

## ABSTRACTS

*Journal of Cotton Research and Development* 11(2) July, 1997

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*J. Cotton Res. Dev.* 11 (2) 127-133 (July, 1997)

### **Anther culture studies in upland cotton (*Gossypium hirsutum* L.)**

S. B. PATIL AND B. M. KHADI

*Tissue Culture Laboratory, Agricultural Research Station, Dharwad-580 007*

**ABSTRACT :** Anther culture studies in *G. hirsutum* cotton were made to optimise bud, media and to elucidate possible ontogeny of microspore sporophytic growth in cultured anthers, Anthers with uninucleate microspores, cultured on MS medium containing NAA (10.0 mg/l)+BA (1.0 mg/l) found optimal for callus induction in anthers of cultivar Abadhita. The MS medium with NAA (1.0 mg/l)+BA (1.0 mg/l) found to maintain callus for 5-6 weeks without subculture. Suspension cultures were developed to induce embryogenesis in microspore calli using liquid MS medium with various plant growth regulators combinations. The liquid MS medium IAA (0.5 mg/l) + TDZ (1.0 mg/l) could induce development of early stage embryos without further development or plant morphogenesis.

*J. Cotton Res. Dev.* 11 (2) 134-137 (July, 1997)

### **Seed setting efficiency in nine cultivars of cotton under north zone conditions**

R. A. MEENA AND O. P. TUTEJA

*Central Institute for Cotton Research Regional Station, Sirsa (Haryana)*

**ABSTRACT :** Seed setting efficiency of six released cultivars for north, central and south zones of upland (*G. hirsutum*) and three of desi (*G. arboreum*) cotton were studied at C. I. C. R. Regional Station, Sirsa during 1992-93 and 1993-94. The seed setting efficiency ranged from 74.0 to 81.5% in *G. hirsutum* and from 73.2 to 88.6% in *G. arboreum* varieties. In *G. hirsutum* the seed setting efficiency was highest in H-777 (81.5%) where as in *G. arboreum* it was highest in AKH-4 (88.6%). In general, diploid cotton (AKH-4, LD 327 and K-10) showed greater seed setting efficiency than tetraploid cotton (Suman, IRA-5166, H-777, Zhurar, LH-900 and Bikaneri Narma). In LRA-5166, LD-327 and K-10, the seed setting was considerably higher in early phase of flowering, whereas, in Suman, H-777, Zhurar, LH-900, Bikaneri Narma and AKH-4, the middle flowering period was found to be better for higher seed setting efficiency.

*J. Cotton Res. Dev.* 11 (2) 138-143 (July, 1997)

### **A study of genotype x environment interaction for yield and its component characters in American cotton**

HANUMAN, S. SINGH AND ANIL KHIPPAL

*Department of Plant Breeding, CCS Haryana Agricultural University, Hisar-125 004*

**ABSTRACT :** A field experiment was conducted to study genotype x environment interaction in ten American cotton hybrids grown in randomized blocks (with their parents and check variety HS 45) in four artificially created environments (two nitrogen fertilizer doses and two spacings). Genotype x environment interaction and its sub component heterogeneity between regression were significant for all the traits. Twelve genotypes were stable for boll weight, nine for monopods, seven for sympods, boll number and seed cotton yield and five for plant height. The check variety HS 45 was stable for yield and its important component characters. The varieties H 999, H 974 and H 777 were stable for yield and one of its important component characters. The genotype H 777 x GC 182 was found stable for yield.

*J. Cotton Res. Dev.* **11** (2) 144-147 (July, 1997)

## **Path analysis of yield components under completely unprotected conditions in rainfed American cottons**

J. S. V. SAMBA, MURTHY AND B. RAMA RAO

*R. A. R. S. Lam, Guntur-522 034*

**ABSTRACT** : In rainfed American cotton (*Gossypium hirsutum* L.) under completely unprotected condition, analysis of correlation, path coefficient, variability, heritability and genetic advance with 45F<sub>1</sub>'s and their ten parents for yield and yield components sucking pests and bollworm incidence revealed that boll number and plant height were found to be important yield components. Open boll damage and Jassid per leaf exerted significant negative association with seed cotton yield. So due weightage may be given for boll number and plant height while evolving varieties/hybrids with built in resistance.

