Fibres of second and third pickings were significantly stronger than those of first picking (Table 2). This might be due to the presence of more immature fibres in later pickings since the effect of immature fibres is to increase the values of bundle tenacity.

It is evident from the above discussion that picking intervals had highly significant effect on fibre quality. Mean fibre length, bundle tenacity and fineness of fibres increased while maturity decreased in the second picking as compared to first picking. similar trends continues in the third picking except for mean fibre length which decreased (Table 1). The differences in fibre quality between pickings might have been due to several environmental and genetical factors. Moreover, bolls formed early in the season would get more nutrition than bolls formed later.

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COMBINING ABILITY STUDIES THROUGH L X T ANALYSIS FOR SEED CHARACTERS IN COTTON (*G.hirsutum* L.)

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ABSTRACT

The combining ability for seed characters in cotton was estimated in a 'line' X tester' analysis, involving seven lines of *G.hirsutum* (differing in grades of fuzz) and four varieties as testers. Both additive and non-additive gene action was observed for fuzz grade, single seed weight, single seed coat weight and single seed kernel weight. Crosses recording high sca effects (in the desired direction) involved parents with high x high or low x low gca effects. The parents (lines) TCH 89/7 (naked seed) is a good combiner for fuzz grade, single seed coat weight and single seed kernel weight; TCH 65/8 (sparsely fuzzed) for fuzz grade, single seed weight and single seed kernel weight, and TCH 96/6 for single seed coat weight. And among testers MCU 5 is a good combiner for single seed weight and single seed kernel weight; MCU 7 for single seed coat weight and LRA 5166 for fuzz grade.

The decisions on the choice of a suitable breeding approach for improvement of any character depends upon the genetic control of a character under study. The present study was undertaken to obtain information on general and specific combining ability effects on four seed characters such as fuzz grade, single seed weight, single seed coat weight, single seed kernel weight, in cotton through a line x tester analysis (Kempthorne, 1957). This helped for devising efficient breeding methodology for effecting genetic improvement on seed characters.

MATERIALS AND METHODS

The experimental material comprising of seven lines differing in fuzz grades such as fully fuzzed (CTCH(63/1, TCH 63/4, TCH 104/1, and TCH 70/7), sparsely fuzzed (TCH 65/8 and TCH 96/6) and naked (TCH 89/7) as females. And four testers namely, MCU 5, MCU 7, MCU 9 and LRA 5166 as males, the crosses were effected during 1989 (Winter) in a line x tester model. All the F_1 s of the 28 crosses along with the parents were raised in a randamised block design with three replications. And each entry represented by a single row of ten plants spaced 30 cm apart. The data were recorded on five plants taken randomly per row for fuzz grade using (Hutchinson and Ramaiah, 1938) grade chart on fuzzgrade.

Single seed weight was taken using an Electronic balance. After spliting open the single seed by a sharp razor and thumb, single seed coat weight and single seed kernel weights were taken separately.

Table 1. General combining ability effects of parents for different characters.

Parent	Characters			
	Fuzz grade	Single seed weight	Single seed coat weight	Single seed kernel weight
LINES				
TCH 63/1	0.03	-4.71*	-1.24*	-2.18*
TCH 63/4	-0.02	-0.71	-1.77*	-1.32*
TCH 104/1	0.06	-1.46*	0.01	-2.80*
TCH 65/8	-0.14*	6.90*	2.01*	2.89*
TCH 96/6	-0.27*	-1.03*	-0.54	-0.59
TCH 70/7	0.65*	2.90*	1.48	1.26*
TCH 89/7	-0.31*	-1.88*	0.05	2.75*
TESTERS				
MCU 5	0.01	3.77*	1.00*	2.41*
MCU 7	-0.001	-0.69*	-1.42*	-0.49*
MCU 9	0.001	-2.20*	0.15	-0.09
LRA 5166	-0.04	-0.88*	0.27	-1.82*
SE (lines)	0.024	0.30	0.33	0.34
SE (testers)	0.018	0.23	0.25	0.26

* Significant

Table 2. Specific combining ability effects of hybrids for four seed characters.

Crosses			Fuzz grade	Single seed weight	Single seed coat weight	Single seed kernel wt.
MCU 5	X	TCH 63/1	-0.45*	7. 19*	4.89*	3.00*
"	X	TCH 63/4	0.14*	-2.22*	-5.94*	-3.94*
"	X	TCH 104/1	0.47*	-1.76*	-4.38*	1.61
"	X	TCH 65/8	-0.01	-6.37*	-0.66	-5.22*
"	X	TCH 96/6	-0.02	-5.95*	-3.79*	-1.44
"	X	TCH 70/7	-0.22*	-3.11*	2.03*	-2.08
"	X	TCH 89/7	0.15*	12.22*	8.05*	8.07*
MUC 7	X	TCH 63/1	-0.26*	1.58	3.58*	-0.14
"	X	TCH 63/4	-0.16*	1.52	2.86	0.42
"	X	TCH 104/1	0.01	3.76*	2.01*	2.45*
"	X	TCH 65/8	0.26*	0.09	-1.60	3.71*
"	X	TCH 96/6	0.02	1.19	1.44	-1.16
"	X	TCH 70/7	-0.003	2.40	-4.26*	-1.75
"	X	TCH 89/7	0.07	-10.55*	-4.03*	-4.52
MCU 9	X	TCH 63/1	0.27*	-3.25*	-2.69	0.23
"	X	TCH 63/4	-0.12	3.45*	4.22*	3.16*
"	X	TCH 104/1	-0.27*	3.12*	2.23*	3.00*
"	X	TCH 65/8	-0.03	2.88*	2.19*	2.55*
"	X	TCH 96/6	-0.05	6.10*	2.89*	1.54
"	X	TCH 70/7	0.21*	-3.87*	-2.53*	-1.11
"	X	TCH 89/7	0.001	-8.42*	-6.33*	-9.38*
LRA 5166	X	TCH 63/1	0.44*	-5.53*	-5.58*	3.09*
"	X	TCH 63/4	0.13	-2.75*	-1.14	0.37
"	X	TCH 104/1	-0.27*	-5.12*	0.13	-7.06*
"	X	TCH 65/8	-0.15*	3.40*	0.06	-1.04
"	X	TCH 96/6	0.06	-1.34	-0.55	0.06
"	X	TCH 70/7	0.01	4.58*	4.76*	4.95*
"	X	TCH 89/7	-0.23	6.76*	2.31*	5.83*
SE			0.05	0.60	0.65	0.69

