



Colour cotton research in Mahyco, India

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ABSTRACT

The work on develop naturally coloured cotton commenced at Maharashtra Hybrid Seeds Co. Ltd. (Mahyco, Jalna, India) in 1993. The objectives were the identification of coloured linted cotton hybrids with high yield and superior fiber traits. Colour cotton was grown and used by mankind as long ago as 2500 BC. Damaging effects of synthetic dyes on the ecosystem has led to expanded interest in naturally coloured cotton. Environment conscious communities in developed countries, particularly in Europe and USA are now developing cotton textiles free from harmful dyes and pesticide residues (Anon 1995). "Fox" Fibers coloured cotton have caught the attention of scientists and textile processors; hence the new interest in India. In the study, heterosis for yield and fiber characters of 40 intra-hirsutum hybrid combinations, obtained from crossing colour linted strains as male and elite white linted cultivars as female was evaluated found that the selected hybrid combinations had better fiber properties than the coloured cotton parents. The results indicate that of all the combinations evaluated, the hybrid MBCH-9 with a potential yield of 1800-2000 kg seed cotton per hectare, upper half mean length of 27 - 28 mm, Micronaire of 3.9 - 4.2, fiber strength at 1/8 gauge of 24 – 25 gm/tex, uniformity index of 78 – 80 and light shining brown colour appeared most promising. Improvement in agronomic and technological performance in evolution of colour cotton hybrid will be required for commercial cultivation and the textile industries.

Introduction

Cotton, "White gold," has been an important crop for Indian farmers since time immemorial. It plays a vital role in the national economy, sustaining millions of people directly or indirectly. In nature, cotton fiber is available in colours such as black, mahogany red, red brown, pinkish brown, blue and bright green (Singh *et al.*, 1993). In India coloured cotton like brown, khaki and red were grown in specific areas and utilized in hand spinning and weaving of various fabrics. During the last half century, farmers have not been in favour of growing coloured cotton, basically because of their low yield potential and inferior fiber quality. Fox initiated work on coloured cotton in USA, developing several colour linted genotypes for commercial scale cultivation (Fox, 1987; Anon. 1992). Environment conscious communities in developed countries, particularly Europe and USA, are encouraging the development of cotton textiles devoid of harmful dyes and pesticide residues (Anon, 1995).

Development of Coloured Cotton Hybrids at Mahyco – A Brief Overview

The work on developing naturally coloured cotton was initiated at Maharashtra Hybrid seeds Co. Ltd. (Mahyco), Jalna, India) in 1993. The major objective was the identification of coloured linted cotton hybrids with high yield and superior fiber traits.

A total of 40 combinations using white lint coloured *G. hirsutum* female and brown lint coloured *G. hirsutum* males were tested in trials during 1996-97

and 1997-98. The hybrids exhibited heterosis ranging from 5% to 19% for yield over the white lint check (NHH-44) over the two seasons (Table 1). Three combinations exhibited superiority in yield performance and were either at par or slightly inferior to the check in certain fiber traits.

Conclusions

Hybrids exhibiting high heterotic effect for seed cotton yield and lint colour did not express adequate amount of heterosis for fiber traits. This drawback in development colour linted cotton may be due to tight negative linkage between colour genes and good fiber traits. Earlier workers (Silow, 1944 and Brain, 1950) studied genetics of lint colour. Selected hybrid combinations had better fiber properties than colour cotton parents. Improvement in agronomic and technological performance in colour cotton hybrids will be required for commercial cultivation and use by the textile industry.

Future Needs

Improvement in fiber traits of coloured hybrids by selecting parents with minimum negative linkage between yield and fiber traits.

Identification of environmental effects on the expression of the lint colour.

Development of hybrids with superior performance for yield that are at least on a par with checks for fiber traits.

References

- Anon. (1992): Natural Colours of Cotton. ICAC Recorder. X(4):3-5.
- Anon. (1995): Indian Cotton Mills Federation, Bombay. Report for the year 1994-95, Pp. 37.
- Brain, S.G. (1950): Heritable relationship of brown lints in cotton. Agron. J 42:188-191.
- Fox, S. (1987): Naturally Coloured Cotton – SPIN OFF, Dec. Pp. 48-50.
- Silow, R.A. (1944): The inheritances of lint colour in the Asiatic cottons. J. Genet. 46:78-115.
- Singh, V.V., S.S. Narayanan, V.V. Kulmethe, G.R. Anap and S.N. Nagwekar. (1993): A brief review on coloured lint cotton documenting selected genotypes of *Gossypium hirsutum* L.- J. Indian Soc.Cotton Improv. 18(2):91-95

Table 1. Performance of promising hybrids over two seasons.

Entry	Season	Seed cotton yield (kg/ha)	Increase over check Percent	Mic	UHM (mm)	Strength (gm/tex)	UI (%)	Lint Colour
MBCH-15	K-96	2035	17.99	3.2	24.34	24.18	78	B
	K-97	1955	22.12	4.5	23.15	22.50	77	
Mean		1995	19.38	3.85	23.75	23.34	77.5	
MBCH-9	K-96	2000	15.96	3.9	28.00	25.00	80	LSB
	K-97	1800	12.44	4.2	27.00	24.00	78	
Mean		1900	14.27	4.05	27.50	24.50	79	
MBCH-3	K-96	1788.89	3.72	4.1	27.11	24.48	80	LB
	K-97	1714.81	7.12	4.6	25.17	23.50	79	
Mean		1751.85	5.36	4.35	26.14	23.99	79.5	
(check)	K-96	172469		4.2	26.78	26.55	79	W
	K-97	1600.82		4.7	25.90	24.50	78	
Mean		1662.76		4.45	26.34	25.53	78.5	

Mic- Micronaire, UHMm- Upper half mean length in mm,
 Stren- Strength at 1/8th gauge in Gm/Tex, UI- Uniformity Index, B- Brown,
 LSB- Light Shining Brown, LB- Light Brown, W- White, K- Kharif.