by

N. VENKATARAMAN.

Introduction: The cultivation of cotton as a remunerative cash crop in between two crops of paddy in the rice growing regions of Madras has been made possible by the successful introduction of the short duration variety of cotton P 216 F. from the Punjab in the year 1950. This variety which has a duration of about five months is capable of yielding normally 250-300 pounds of lint per acre in addition to possessing a staple of 15/16", a ginning outturn of 32% and spinning performance of 30's (counts). A scheme financed by the Indian Central Cotton Committee has been functioning in Madras State since April 1954 for the spread of this strain both in the deltaic and the non-deltaic regions of this state.

With the emphasis in cotton breeding having been shifted to the evolution of long and extra long staple cottons in this country to save the much needed foreign exchange, the objective of the scheme in its extended period from 1956 has been redefined as evolution of a long-linted short duration variety of cotton possessing a mean fibre length of over one inch, a ginning percent of 35 and above and a spinning capacity of 45's H. S. C.

Possibilities of fitting in varieties with short duration and long staple were discussed by Kalyanaraman and Rangaswami (1957). The results of agronomic experiments conducted in the Rice Fallows were also reported by them.

Materials and Methods: Laying stress on a substantial increase in length, ginning and spinning and at the same time retaining the earliness of P 216 F, attempts were made to evolve a suitable strain by selection from among the *hirsutum* material on hand and also by resorting to hybridisation with choice parents. Out of a number of cultures obtained, the all round improvements effected in a set of three cultures viz. 1072-1, a reselection from L. L. 40/51, a long linted strain from the Punjab, 1019-1, a reselection from Coker (U. S. A.) and 1001, a selection from A. C. 75 from the Punjab, from 1955 to 1958 seasons have been critically studied at the Agricultural Research Station, Aduthurai. On the basis of visual scoring, it was observed that they were on a par with the control P 216 F in respect of earliness. Therefore, no further screening for earliness will be possible in these cultures; but they possess better fibre properties than the control and this quality can be utilised with advantage in isolating types with longer lint, at the same time possessing equal earliness. The data gathered from the materials utilised for the study are presented in Table I to III.

Results :

TABLE I.
Yield of *Kapas* in pounds per acre.

S. No.	Season	Culture 1072-1			Culture 1019-1			Culture 1001			P 216 F (Control) Mean Yield
		Culture 1072-1	P 216 F (control)	% on control	Culture 1019-1	P 216 F (control)	% on control	Culture 1001	P 216 F (control)	% on control	
1.	1955-56 ...	838	797	105	960	667	144	824	667	124	710
2.	1956-57 ...	1143	1021	112	817	735	111	653	640	102	799
3.	1957-58 ...	1307	708	185	1519	987	154	1462	989	148	985
	Mean ...	1096	842	130	1090	796	138	980	765	128	801

TABLE II.
Mean fibre length and Mean fibre weight.

Season	Culture 1072-1		Culture 1019-1		Culture 1001		P 216 F (Control)	
	MFL	MFW	MFL	MFW	MFL	MFW	MFL	MFW
1. 1955-56 ...	0.99	0.131	0.96	0.167	0.96	0.149	0.91	0.152
2. 1956-57 ...	0.97	0.144	1.02	0.154	0.94	0.130	0.94	0.153
3. 1957-58 ...	1.04	0.128	1.09	0.127	1.04	0.121	0.95	0.164
Mean ...	1.00	0.134	1.02	0.149	0.98	0.133	0.93	0.156

TABLE III.
Fibre maturity percent.

Season	Culture 1072-1		Culture 1019-1		Culture 1001		P 216 F (control)	
	M.	H. M.	M.	H. M.	M.	H. M.	M.	H. M.
1. 1955-56 ...	72	15	77	13	70	14	62	20
2. 1956-57 ...				— Not tested —				
3. 1957-58 ...	72	20	65	18	64	24	69	16
Mean ...	72	18	71	16	67	19	71	14

Note:— M: Mature H M: Half mature MFL: Mean Fibre Length (inch).
MFW: Mean Fibre Weight
(millionth of an ounce per inch).