*J. Cotton Res. Dev.* **11** (2) 148-153 (July, 1997)

## **Combining ability analysis for fibre characters over environments in upland cotton**

M. J. PAVASIA AND P. T. SHUKLA

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

**ABSTRACT** : In an 8 x 8 parent diallel cross of *G. hirsutum* L. evaluated in 3 environments, additive type of gene action was preponderant for ginning percentage, seed index, lint index, 2.5% span length and fibre fineness. Interaction effects of GCA and SCA with environments were highly significant for all the characters except ginning percentage and 2.5% span length respectively. The GCA effects were more stable over a range of environments, whereas the SCA effects were much influenced by environmental variation for the traits. Parent, LRK-516 found to be good general combiner for all the characters while G. Cot. 10 also found to be good general combiner for all the characters except fibre fineness. Cross combinations. G. Cot. 10 x B. N. and G 2360 x LRK-516 gave high SCA effects for seed index, lint index and 2.5% span length, while crosses H 777 x DCI-108 and Sharda x G. 2360 for ginning percentage, seed index and lint index.

*J. Cotton Res. Dev.* **11** (2) 154-161 (July, 1997)

## **Studies on the effect of staggered sowing of inter crops in summer *Gossypium hirsutum* L. Cotton Var. Kop-498 on yield and monetary returns**

V. S. MANE, M. D. YADAV AND S. S. MEHETRE

*All India Co-ordinated Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722*

**ABSTRACT** : An experiment entitled "Studies on the effects of staggered sowing of inter crops in Summer *Gossypium hirsutum* L. Cotton Var. Kop-498 on the yield and monetary returns" was conducted at the Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri (M. S.), during 1989-90, 1990-91 and 1991-92. The results revealed that sowing of intercrops, one month in advance in summer irrigated cotton found to give more seed cotton yield and monetary returns than sowing of inter crops alongwith cotton under summer irrigated conditions. Among intercrops advance sown groundnut and cowpea gave significantly highest monetary returns and L. E. R. than other intercrops tried.

*J. Cotton Res. Dev.* **11** (2) 162-168 (July, 1997)

## **Effect of package of agronomic practices on yield and quality of cotton *G. hirsutum* (Kop. 498) under summer conditions**

V. S. MANE, R. S. DARADE, M. D. YADAV AND S. S. MEHETRE

*All India Co-ordinated Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri-413 722*

**ABSTRACT :** An experiment on the effect of package of Agronomical practices on the yield of seed cotton and fibre qualities of *G. hirsutum* (Kop-498) under summer condition was conducted at Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth Rahuri (M. S.) during summer season of 1988, 1989 and 1990. The results revealed that yield of seed cotton obtained due to different treatments were significant. The treatment of full package of practices recorded significantly highest yield of seed cotton (1969 kg/ha) than rest of the treatments. Among package of practices weeding (82%) fertilizers (35.2%) and plant protection (34.94%) were the important factors affecting the yield of seed cotton under summer irrigated conditions and are required to be adopted timely. As regards quality of fibre it was revealed that there was no significant effect of any of the treatments on fibre qualities. However, there was a slight increase in fibre properties by adopting full package of practices.

*J. Cotton Res. Dev.* **11** (2) 169-180 (July, 1997)

## **Stage-specific response of American cotton (*Gossypium hirsutum* L. Var. H-777) to interactive effects of sodium chloride and potassium nitrate**

C. L. GOSWAMI

*Department of Botany, CCS Haryana Agricultural University, Hisar-125 004*

**ABSTRACT :** Interactive effects of Sodium Chloride and Potassium Nitrate on vegetative and reproductive parameters were evaluated in American cotton (*Gossypium hirsutum* L. var H-777) grown under screen house conditions. Treatments with sodium chloride and potassium nitrate were given either after seedling emergence or at squaring. Reproductive stage was more sensitive to these treatments. Increasing potassium nitrate in presence of salt further aggravated the deleterious effects of high salt, thereby tolerance to salt decreased. However, low salt with high level of potassium nitrate stimulated plant growth and cotton yield and thus salt tolerance increased. Various organs showed different degrees of response to salt and potassium nitrate.

*J. Cotton Res. Dev.* **11** (2) 181-190 (July, 1997)

## **Biological control of root rot of cotton (*Gossypium* spp.) caused by *Rhizoctonia* species using *Trichoderma viride* and *Trichoderma harzianum* under screen house conditions**

S. S. JAKHAR, M. S. CHAUHAN AND J. C. DUHAN

*Department of Plant Pathology, CCS Haryana Agricultural University, Hisar-125 004, India*

**ABSTRACT :** Both the antagonists viz., *Trichoderma viride* and *Trichoderma harzianum* were found effective in controlling root rot of cotton in varieties HS-6 (*Gossypium hirsutum* L.), HD-107 (*Gossypium arboreum* L.) and hybrid HHH-81 (Intra *hirsutum* hybrid) when applied as seed treatment, soil treatment, seed treatment followed by soil treatment and soil treatment followed by seed treatment. *T. viride* was found best in soil treatment, whereas *T. harzianum* was found best in soil treatment followed by seed treatment.

