

ABSTRACTS

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Assessment of genetic make-up of a population in cotton (*Gossypium arboreum* L.)

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ABSTRACT : The nature and magnitude of combining ability effects in 108 crosses of cotton (*Gossypium arboreum* L.) involving 6 testers and 18 lines were studied for six characters. The additive genetic component was important for seed cotton yield, boll number, boll weight while both additive and non-additive components of genotypic variation were involved in the genetic control of halo length, ginning outturn and plant height. LD 210 was best general combiner tester while AC₂, H 493, H 451, 875, H 482 and H 468 were promising lines. There is no relationship between the specific combining effects and the *per se* performance of parents involved in a particular cross. The relevant breeding procedures for the improvement of this population have also been suggested.

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Effects of disruptive selection on technological characters in upland cotton

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ABSTRACT : Three cycles of disruptive mating and selection from F₂ onward in H4 and JKHY1 and 2 cycles in CICR HH1 released vast genetic variability and transgressive segregants for 2.5% span length, uniformity ratio, fibre fineness, maturity coefficient and fibre strength in the progenies of these populations. Disruptive selection proved to be an efficient method in improving technological characters in upland cotton.

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Association of main stem leaf area at various stages with productivity of four hirsutum cottons under semi-arid environment

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ABSTRACT : Removal of main stem leaf area (MSL) at square formation peak flowering and bolling significantly reduced seed cotton yield by 31.4, 21.4 and 17.1% over non-defoliated control, respectively irrespective of variety tested along with reduction in boll number/plant. Removal of MSL at all stage increased transpiration rate in variety DHy-286 and SRT-1 with no change in variety, L-147 and PKV-0442. Relative water content increased in later two varieties at all stages by 2 to 28% relative to control while in former (DHy-286 and SRT-1), it was increased considerably at boll development. Total leaf area was strongly associated with yield ($r=0.496$) and boll number ($r=0.62$) in the variety L-147 and PKV-0442.

This association was not significant in case of varieties DHy-286 and SRT-1. Removal of MSL at any stage, thus is not beneficial in yield improvement in hirsutum cottons.

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Soybean genotypes for intercropping with cotton variety vikram

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ABSTRACT : The yield of seed cotton was reduced when intercropped with soybean. However, the lowest reduction in cotton yield to the tune of 8.36 and 9.30% was recorded due to intercropping with JS-71-5/SS 2 and JS-78-53, respectively as compared to the highest (33%) reduction with soybean variety JS-78-80. The highest estimate of additional net income of Rs. 521.5 and Rs. 514.75/ha was found with soybean varieties JS-71-5/SS 2 and JS-78-53, respectively, as compared to the sole crop of cotton. Thus, cotton+soybean intercropping was found to be beneficial in terms of net additional return, with suitable soybean variety only.

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Possibilities of commercial exploitation of cotton hybrids in north india-boll setting pattern*

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ABSTRACT : The present investigation was carried out at Haryana Agricultural University, Hisar, during **kharif** 1982, aimed at to study the boll setting pattern in cotton hybrids. Average boll setting pattern in cotton hybrids revealed that under north Indian agro-climatic conditions boll formed during 15th August to 30th September contributed considerably to total cotton yield. Hybrids utilized longer duration for boll setting as compared to standard variety H-777.

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Performance of a new synthetic pyrethroid fenprothrin against bollworms-complex of *Arboreum* cotton

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ABSTRACT : A new synthetic pyrethroid, fenprothrin (Meothrin 10 EC) was evaluated at three dosages against bollworms-complex on **desi** (cotton *G. arboreum* L.) variety LD 230 keeping fenvalerate (0.05 kg a.i./ha) and flucythrinate (0.05 kg a.i./ha) as standard. The mean loculi infestation due to bollworms and seed-cotton yield when averaged over three locations viz., Ludhiana, Jalandhar and Kheri with 0.1 kg a.i./ha fenprothrin was at par with flucythrinate although more effective than fenvalerate. The loculi infestation with 0.075 kg a.i./ha dose was 7.0% against 6.4, 8.1 and 26.7% with flucythrinate, fenvalerate and untreated control, respectively. Similarly, average yield of seed-cotton obtained was 1556 kg/ha (151.8% increase over control) against 1603 kg/ha with flucythrinate (159.4% increase over control) and

1555 kg/ha with fenvalerate (151.6% increase over control). This dose was at par with both the standards. The lowest dose 0.05 kg a. i./ha fenprothrin proved inferior to both the standards.

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Differential responses of chloride and sulphate forms of Cu, Mg and Ca in chlorophyll retention and membrane permeability of upland cottons

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ABSTRACT : Thirty discs (0.5 cm in diameter) of fresh leaves of two *hirsutum* varieties of cotton (L-147 and Dhy-286) and hybrids (H-4 and Varlaxmi) were tested for relative efficacy of sulphate forms of Cu, Mg and Ca (100 ppm) to determine their role in chlorophyll retentive efficiency *in vitro* conditions. Varieties and hybrids differed in response. Sulphate forms of Ca and Mg were found better in varieties while chloride of Mg and Cu had better efficacy in hybrids for higher chlorophyll retention. Copper in any form delayed yellowness of leaf discs in both groups. MgCl₂ and CuSO₄ increased leakage of electrolytes by increasing the cell permeability. Copper increased the cell permeability for K. Sodium leakage was considerably arrested by sulphate and chloride forms of Ca. In general, sulphate form of Ca was better for L-147 while Mg was found better for Dhy-286. Chloride form of Mg was efficient for H-4 and Cu was efficient for Varlaxmi in retentive capacity of chlorophyll and deferral of leaf senescence.

