the traits. SSV 714 recorded significant for green stalk yield 81.8 t/ha and grain yield 2245 kg/ha but non significant for extractable juice yield (14604 lit/ha) and jaggery yield (712 kg/ha). The total duration of the cultivar *viz.*, IS 6962, HES 4 and SSV 714 ranged from 170 to 190 days.

Based on the total yield over two cuts the performance of IS 6962, HES 4 and SSV 714 appeared promising since these cultivars showed good performance in respect of green stalk yield (55.4 to 90.0 t/ha), juice yield (14604 to 19176 lit/ha), jaggery yield (712 to 1011 kg/ha) and grain yield (1653 to 3628 kg/ha). Bapat *et al.* (1984) reported that above traits are helpful in identifying and in the selection of promising sweet stemmed sorghum varieties.

In the major sorghum growing districts of Tamil Nadu, it will be possible to divert 50 per cent of irrigated sorghum area for raising sweet stemmed sorghum and establish small processing units having crushing capacity of 500 to 1000 t/day in rural areas. The syrup and jaggery can also be marketed locally. The grains of sweet stemmed sorghum cultivars are mostly pearly white, medium bold and fit for household consumption and will fetch additional income to the growers.

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CORRELATION AND PATH-COEFFICIENT ANALYSIS IN GREEN GRAM (*Vigna radiata*).

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ABSTRACT

An experiment with 16 green gram genotypes was conducted to study the association and path coefficients of different characters with seed yield. Pods per plant and 100 seed weight had significant and positive correlation with seed yield. Positive direct effects were observed for pods per plant, plant height and 100 seed weight, hence selection based on these characters would bring improvement in seed yield in green gram.

Seed yield is a complex character, highly influenced by environment. Selection based on yield is not effective, hence selection on yield components, which are less prone to environmental influences is very valuable (Ramana and Singh 1987). The present study was conducted to identify different yield components through which seed yield can be increased in green gram.

MATERIALS AND METHODS

Sixteen genotypes of green gram were sown in randomised block design with three replications during *kharif* 1989 at the Regional Agricultural Research Station, Jagtial. Each genotype was sown in 6 rows of 5m length with a row to row spacing of 30cm and plants spaced at 10cm apart within the row. All package of practices were followed as per recommendations. Data on seven characters *viz.*, days to flowering, days to maturity, pods per plant, plant height, pod length, 100 seed weight and seed yield per plant were recorded and genotypic and phenotypics correlations were estimated (Robinson *et al.*, 1951). The direct and indirect effects of components of six characters on seed yield were estimated by path coefficient analysis following the method of Dewey and Lu (1959).

RESULTS AND DISCUSSION

In general, the genotypic correlations were greater than the corresponding phenotypic correlations, indicating the preponderance of genetic variance in expression of different characters (Table 1) (Malik *et al* 1981). Positive and significant association of seed yield was

Table 1. Genotypic and Phenotypic correlation coeffecients of various characters in green gram.

Characters		Days to maturity	Pods per plant	Plant height	Pod length	100 seed weight	Seed yield
Days to flowering	P	0.5887**	0.3741	0.4338**	0.1288	0.2069	0.1129
	G	0.6656	0.4781	0.8646	0.2255	0.2229	0.2623
No of pods/plant	P		0.5459**	0.6327**	0.3239	0.0580	0.0403
	G		0.6770	0.9955	0.3926	0.0701	-0.0703
Days to maturity	P			0.4028*	0.2452*	-0.0458	0.2349*
	G			0.5495	0.6606	-0.0878	0.5312
Plant height	P				0.1762	0.0927	0.2759
	G				-0.0785	0.1705	0.2718
Pod length	P					0.3363*	0.1514
	G					0.5911	-0.0191
100 - seed weight	P						0.2184*
	G						0.5322

* Significant at 5% level ** Significant at 1% level.

Table 2. Genotypic path analysis with yield.