In this study, *T. harzianum* was found superior to *T. viride*, however, statistically at par in per cent mortality of seedlings in all the experiments.

*J. Cotton Res. Dev.* **11** (2) 191-195 (July, 1997)

## **Anatomy of *Gossypium arboreum* lines immune to grey mildew disease**

PUNIT MOHAN, P. M. MUKEWAR, SHEO RAJ AND V. V. SINGH

*Division of Crop Protection, Central Institute for Cotton Research, Post Bag No. 225, G. P. O., Nagpur-440 001*

**ABSTRACT** : Seven germplasm lines immune to grey mildew disease (*Ramularia areola*) namely, 'Bangladesh', 'G 135-49', '30805', '30814', '30826', '30838' and '30856' were subjected to anatomical investigations in a process to understand the status of host resistance. The cultivars 'AKH 4' and 'G 27' served as the susceptible controls. The micromorphological observations of foliage for related components relevant to pathogenic resistance viz., cuticle thickness, lamina thickness, thickness of palisade and spongy parenchyma, number of epidermal cells and the stomata per microscopic field were determined. The investigations revealed the cuticle and lamina thickness of very high order in immune lines. The thickness covered by palisade parenchyma per microscopic field was also higher in immune lines, on the other hand, no differences were noticed in relation to thickness covered by the spongy parenchyma. The number of epidermal cells were more and, conversely and as anticipated the number of stomata were less in immune lines in comparison to susceptible cultivars. The expression of various attributes in relation to mechanism of host resistance observed in present studies should form the criterion for understanding the immunity of *G. arboreum* cottons against the grey mildew disease.

*J. Cotton Res. Dev.* **11** (2) 196-205 (July, 1997)

## **Field resistance of cotton to *Myrothecium* leaf spot (*Myrothecium roridum* Tode ex Fr.) and *Alternaria* leaf spot (*Alternaria macrospora* Zimm.) diseases**

M. S. CHAUHAN, J. P. S. YADAV AND JAGDISH BENNIWAL

*Department of Plant Breeding, CCS Haryana Agricultural University, Hisar-125 004*

**ABSTRACT** : The unimportant fungal foliar diseases namely *Myrothecium* leaf spot and *Alternaria* leaf spot in late seventies and early eighties have become economically important and destructive after the introduction of synthetic pyrethroids for the control of bollworms. The diseases assume a serious form in seasons of prolonged rainfall and humidity and is hardly noticeable during relatively dry periods. Diploid cottons suffered serious injuries. Four hundred and three germplasm lines were screened under inoculated unprotected conditions during 1994-96 crop seasons. Against *Myrothecium* leaf spot disease, 33 entries belonging to *G. hirsutum* and intra *hirsutum* hybrids were recorded in the immune grade of the reactions. Majority of the entries were in moderately susceptible grade. Most varieties of the American cottons were found susceptible while the oriental species did not suffer severe damage even under favourable conditions. Only 30 entries belonging to both *G. hirsutum* and *G. arboreum* and their hybrids were noticed in immune grade against *Alternaria* leaf spot disease. Against both these diseases only 3 entries were noticed in immune grade while only 2 entries were in resistant grade of reactions.

*J. Cotton Res. Dev.* **11** (2) 206-208 (July, 1997)

## **Chemical control of bacterial blight including green boll rot phase of cotton**

M. R. PATIL, B. N. GHODERAU, H. G. DANDALE AND C. U. PATIL

*Cotton Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola-444 104*

**ABSTRACT :** Studies on chemical control of bacterial blight of cotton were undertaken during 1988-89, 1989-90 and 1990-91 at Cotton Research Unit of Dr. P. D. K. V. Akola. Non-significant differences were noticed during 1988-90 where as significant differences were noticed during 1989-90 and 1990-91 in controlling bacterial blight of cotton. Amongst the treatments streptomycin + copper oxychloride was significantly superior over rest of the chemical treatments which were at par to each other. Yield differences for seed cotton were found non-significant for every year. The boll rot stage of bacterial blight was not observed during the course of study.

