

ABSTRACTS

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A Model for Analysis of Associations of Morpho-Physiological Traits and Productivity in Cotton

S. M. GAZYANTZ AND R. G. DANI

*The Institute of Experiment Biology of Plant Scientific Production Establishment
"Biologist" Academy of Sciences, Uzbek S.S.R. 28 Faizulla Khojaev Street
Tashket-700 143 USSR*

ABSTRACT : In order to understand and define parameters of intensive cultivars, a certain scheme of investigation is demonstrated. Patterns of changes in some important physiological attributes and productivity were monitored in three sets of contemporary cultivars of *Gossypium hirsutum* L. and their F₁ hybrids, corresponding with alternative levels of irrigation applications and their interrelationships were analysed. A chain of genotypic correlations was found between such traits as the photochemical activity of the chloroplasts (PCA), carbon exchange rate (CER), number of chloroplasts in mesophyll cells, harvest index and early crop maturity. Negative correlation were detected between CER and leaf area per plant (LA). Both CER and LA were not correlated to seed cotton yield.

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Heterosis and Combining Ability Analysis in Upland Cotton

K. S. NIRANIA, P. P. JAIN, I. P. SINGH, O. P. TUTEJA AND G. S. SANDHU

*Cotton Research Station
HAU, Sirsa-125055 (Haryana)*

ABSTRACT : The present investigation was carried out with a view to obtain information regarding the extent of heterosis and combining ability in a line x tester analysis using three testers and fifteen lines. Statistical analysis for combining ability was found to be significant for all the five characters. Female testers, H-777 and HS-168 were best combiner for yield and its components and among the lines, Albar-637 and CB-2628 were the best parent. AC-726 was the best combiner for dwarfism. Heterotic effect were observed to be high in case of seed cotton yield, number of bolls and boll weight. For most of the crosses the heterotic effects noticed either in boll number or boll weight was also reflected in yield of seed cotton.

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Stability of Branching Pattern in Relation in Yield in Cotton (*G. arboreum* L.)

DALVIR SINGH, S. S. NEHRA AND D. P. SINGH

*Department of Plant Breeding
Haryana Agricultural University, Hisar-125004*

ABSTRACT : Stability parameters were computed for branching pattern and yield in a set of genotypes of *G. arboreum* L. using six environments i. e. three doses of nitrogen (40, 80 and 120 kg/ha) x two spacings (60 x 30 and 90 x 30) cms. Monopodial branches showed stable behaviour for strains, namely, HD-58, HD-44, HD-69 and HD-71. Strain HD-70 recorded highest mean seed cotton yield alongwith relatively good stability for production of fruiting branches, indicating the considerable importance of sympodia for higher yield in this genotype. It was found that yield, first fruiting node and sympodial branch were least

stable. For earliness (first fruiting node number) and sympodial branches both linear and non-linear components of variation were observed.

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Linex Tester Analysis for Yield and its Components in Cotton Upland

SHER SINGH VERMA, B. P. S. LATHER, URMIL VERMA

Department of Plant Breeding

Haryana Agricultural University, Hisar-125004

ABSTRACT : Line x tester analysis involving 16 lines and 4 testers was studied in upland cotton. It revealed the pre-ponderance of non-additive type of gene action for boll number per plant, boll weight and seed cotton yield. However, plant height, halo length and ginning outturn were controlled mainly by additive gene effects. General combining ability effects of the commercial parents indicated that none of the tester parents proved to be all round good general combiner for all the traits studied. Specific combining ability effects revealed that the crosses between high general combiners were not always the best for their SCA effects. Best specific crosses for all the six characters were selected and crosses like H-655C, XEC-97660, H-777 x IC-296, H-777 x EC-76766 and H-655, CEC-26618 were good specific cross combinations for seed cotton yield. The crosses viz. HS-50 x super okra, H-777 x Tester college station showed maximum SCA effects for boll number per plants HS 50 x Cocker-417 showed significant positive SCA effects for halo length. Exploration of these good combining parents and promising crosses in cotton breeding programmes has been suggested.

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Utilisation of Cotton Seed Products

A. D. TANEJA, A. P. SHARMA, L. K. BISHNOI AND M. S. KAIRON

Haryana Agricultural University

Hisar-125004

ABSTRACT : Cotton seed oil is used for edible purposes for soap making and for making lard compounds and margarine as well as for baking and for salad oil and salad dressing. Palmitic acid content in cotton seed oil is higher than in any other oil. Cotton seed hull contributes to about 37 to 60 per cent of the weight of cotton. Hull is mainly used as roughage in cattle feed in the mud used in the grilling of oil well, and for production of furfural and for preparing active carbon. Linter content varies from 3.2 to 14.5 per cent. Linters are used in the manufacture of absorbent cotton medical pads, gauge, twine wicks and carpet yarns, in mattresses, bedding productions and cushioning for furniture and motor cars. It is also used for preparing high grade cellulose and high grade bond papers. Cotton seed meal is used for preparing high quality edible cotton seed concentrate and in poultry and swine ration. It is used directly as a fertilizer. The protein content in cotton seed flour is found to vary from 50 to 70 per cent. The cotton seed flour is used as an additive in bakery products, as a filler in meat like products and as a protein supplement of diets. Cotton seed protein is added to bakery products. In order to reduce fat absorption. It is used in meat type products, such as hot dogs, lunch on meats, hamburger meats, sausage, meat leaf etc. Cotton seed protein have excellent nutritive value, blendness in flavour and have freedom from antinutritional factors. Future product development of cotton seed oil, linters, meal and hulls have also been discussed.