* Significant

RESULTS AND DISCUSSION

The analysis of variance for combining ability revealed significant differences for general combining (gca) effects among parents as well as for specific combining ability (sca) effects among the hybrids for all the seed characters studied. The gca effects of seven parents and sca effects of 28 hybrids are presented in Table 1 and Table 2.

Highly significant gca effects in the negative (desired) direction for fuzz grade were recorded by sparsely fuzzed lines (TCH 65/8 and TCH 96/6) and naked seed line (TCH 89/7 indicating additive gene action. Eight out of 28 crosses, recorded significant and negative sca effects. The parents TCH 65/8, TCH 96/6 and TCH 89/7 involved as one of the parents in most of the crosses.This indicated that the naked and sparsely fuzzed parents have potentially of getting less fuzz to naked seed formation and this should be taken advantage to produce less fuzzy seeds, which is having the advantage of harbouring less seed borne pathogen than the fuzzy seeds, and does not need acid delinting.

Significant and positive gca effects were observed in the lines TCH 65/8 and in the tester MCU 5, suggesting that these parents have genes which are additive in nature for single seed weight. Ten hybrids out of 28 crosses showed significant and positive sca effects, and the maximum significant positive sca effects, and the maximum significant positive sca effect of 12.22 was recorded by the cross MCU 5 X TCH 89/7. These hybrids involved atleast one parent with good or average general combining ability. The high sca effects in these crosses might be due to additive X additive gene interaction.There are good chances of isolating desirable segregants from these crosses in

segregating generations because of fixable nature of gene interactions.

The gca effects of TCH 63/1, TCH 63/4 and TCH 96/6 among lines and MCU 7 among testers were significant and in negative (desired direction). Nine out of 28 crosses have recorded significant and negative sca effects. And the cross MCU 9 X TCH 89/7 has recorded the highest negative sca effects of -6.33, which involves both the parents has recorded low gca effects but showed high negative sca effects indicating additiveness.

Among lines a positive significant gca effects was noted in TCH 65/8, TCH 70/7 and TCH 89/7. Among testers MCU 5 has recorded significant and positive gca effects for single seed kernel weight. Maximum significant and positive sca effects of 8.07 was recorded by the cross MCU 5 X TCH 89/7 in which both the parents are having positive significant gca effects indicating additive gene action. The parents TCH 104/1 and MCU 7 with negatively significant gca effects, produced a hybrid with positively significant sca effects, which might be due to non additive gene effects.

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LODGING OF SOYBEAN GENOTYPES IN UNDERSTOREY OF COCONUT PLANTATIONS

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ABSTRACT

Experiments were simultaneously conducted at the Tamil Nadu Agricultural University, Coimbatore with fifteen soybean genotypes in three environments to study the lodging pattern and to identify the lodging resistance or susceptability of soybean genotypes for appropriate use in various cropping systems. Soybean plants lodged severely within two coconut stands due to shade effect. The mean lodging per cent was 83.9 and 95.3 under eight and eighteen year old coconut plantations, respectively. The variety Hardee and Monetta recorded very low (less than 10 per cent) lodging percentages under eight year old coconut plantation. Besides these UGM 21 recorded low lodging per cent under eighteen year old coconut plantation which showed their shade tolerance.

Generally short statured intercrops or understorey crops are lodged depending on the shade intensity. Crop cultivars/cultures may differ in lodging behaviour under similar shade environment. Information on crop lodging of component crops is limited.

The present investigation was carried out to study the lodging pattern of soybean genotypes in understorey of coconut plantations and identification of lodging resistance or suceptibility of genotypes for appropriate use in various cropping systems.

MATERIALS AND METHODS

The experiments were conducted at the Tamil Nadu Agricultural University, Coimbatore, India. Fifteen soybean genotypes were grown simultaneously in open field and understorey, i.e., raising of a crop under the canopy of plantations of eight and eighteen year old coconut plantations during March-June season. The experiments were conducted in a randomised block design with three replications. The coconut spacing was 6.0 m x 5.0 m in eight year and 6.0 m x 6.0 m in eighteen year old coconut plantation. In the present study the lodging aspect was investigated within the two coconut stands, the open field being excluded since under open field condition, no lodging was observed.

RESULTS AND DISCUSSION

Several genotypes had comparable lodging trait. Soybean plants lodged severely within two coconut stands due to shade effect. The mean lodging per cent was 83.9 and 95.3 under the eight