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Performance of Four Candidate Cotton Strains under Central Sindh Conditions

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Abstract: The object of this study was to screen out the best genotype under central Sindh conditions. Four promising advance strains viz., CRIS-2, CRIS-19, CRIS-52 and CRIS-79 were tested against two commercial checks NIAB-78 and CRIS-9. On an average of three years, CRIS-52 ranked first and produced 2671 kg ha⁻¹ seedcotton yield very closely followed by CRIS-19 that yielded 2666 kg ha⁻¹. The increase of top yielding strain CRIS-52 over commercial check NIAB-78 and CRIS-9 was 16.5 and 10.6 % respectively. The lowest yield of 2230 kg ha⁻¹ was produced by NIAB-78. Highest ginning outturn of 34.8 % was given by CRIS-19 and longest staple of 26.4 mm was measured by CRIS-9.

Key words: Cotton, advance strains, environmental conditions, adverse conditions, season effect

Introduction

Agricultural crops behave differently under different environmental conditions. Some adapt readily and perform well under the changed conditions, while the others fail to do so. When varieties are compared under series of environments, the relative ranking usually differ which result difficulty in demonstrating the significant superiority of any variety. The breeders look forward to such varieties, which respond well under varied conditions and preferably under the adverse conditions.

Central Cotton Research Institute, Sakrand is engaged in varietal evolution process considering the various needs of growers, ginners and spinners. Consequently the Institute has evolved a high yielding variety CRIS-9, which was released in 1992 for commercial cultivation in whole Sindh province. In present studies four candidate strains were compared against CRIS-9 and NIAB-78, both commercial varieties consecutively for three years in respect of seedcotton yield kg/ha, ginning outturn percentage and staple length.

Singh *et al.* (1966) conducted a yield trial for three years and found that cotton variety Pramukh gave higher yield than 216 F and 320 F when grown in Utter Pradesh (India). Afzal (1971) emphasized that variety, soil fertility, climatic conditions, insect pest and disease complex all play a part determining the yield. Singh *et al.* (1973) have reported that significant difference in raw cotton yield of American cottons was due to varieties. Litzenoerger (1976) stressed that higher yields were possible from a crop adaptive to climatic and soil conditions. Sharif and Ahmed (1978) stated that there are two major factors for determining the yield of any crop specie (a) genetic make-up (b) environmental factors and their interaction. Soomro and Memon (1979) studied the effect of site and season on yield and ginning outturn percentage in desi cotton. They recorded highly significant difference in yield due to varieties and year components but found significant difference in ginning outturn due to varieties only.

Gupta and Katiyar (1980) reported highly significant seasonal effects on seedcotton yield, number of bolls per plant, boll size and staple length due to significant genotype x environment interaction component. Ahmed *et al.* (1982) obtained highly significant difference in yield of upland cotton due to variety, location and year components. Meredith (1984) reported highly significant seasonal effects on seedcotton yield, number of bolls per plant, boll size and staple length due to significant genotype x environment interaction component. Soomro *et al.* (1986) reported significant differences in yield, ginning outturn

percentage and staple length for varieties, location and years. Khan *et al.* (1989) observed significant difference in yield, ginning outturn percentage and staple length for varieties and years, while variety and year interaction remained non-significant in upland cotton experiments. In present studies four candidate strains were compared against CRIS-9 and NIAB-78 both commercial varieties consecutively for three years in respect of seedcotton yield kg ha⁻¹, ginning outturn percentage and staple length.

Materials and Methods

Four promising strains viz., CRIS-2, CRIS-19, CRIS-52 and CRIS-79 were tested consecutively for three years (1994, 1995 and 1996) against two commercial varieties NIAB-78 and CRIS-9 at the experimental farm of CRI, Sakrand to screen out the best genotype under Central Sindh conditions. The design of experiment during all the three years was randomized complete block with four replications. The data regarding seedcotton yield, ginning out-turn percent and staple length were collected and subjected to Duncan's New Multiple Range Test to bring out the statistical difference among strains and commercial checks.

Results and Discussions

The data of seedcotton yield, ginning out-turn percent and staple length are presented in Table 1, which reveal that during 1994, CRIS-52 was the top yielding variety with 2184 kg ha⁻¹ seedcotton followed by CRIS-79 (2145 kg ha⁻¹). CRIS-19 produced the lowest yield of 1714 kg ha⁻¹. During 1995 cotton season, CRIS-19 ranked first and produced 3492 kg ha⁻¹ seedcotton yield, while CRIS-52 ranked second with 3157 kg ha⁻¹ and CRIS-79 ranked third (3062 kg ha⁻¹). The lowest yielding variety was NIAB-78 that produced 2583 kg ha⁻¹ of seedcotton. In the year 1996, again CRIS-19 excelled all other strains and commercial checks by producing 2791 kg ha⁻¹ seedcotton yield followed by CRIS-52 (2671 kg ha⁻¹) and commercial checks by producing 2791 kg ha⁻¹ seedcotton yield followed by CRIS-52 (2671 kg ha⁻¹) and CRIS-79 (2551 kg ha⁻¹). CRIS-19 during its first year of test yielded lowest but then consecutively ranked first for next two years. This may be due to low plant population of CRIS-19 during first year.

On an average, CRIS-52 surpassed all the strains and commercial checks and produced 2671 kg ha⁻¹ followed by CRIS-19 that produced 2666 kg ha⁻¹ of seedcotton. But

Table 1: Performance of four advance strains against two commercial checks at CCRI Sakrand during the year 1994, 1995 and 1996

Year	Strains	Seedcotton yield (kg ha ⁻¹)	Ginning outturn (%)	Staple length (mm)
1994	CRIS-2	1989	34.0	25.4
	CRIS-19	1714	35.2	26.2
	CRIS-52	2184	35.9	26.4
	CRIS-79	2145	36.2	25.2
	CRIS-78	1795	34.2	25.7
1995	CRIS-9	1989	34.9	27.7
	CRIS-2	2727	32.4	25.8
	CRIS-19	3492	34.0	25.3
	CRIS-52	3157	31.9	25.5
	CRIS-79	3062	29.6	25.1
1996	CRIS-78	2583	32.7	25.9
	CRIS-9	2822	33.6	25.4
	CRIS-2	2223	33.2	26.6
	CRIS-19	2791	35.1	26.5
	CRIS-52	2671	33.0	25.8
Average of three years	CRIS-79	2551	33.0	25.5
	CRIS-78	2312	34.5	26.5
	CRIS-9	2352	35.6	26.0
	CRIS-2	2317 c	33.2 bc	25.9 b
	CRIS-19	2666 a	34.8 a	26.0 b
Average of three years	CRIS-52	2671 a	33.6 b	25.9 b
	CRIS-79	2586 b	32.9 c	25.3 c
	CRIS-78	2230 d	33.8 b	26.0 b
	CRIS-9	2388 c	34.7 a	26.4 a

Means followed by similar letters do not differ significantly from each other according to DMR Test.

statistically both the strains were of same order. Significantly lowest yield was given by NIAB-78 (2230 kg ha⁻¹) followed by CRIS-2 (2317 kg ha⁻¹). Significantly highest ginning outturn of 34.8% was given by CRIS-19 followed by CRIS-9 (34.7%) but the two strains were of the same group. The lowest ginning outturn of 32.9% was recorded by CRIS-52 the highest yielding variety. As regards staple length, significantly longest staple of 26.4 mm was measured by CRIS-9 followed by NIAB-78 and CRIS-19 (26.0 mm).

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