ABSTRACTS
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Petiole photosensitivity of newly evolved interspecific cotton strains to sun angle and its effect on light interception

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ABSTRACT : Phototropic movements were noticed in two of the interspecific strains (*Gossypium hirsutum* x G. anomalum L. designated as HIRANO) grown at Cotton Research Unit, Punjabrao Krishi Vidyapeeth, Akola (22^0 N at 77.4^0 E longi., 307 m above sea level. This tropism was independent of soil moisture. Light interception by horizontal (Planophyll) and erect type (Erectophyll) strains (HIRANO-1 and HIRANO-2) was measured with Solar Monitor (LICOR-1776, USA) under field and simulated conditions in a laboratory. There was significant increase in light interception by 6.02% in erect type strain (HIRANA-2) when compared with strain having horizontal leaves. There was an increase in daily light interception by plant type with erect leaf (HIRANO-2) by 5.4 to 16.4, 5.8 to 19.7, 3.5 to 12.2 and 3.3 to 5.1% in 4, 5, 6 and 7th leaf from top respectively under simulated conditions of physical constants against planophyll type. It could be suggested that the new strain HIRANO-2 was potential to harvest greater solar radiation under irrigation and rainfed conditions and this erectophyll character appears beneficial for improvement of crop growth rate in upland cotton.

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Genetic analysis of quantitative characters in deshi cotton (*G. herbaceum L.*)

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ABSTRACT : Eight genotypes of *G. herbaceum* L. cotton and their all possible crosses (excluding reciprocal) were tested by the diallel analysis (Hayman, 1954) at the M.C.R.S., GAU; Surat during 1983-84. The analysis of variance showed that the genotypes were significantly different from each other. The estimates of genetic parameters revealed that the assumptions for the diallel were valid by the non-significant t^2 values for all characters. D was significant and greater than H_1 for G. P. and mean fibre length. H_1 was greater in magnitude than H_2 for yield and G. P. For these two characters F was significant and positive suggesting excess of dominant alleles in the parents. Heritability was low only for seed cotton yield. Excess dominance was also revealed from the ratio KD/KR for both seed cotton yield and G. P.

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Effect of foliar sprays of new aromatic nitro compound (Atonik) and Antitranspirant (Kaoline) applied singly and in combination on seedling growth, physiology and yield of hirsutum cotton under semiarid environment

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ABSTRACT : Effect of foliar sprays of new aromatic nitro compound (Atonik-1000 ppm) and antitranspirant (Kaoline 1.25%) were tested on hirsutum cotton (Dhy-286) under rainfed conditions during 1982-83 and 1983-84 in Vidarbha region. Laboratory studies indicated that presowing seed treatment with Atonik significantly increased radicle length and rootlet number/seedling without affecting plumule growth. Amongh various nine treatments tried, presowing seed treatment with Atonik followed by Kaoline spray one month after monsoon termination yielded significantly higher by 16% over untreated control during dry season of 1982-83 when monsoon receded early in October. This was observed to be due to increased water use efficiency by reduction in leaf area index. Kaoline increased radiation reflectance by 4.4% allowing canopy to absorb lower solar radiation. Stomatal conductance and transiration remained statistically unaffected. response of Kaoline was, however not apparent during 1983-84 when rainfall distribution was uniform extending until late October.

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Pathological and Epidemiological studies on foliar pathogens of cotton*

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ABSTRACT : Foliar diseases due to *Xanthomonas compestris* pv. *malvacearum, Myrothecium roridum Alternaria macrospora, Helminthosporium spiciferum* and *Curvularia lunate* are responsible for lower yield of seed cotton and poor quality of lint. Among different ages inocula and plant, youngest inoculum (7 days) when sprayed on oldest plant (55 days) produced maximum disease in case of all the pathogens except *M. roridum.* Spores and hyphal masses produced the maximum disease than their suspensions. Exotic cultivars (*G. hirsutum*) were more susceptible to all diseases than *desi* cultivars (*G. arboreum*).

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Incidence of spotted bollworm *Earias vittela* (Fab) in relation to some phytochemicals in cotton

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ABSTRACT : Eighteen genotypes of cotton were selected under field conditions of IARI Farm New Delhi on the basis of physical characters to screen against spotted bollworm, *Earias vittela* (Fab.). Response of genotypes of bollworm varied from tolerant to susceptible. Biochemicals like total sugar, reducing and non-reducing sugar, proteins, amino acids in cotton squares and green bolls did not exhibit any significant influence on bollworm incidence. Only moisture content of bolls was significantly and positively correlated with bollworm infestation. Among the secondary plant substances (tannin, silica, free gossypol), only silica had significant negative correlation with pest attact. However, tannin and gossypol were significantly higher in squares and bolls of tolerant genotypes in comparison to susceptible ones.