*J. Cotton Res. Dev.* **11** (2) 209-219 (July, 1997)

## **Effect of leafhopper, *Amrasca biguttula biguttula* (Ishida) incidence on quantitative and qualitative loss in cotton at different stages of crop growth**

A. G. SREENIVASA AND B. V. PATIL

*Department of Entomology, College of Agriculture, Raichur-584 101*

**ABSTRACT :** Field experiments conducted in a factorial randomised block design to assess the effect of leafhopper, *Amrasca biguttula biguttula* (Ishida) (Homoptera : Cicadellidae) incidence on growth, yield and quality parameters of DCH-32 hybrid cotton have revealed that both quantitative and qualitative losses were maximum in later stage of crop growth. The biometric parameters viz., plant height, number of leaves, number of fruiting bodies, yield parameters viz., good and bad opened bolls and yield of seed cotton were affected to a considerable extent by the pest even after 50 days of crop period. Among quality parameters 2.5 per cent span length and bundle strength tenacity (g/tex) were influenced to a greater extent which remaining parameters of quality were not affected by the pest incidence.

*J. Cotton Res. Dev.* **11** (2) 220-225 (July, 1997)

## **Influence of red spider mite, *Tetranychus macfarlanei* Baker and Pritchard infestation on growth and yield of cotton**

S. N. PATIL, B. V. PATIL AND K. THULASI RAM

*Department of Agricultural Entomology, College of Agriculture , Raichur-584 101, Karnataka*

**ABSTRACT :** Quantity estimation of losses due to red spider mite, *Tetranychus macfarlanei* Baker & Pritchard release was studied in DCH-32 and NHH-44 hybrids of cotton at Regional Research Station, Raichur, Karnataka. At early stage of release, reduction in number of leaves per plant was more pronounced in DCH-32 as compared to NHH-44. Reduction in leaves per plant was directly related with mite population at 90, 120 and 150 days crop stage. There was no effect of mite infestation on plant height in both the hybrids. Number of fruiting bodies were low at 90 days crop growth compared to 120 and 150 days of mite release. Mite release at 90 days of crop growth recorded lower yield as compared to 120 days and 150 days.

*J. Cotton Res. Dev.* **11** (2) 226-231 (July, 1997)

### **Effect of red spider mite, *Tetranychus macfarlanei* Baker & Pritchard incidence on qualitative parameters of cotton fibre**

S. N. PATIL, B. V. PATIL AND K. TULASI RAM

*Department of Agricultural Entomology, College of Agriculture, Raichur-584 101, Karnataka*

**ABSTRACT :** Crop loss estimation in terms of quality due to red spider mite, *Tetranychus macfarlanei* Baker and Pritchard was studied on DCH-32 and NHH-44 hybrids at Regional Research Station, Raichur, Karnataka. Analysis of fibre quality parameters showed that 2.5 per cent span length, fineness micronaire value and maturity coefficient were not affected by differential mites infestations in both the hybrids. There was significant effect on per cent uniformity ratio and bundle strength tenacity. The released treatments on 90 days after crop growth recorded significantly more effect as compared to 120 and 150 days of release on both the hybrids.

*J. Cotton Res. Dev.* **11** (2) 232-238 (July, 1997)

### **Efficacy of diafenthiuron (Polo 50 SC) for control of whitefly *Bemisia tabaci* (Genn.) on upland cotton (*Gossypium hirsutum* L.)**

G. S. SIMWAT AND ASHOK K. DHAWAN

*Department of Entomology, Punjab Agricultural University, Ludhiana-141 004*

**ABSTRACT :** The efficacy of diafenthiuron (Polo 50 SC), an organophosphate insecticide was evaluated at 0.2, 0.3, 0.4 and 0.8 kg a.i./ha for control of whitefly at high population density on F 846 and LH 900 varieties of upland cotton during 1994-95. The efficacy of this new insecticide was compared with recommended systemic insecticides, dimethoate, oxydemeton methyl and phosphamidon all @ 0.188 kg a.i./ha and contact insecticides, monocrotophos at 0.5 kg acephate at 1.5 kg, triazophos at 0.6 kg and ethion at 1.0 kg a. i./ha. Efficacy of insecticide treatment was compared on the basis of counts of whitefly adults and percent reduction of pest population. Results have revealed that effectiveness of diafenthiuron at all its dosages was significantly better than systemic insecticides and monocrotophos. Further, the performance of diafenthiuron was at par with acephate, triazophos and ethion at 2, 4 and 6 days after spray. At 10 days after spray, however, this chemical was significantly better than triazophos and ethion. Excepting 0.2 kg a.i./ha, the efficacy of all other dosages of diafenthiuron at 2 days after spray were statistically at par with each other. Considering the effectiveness and persistence, diafenthiuron at 0.30 kg a.i./ha was most appropriate for the control of whitefly at high population density during end September to first half of October.