It would be seen from the Tables I to III that all the three cultures had given increased yields of *kapas* over P216F for all the three years. The increase in yield of *kapas* was in the range of 48% to 85% in the 1957-'58 season. It may further be stated that this has been achieved without any

sacrifice in the quality of the cultures which, on the other hand, have shown marked improvements in respect of length and fineness. The cultures 1072-1 and 1001 are under purity test awaiting further trials for confirmation on their superiority over P216 F.

In addition, a set of nine more cultures in advanced generations which show great promise in respect of yield, length and fineness is under test (Table IV appended).

It would be seen from the Table IV that all the cultures have given significantly higher yields than P216F, the increase being in the order of 52 to 111%. One culture D. P. L. 15-4-1 has been observed to be pure for all the economic characters and it is under test in the Main Strain Trials for confirmatory evidence on yield.

It is further seen that seven cultures have exceeded one inch in length of which four combine fineness as well. As they combine good maturity and fibre strength, these cultures offer scope for isolating types of economic importance. The all round improvements exhibited by those cultures at Aduthurai during the summer seasons where high temperature facilitating elongation of fibres prevails, clearly indicate that there is ample scope for isolating a long linted type and that the achievement of the objective of the scheme viz., evolution of an early long linted cotton variety to replace P216F, has been more than assured.

Summary: The performance of three promising cultures viz., 1072-1, 1019-1 and 1001 tested in the Rice Fallows Scheme at the Agricultural Research Station, Aduthurai for years 1955-58 has been presented. Besides, out of nine cultures in the advanced stages of breeding, four from the cross (Coker X. A. C. 107) i. e. 1115-1-1-D, 1115-1-3-D; 1115-1-2-B and 1116-3-3-E were noteworthy for their length and fineness, possessing good ginning percent and maturity as well. One selection D. P. L. 15-4-1-A which was pure for all the economic characters (yield, length and ginning) recording high yield as well was advanced to the Main Strain Trial (Yield Trial). It may thus be seen from the performance of the cultures under test in the Rice Fallows Scheme, there is great scope for isolating long-linted types of economic importance.

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REFERENCES

- Kalyanaraman, S. M., and Rangaswami, T. V. 1957 Recent trials on the Introduction of cotton in Rice Fallows in Madras State. *Indian Cotton Gr. Rev.* 11: 285.

TABLE IV.

Summary of performance of promising cultures in the Rice Fallows Scheme Aduthurai during 1957 and 1958 seasons.

Sl. No.	Culture No.	Parentage	Yield of kapas lb. per acre		Ginning Percent	Mean fibre length (inch)	Mean fibre weight (X10 ⁻⁶ oz. inch)	Pressloy strength index lb./mgm.	Maturity percent		Significance for sib-analysis (57-58)				
			Cult. ure	P216F (con-trol)					M	HM IM		Yield	Length		
1.	476-2-3	P216F	1682	987	170	35.8	0.98	0.116	7.66	60	24	16	N	N	S
2.	D. P. L. 15-4-1	D. P. L. 15 (U. S. A.)	1593	803	198	37.9	1.01	0.151	6.86	68	16	16	N	N	N
3.	1115-1-1-D	Coker x A.C. 107	1511	803	188	34.8	1.06	0.139	7.10	73	16	11	—	—	—
4.	1116-3-2	do.	1590	987	152	31.0	1.02	0.125	7.44	78	13	11	N	S	N
5.	362-1-8 F	P216F	1497	708	211	30.8	0.99	0.130	7.65	63	24	13	—	—	—
6.	1116-3-3 E	Coker x A.C. 107	1470	871	169	35.0	1.07	0.129	7.14	63	18	19	—	—	—
7.	1115-1-2 B	do.	1375	803	171	34.3	1.08	0.148	7.53	68	20	12	—	—	—
8.	1115-1-3 D	do.	1361	803	169	34.8	1.05	0.142	7.70	71	14	15	—	—	—
9.	1072-1-1 C	L. L. 40/51	1307	708	185	33.1	1.04	0.128	7.94	72	20	8	N	S	S
	P216F (Control)	—	—	—	—	30.5	0.95	0.164	7.60	69	16	15	N	N	N

Note:— S: Significant N: Not Significant (pure) M: Full Mature HM: Half Mature IM: Immature.

1, 2, 4 and 9: From Compact Family Block Trials. 3, 5, 6, 7 and 8: From Progeny Row Trials.