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Influence of Leaf-Veins on ovipositional behaviour of Jassid, *Amrasca biguttula* (Ishida)*

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ABSTRACT : The ovipositional behaviour of jassid was studied at Indian Agricultural Research Institute, New Delhi. Field population of jassid eggs ranged from 5 to 22 and 3 to 114/leaf on cotton and okra genotypes, respectively. Eggs distribution in leaf-veins of different cotton genotypes was 0.6 to 7.0, 8.5 to 27.8 and 4.9 to 21.9 eggs/leaf in main-vein, lateral-veins and sub-veins, respectively. Correspondingly in okra it ranged from 0.9 to 13.7, 0.5 to 46.3 and 7.8 to 105.7. Hair density and hair length of main-vein only had significantly negative correlation with the number of eggs laid. Thickness of all category of veins had positive correlation with egg laying in both crops. Mean number of eggs laid (0.3 to 4.1/vein) in sub-veins of okra was comparable (1.4 to 4.6/vein) with lateral-veins of cotton and these veins shared the major population of jassid eggs. Thicknesses of these veins appeared to be lowest in eliciting suitable ovipositional preference in jassid femals. Susceptible genotypes carried more number of eggs when compared to resistant ones in both crops.

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Combining ability for quality characters in upland cotton

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ABSTRACT : The female parent namely 5143 C was found to be the best combiner for halo length, seed index, lint index and fibre fineness. Cocker 100 proved to be the best male combiner for halo length, ginning outturn and lint index. Ratio of gca revealed that additive generation involved in the inheritance of all the quality characters viz., halo length, lint index, seed index, G. O. T. and fibre fineness. In general, it was observed that under normal fertilizer dose good results were obtained for quality characters. Suitable breeding methodology to improve quality characters in cotton has been suggested.

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Use of genetic and cytoplasmic male sterility for developing cotton hybrids

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ABSTRACT : Cheaper cotton hybrid seed production is feasible using stable genetic and cytoplasmic-genetic male sterility system. Certain intrahirsutum male sterile cotton hybrids viz., JICH-4 and JICH-2, developed and evaluated at Indore appeared to be promising with regard to fibre qualities, low incidence of new wilt and potential for higher productivity.

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Pattern of variation in boll weight of sympodial branches in upland cotton (*Gossypium hirsutum* Linn.)

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ABSTRACT : Analysis of bolling on sympodial branches of the main stem in upland cotton (*Gossypium hirsutum* Linn.) cv. 'H-777' revealed that boll number and weight decrease linearly with increasing position of the sympodial branch (from base upwards). Similar patterns were discernible for weight of bolls located on first and second nodes of the sympodial branch. However, the bolls on the third node indicated curvilinear relationship, while the bolls on the fourth node did not suggest of any such regular pattern.

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Effect of the preceding crops and levels of nitrogen on the growth and yield of cotton

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ABSTRACT : Field experiment were conducted to assess suitability of different crops grown in rotation with cotton and also to determine its nitrogen requirement. The yield of cotton in the unmanured plots in rotation with **berseem**, pea, **bakla**, gram and **raya** were 55.5, 36.7, 31.2, 25.7 and 11.9%, respectively; higher over cotton following wheat. The net returns, however, were in the order pea-cotton>gram-cotton>**berseem**-cotton>**bakla**-cotton>**raya**-cotton, and lowest in wheat-cotton rotation. The application of nitrogen levels increased height, internode number, boll number and boll weight and delayed the maturity of cotton in all sequences. The nitrogen requirement of cotton was found to be highest after wheat and lowest after leguminous crops, and was economical at all levels of nitrogen from 40-120 kg/ha.

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Use of phrethroids on cotton

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ABSTRACT : In all the cotton growing areas of India, pyrethroids have proved their worth as potent insecticides for control of bollworms. In the growing region of Madhya Pradesh too, pyrethroids gained enormous popularity. Since last couple of years, pyrethroids have been widely used in mixture with other pesticides. Application of Decis in mixture with Rogor and then Sumicidin in mixture with Rogor resulted in some clearcut physiological differences in plants viz., early bursting of boll and higher percentage of wilting (drying) of plants and higher aphid population.

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Economic threshold for spray initiation against cotton bollworms on *Arboreum* varieties

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ABSTRACT : Studies conducted for chemical control of bollworms on *arboreum* varieties LD 230 and G 27 sown on different dates revealed that spray initiated when 25 per cent plants were in squaring proved better than the fixed period, i. e. last week of July. The new spray initiation criterion not only lowered loculi damage and reduced stained **kapas** but increased seed-cotton yield also for the crop sown in April. The two criteria were equally effective when the crop was sown in May and it resulted in the saving of one insecticidal application for crop sown upto end May.

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Toximetric studies of stable bleaching powder on *Xanthomonas campestris* pv. *malvacearum*

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ABSTRACT : Inhibitory effect of Stable Bleaching Powder, **SBP** (Calcium hypochlorite, 35% chlorine) on *Xanthomonas campestris* pv. *malvacearum* (smith) Dye could be tested effectively by Colony Count Method, Turbidity Method, Seed Placement Method, Cup Plate Method and Poisoned Food technique. A positive correlation between concentrations in relation to per cent growth inhibition and increase in area were observed indicating thereby increased inhibition with the increase in concentration of SBP.