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Alterations in Phonoic Constituents in Cotton Leaves During Interaction with *Xanthomonas Campestris* pv. *Malvacearum*

H. K. L. CHAWLA, R. KUMARI AND M. S. CHAUHAN

*Department of Chemistry and Biochemistry
Haryana Agricultural University, Hisar-125 004*

ABSTRACT : Total phenols, flavonols and O-dihydroxy phenols were found to be higher in leaves of control (uninoculated) plants of resistant cv (Suman) as compared to those of the susceptible cv (H 937) in growth phase I (30d) without much differences (except flavonols) in growth phase II (60 d). Inoculation resulted in a general increase in these constituents in both the cultivars however, this increase except that of O-dihydroxy phenols was much higher in Suman. On the other hand, gossypol content of control leaves of resistant cv were found to be little lower to those of the susceptible cv however, inoculated leaves showed an increase in Suman without much change in H 937 at various time intervals in two growth phases.

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Response of Upland Cotton to Nitrogen Application in Relation to Preceding Crop. II. Nitrogen Availability and its Efficiency

A. S. DHINDWAL, K. L. CHHABRA AND B. P. S. LATHER

*Cotton Research Station,
Haryana Agricultural University, Sirsa*

ABSTRACT : A three year field investigation was done at Cotton Research Station, Haryana Agricultural University, Sirsa to study the effect of six preceding rabi crops and four N rates to cotton on the availability and efficiency of nitrogen N availability in top soil had recovered @ 3-5 kg/ha/year under legumes whilst a deficit of 3-6 kg/ha/year remained under cereals plots. Under legumes-cotton sequences, the optimum dose of N was 72-83 kg/ha but it was linear up to the highest rate of N (120 kg/ha) in cereal cotton sequences. Maximum efficiency of 9.4 kg seed-cotton per kg of applied N was recorded with 40 kg N/ha after lentil and the minimum 3.3 with 120 kg N/ha after fallow. In unfertilized cotton, the benefits from the preceding rabi crops of lentil, chickpea, fenugreek or fallow were 22 to 34 kg/ha of the chemical fertilizer applied, following cereals (wheat or oats). With 40 kg N/ha, the corresponding benefits were 75, 59, 46 and 33 kg N/ha, respectively.

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Ratooning Performance of Different Cotton Varieties as Influenced by Agronomic Regimes

D. G. GIRI AND M. V. DHOBLE

Marathwada Agricultural University, Parbhani-431 402

ABSTRACT : Field experiments were conducted from 1985-86 to 1986-87 at Parbhani on ratoon management of cotton. This study revealed that the variety pH-36 and NH-262 showed good ratooning ability as compared to other cotton varieties and produced significantly higher seed cotton yield. Normal sowing (onset of monsoon) of main **kharif** crop facilitated the early establishment of ratoon and resulted in significantly higher seed cotton yield than delayed sowing. The spacing of 60 x 15 cm recorded significantly higher seed cotton yield of ratoon crop over 60 x 30 cm. Similarly, higher fertility level of 100 : 50 : 50 kg NPK/ha produced significantly higher seed cotton yield of ratoon crop as compared to 50 : 25 : 25 kg NPK/ha.

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Effect of Mulching and Irrigation Levels on Yield and Water Use of American Cotton

B. L. VERMA, R. K. SIAG AND RAM DEO
Agriculture Research Station, Sriganaganagar

ABSTRACT : A field experiment was conducted on sandy loam soils of Agriculture Research Station, Sriganaganagar during *kharif* seasons of 1985-86, 1986-87 and 1987-88. Treatments consisted of combinations of three levels of irrigations (i. e. IW/CPE 0.8, 0.6 and 0.4) and four levels of mulching (control, Paddy straw @ 3 tons/ha and Polythene sheets). Maximum yield of cotton was obtained when it was given irrigation at IW/CPE 0.8 and 0.6 were 19.4 and 15.7 per cent higher than irrigation at IW/CPE 0.4. Mulching of straw @ 6 tons/ha increased seed cotton yield by 10.8 per cent over control. Consumptive use increased with frequency of irrigation whereas water use decreased. Mulching increased the water use efficiency of the crop.