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Appropriate crop stage for initiating spray against bollworms on *Arboreum* co ton

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ABSTRACT : In the Punjab, present recommendations for initiating spray on *arboreum* cotton against bollworms are calendar based which may not hold good as fruiting period depends upon sowing time, variety and other factors. The studies conducted to determine the appropriate crop stage suggested that *arboreum* cotton needs plant protection when 25 per cent plants are in squaring stage. Spray initiation at this stage resulted in the lowest average bollworms infestation on loculi basis (4.1%) against 18.4 per cent in untreated check. The highest net monetary gain over untreated check (Rs. 5340/ha) was obtained by spray initiation when 25 per cent plants were in squaring stage.

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Genetic of quantitative traits in desi cotton

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ABSTRACT : Generation means of three crosses of Indegenious cotton (*G. arboreum* L.) were investigated for yield, boll number, boll weight and number of seeds per locule consecutively for two years. The estimated of gene effects showed that all the three types of gene effects were present in varying proportion for yield and boll number in crosses viz., HD 5 x LL desi and HD 11 x LL desi. Whereas, for boll weight and number of seeds per locule had only additive (d) and epistasis type of gene effects for most of the cases. Epistatic effects in different characters differed in different crosses and over years. To get a clear picture, the nature of gene effects in different crosses should be estimated in different environments preferably over year and locations for advancing a promising cross successfully in our breeding programme.

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Chemical control of fungal root rot complex of cotton caused by mixed inocula of *Rhizoctonia solani* and *Macrophomina phaseolina*

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ABSTRACT : The disease control efficacy of seven commonly recommended fungitoxicants viz., carbendazim, thiphanate-M, carboxin, quintozene, MEMC, captafol and thiram used individually and in combinations as seed treatment, pre-sowing soil drench and seed treatment plus soil drench were tested against fungal root rot complex of cotton under artificially infested soil with *Rhizoctonia solani* and *Macrophomina phaseolina*. It was observed that seed treatment with carbendazim followed by quintozene provided maximum disease control, whereas thiram and captafol proved to be least effective. The combined seed treatment of quintozene+carbendazim also provided good disease control. Pre-sowing soil drench with quintozene and carbendazin provided maximum disease control against the test pathogens. These two fungitoxicants also gave very efficient disease control when used both as seed treatment and soil drench. Maximum disease incidence due to mixed infection was noticed when only N was incorporated to soil, whereas the disease incidence was less in soils having P+K, N+K or K fertilizers. It was recorded that the performance of three fungitoxicants was variously altered by the fertilizers in amended soils. However, carbendazim seed treatment was most effective in different fertilizers amended soils. The potentiality of carbendazim was reduced by P and K fertilizers. The efficacy of fungitoxicants was variously altered in soils amended with different organic amendments. Disease control potentiality of carbendazim seed treatments was least affected. Saw dust was more active in reducing the efficacy of fungitoxicants. The decrease of fungitoxicity was relatively more when high doses of amendments were used.

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Heterosis and inbreeding depression for ginning characters in upland cotton

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ABSTRACT : The degree of mean heterosis was greatest for lint index (25.49), followed by seeds/boll (18.07) and seed index (15.58). The values of mean inbreeding depression were ranging from 2.70 to 3.92 per cent. The highest mean inbreeding depression was shown by the seeds/boll. Generally, the F_1 hybrids, which showed significant heterosis of ginning outturn also showed the higher heterosis for lint index and seed/boll. The hybrids showed significant heterotic effects for ginning outturn, lint index and seeds/boll, most of them having K 3499 as a parent.

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Effect of phosphorus application on the yield parameters and dry matter yield of different parts of the cotton plant (*Gossypium hirsutum* L.)

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ABSTRACT : Effect of phosphorus application on the yield parameters and dry matter yield of different parts of the cotton plant (*Gossypium hirsutum* L.) has been studied. It was observed that application of phosphorus significantly increased the dry matter yield of different plant parts, number of bolls/plant, boll weight and seed cotton yield per plant. Plant height increased significantly when 30 kg P_2O_5 ha^{-1} was applied. Application of 30 kg P_2O_5 ha^{-1} gave significantly response of 11.70 gm per plant over control.

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Effect of nitrogen levels, genotypes and time of picking on the quality of cotton seed

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ABSTRACT : Field experiment was conducted during the years 1981 and 1982 at the Research Farm of Haryana Agricultural University, Hisar with three genotypes of cotton fertilized with four levels of nitrogen (0, 40, 80 and 120 kg N/ha) and time of picking after boll opening (7, 14, 21, 28, 35 and 42 days). Genotypes nitrogen levels and time of picking had no effect on germination, damaged seed and oil contents. Protein percentage was increased with the increasing levels of nitrogen.