Characters	Days to flowering	Days to maturity	Pods per plant	Plant height	Pod length	100 Seed weight	Correl. yield
Days to flowering	-1.08	-2.12	1.56	1.85	-0.36	0.42	0.26
Days to maturity	-0.72	-3.19	2.21	2.13	-0.63	0.13	-0.07
Pods per plant	-0.52	-2.16	3.26	1.18	-1.07	-0.16	0.53*
Plant height	-0.93	-3.18	1.79	2.14	0.13	0.32	0.27
Pod length	-0.24	-1.25	2.15	-0.17	-1.61	1.11	-0.02
100 - seed weight	-0.24	-0.22	-0.29	0.37	-0.95	1.87	0.53*

Residual effect = 0.0358

observed with Pods per plant (Misra and Sahu, 1985) and 100 seed weight (Kumari and George, 1985). Non significant association with seed yield was observed for days to flowering, plant height, days to maturity and pod length. Significant positive association between days to flowering with days to maturity and plant height and pods per plant with plant height, days to maturity and pod length and 100 seed weight with pod length was observed. From the above results it is evident that pods per plant and 100 seed weight are the only characters through which improvement in yield could be obtained.

Pods per plant showed highest direct effect on seed yield (Table 2) as reported by Misra and Sahuy, (1985), and its indirect effect on seed yield through other characters was negative except plant height, which showed positive indirect effect. Plant height and 100 seed weight also showed positive direct effect on seed yield. All the characters which showed positive direct effect also showed positive correlation with seed yield. Negative direct effects on seed yield were depicted by days to flowering, days to maturity and pod length. The residual effect was low (0.0358) indicating that most of the yield attributes were taken into consideration.

From the present study it is evident that improvement in seed yield in green gram could be brought through selection of component characters like pods per plant, 100 seed weight and plant height which showed positive direct effect on seed yield.

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COMBINING ABILITY STUDIES FOR QUANTITATIVE CHARACTERS IN COTTON (*Gossypium hirsutum*).

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ABSTRACT

In a combining ability analysis of 40 F_1 hybrids developed by line X tester method in cotton, non-additive gene action was predominant for all the seven quantitative characters, *viz.*, plant height, number of internodes, first sympodia emergence, number of sympodia per plant, number of bolls per plant, boll weight and seed cotton yield. Half X Half, CRH-68 and Laxmi among the pollen parents, proved to be the best general combiners and Kampala X MCU - 7 among the hybrids recorded the best specific combining ability effect for most of the characters studied. The crosses involving these parents should provide potential breeding material for further exploitation through selection.

KEY WORDS : *Gossypium hirsutum*, Combining ability, Quantitative Characters.

For a systematic breeding programme, it is essential to identify parents as well as crosses which could be exploited to bring about further genetic improvement in both yield and its related components. Line X tester approach proposed by Kempthorne (1957) is the most convenient model to test a large number of genotypes for their combining ability. Accordingly, the present study was undertaken to have an insight into the nature of combining ability for yield and its related characters in selected cotton genotypes.

MATERIALS AND METHODS

Fifty four genotypes comprising ten ovule parents (Acala hopi, Gregg, Hancock, Half X Half, Rex, Bobdel, Reba-B50, Kampala, CRH-68 and Laxmi), four pollen parents (MCU-5, MCU-7, MCU-9 and LRA-5166) and forty F_1s obtained by combining the above parents were grown in randomised block design with three replications at the Cotton Breeding Station, Tamil Nadu Agricultural University, Coimbatore during summer, 1990. Each genotype was raised in single row of 4.5 m length in each replication. A spacing of 75cm between rows and 30cm between plants was adopted. Data were recorded from five randomly selected competitive plants in each plot for quantitative characters, *viz.*, plant height, boll weight and seed cotton yield per plant. The data were subjected to analysis of variance based on the line X tester model (Kempthorne, 1957).

Table 1. Analysis of variance

Source	df	Mean sum of squares						
		Plant height	No. of internode per plant	First sympodial emergence	No. of sympodia per plant	No. of bolls per plant	Boll weight	Seed cotton yield/plant
Replication	2	241.27**	37.74*	0.14	53.57**	11.40	0.08	4.60
Treatment	53	195.93**	20.22	0.73	10.22	14.10**	0.39**	156.57**
Error	106	63.69	8.30	0.59	8.39	6.43	0.17	8.65
GCA		9.52	0.03	0.0006	0.04	0.03	0.002	0.29
SCA		25.36	0.21	0.18	1.14	3.09	0.02	53.24
GCA : SCA		0.37:1	0.14:1	0.003:1	0.03:1	0.009:1	0.10:1	0.005:1

*, ** Significant at 5% and 1% respectively.