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Association of Physiological Parameters with cotton productivity under dryland conditions

A. M. DHOP, E AND S. L. JAMDAR
*Department of Botany,
Punjabrao Krishi Vidyapeeth, Akola-444 104 (M. S.)*

ABSTRACT : A field experiment was conducted in deep vertisol during 1985 at Cotton Research Unit, Punjabrao Krishi Vidyapeeth, Akola. Sixteen genotypes including seven of *hirsutum* (SRT-1, MCU-5, DHY-286, LRA-5166, AKH-81, L-147 and AKH-0442) four of *arboreum* (AKH-4, AKA-5, AKA-590 and ASA-235) and five cotton hybrids (H-4, AHH-468, Ach-16 and NHH-44 and Varlaxmi) were planted. Larger variability was evident. The variation in transpiration rate (TR), total leaf area (TLA), and leaf area efficiency (LAE) at boll setting ranged from 0.56 (AKH-4) to 7.29 (LRA-5166); 5.21 (NHH-44) to 199.22 (PKV-0422) dm² and 37.1% more than arboreum cotton, AKA-5.

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Losses Assessment due to foliar diseases and boll rot complex

M. S. CHAUHAN, J. P. S. YADAV, R. CHAUHAN AND V. K. RATHEE
*Department of Plant Pathology,
Haryana Agricultural University, Hisar-125 004*

ABSTRACT : During 1982-83 and 1983-84, three treatments while during 1984-85 to 1986-87 five different treatments (Natural infection : artificial inoculated control, possible complete protection from disease; possible complete protection from bollworms and possible complete protection from diseases and bollworms indicated that possible complete protection from diseases and bollworms gave significantly lower disease incidence due to leaf spotting diseases, minimum boll rot (green and dry boll basis), locule infection and higher yield of seed cotton was recorded.

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Influence of Bacterial Blight infection on seed cotton yield of upland cotton

M. K. MESHARAM AND SHEO RAJ

*Central Institute of Cotton Research, Post Bag No. 125 G. P. O.
Nagpur -440 001*

ABSTRACT : Five varieties viz., B 1007, SRT 1, L 417, LRA 5166 and Laxmi and three hybrids viz., H4, Godavari and AHH 468 of upland cotton were subjected to artificial infection and natural incidence of bacterial blight incited by *Xanthomonas campestris* pv. *malvacearum* for estimation of yield losses as compared with the protected crop. The potential loss varied from 9.10 to 32.29 per cent with an average of 18.67 per cent depending upon the nature of the cultivars and incidence of bacterial blight. The loss of seed cotton yield in experimental plots ranged from 4.65 to 11.32 per cent with an average loss of 7.67 per cent in natural incidence and 7.37 to 18.24 per cent with an average loss of 12.11 per cent in artificial infection.

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Influence of Phytochemicals of some link host plants on development and survival of *Earias insulana* (Boisd.)

M. K. MESHARAM AND SHEO RAJ

*Department of Entomology,
Haryana Agricultural University, Hisar-125 004*

ABSTRACT : Survival and post embryonic development of spiny bollworm (Lepidoptera : Nactuidae) was studied on 7 link host plants viz., Okra *Abelmoschus esculentus* (L.) Moench : cotton, *Gossypium hirsutum* L.; country mallow, *abutilon indicum* (L) sweet; Kungyl mallow, *side cordifolia* L.; Portia tree, *Thespesia populnea* (L.) soland ex Corr.; Shoe-flower, *Hibiscus rosasinensis* L., and *Dombiyya tree Dombeya acutangula* Cav. in relation to their biochemicals. Rearing of larvae on squares (flower buds) and fruits showed variable growth rates *S. cordifolia* and *G. hirsutum* were least suitable host plants for *Earias insulana* during November-December. Among various biochemicals correlation with pest survival. Impact of potassium, sulphur and phosphorus was non-significant.

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Effectiveness of Different Spray Schedule Against Bollworms on *Arboreum Cotton*

A. D. KHURANA

*Entomologist
H. A. U. Cotton Research Station, Sirsa*

ABSTRACT : Spotted bollworms (*Earias* spp.) and pink bollworm (*Pectinophora gossypiella*) *Saunders* are most destructive insect-pests of arboreum cotton. Spray schedule having one or two sprays of synthetic pyrethroids interdispersed with conventional insecticides showed superiority in checking bollworms incidence and recorded higher yield than the conventional spray schedules. Keeping bollworm infestation, seed cotton yield per hectare as well as net gain over the control in view. Spray schedule with monocrotophos-fenvelerate-carbaryl/quinalphos-cypermethrin was most effective and economical.

Population Dynamics of Whitefly, *Bemisia tabaci* (Gennadius) on Cotton and its Relationship with Weather Parameters*

N. B. ROTE AND S. N. PURI

*Main Cotton Research Station,
Gujrat Agricultural University, Surat-395 007*

ABSTRACT : The experiment conducted 1987-88 and 1988-89 revealed the appearance of whitefly population from first week of August to the middle of December. During the second year it was delayed by one month due to heavy rains. Whitefly population was higher in second half of October to early November. Amongst the weather factors, maximum temperature and sunshine hours were positively associated with whitefly population, while relative humidity, rainfall and rainy days were negatively associated. Combined effect of weather factors influenced nymphal population significantly in unprotected cotton during 1987-88 and explained 63.71 per cent variation. Whereas during 1988-89, both adult and nymphal populations were influenced significantly. The combined effects of weather factors explained 62.11 and 76.11 per cent variation in nymphal population in unprotected and protected cottons, respectively.