

## ABSTRACTS

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### **Yield component analysis in introgressed lines of upland cotton (*Gossypium hirsutum* L.)**

**J. S. V. SAMBA MURTHY AND N. CHAMUNDESWARI**

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**ABSTRACT :** One hundred and three introgressed lines of *Gossypium hirsutum* cotton along with two checks were evaluated to study genetic variability, character association and path analysis between seed cotton yield and its component characters. Significant genotypic differences existed among the genotypes for all the characters studied. High GCV, heritability and genetic gain were recorded in seed cotton yield/plant, followed by number of bolls/plant. Both at phenotypic and genotypic level, seed cotton yield was found positively and strongly correlated with number of bolls/plant. This was further confirmed by path coefficient analysis. So, due weightage may be given to number of bolls/plant in yield improvement programmes. Further, it is suggested that a balance should be struck between boll weight and number of bolls/plant since they are negatively and significantly correlated with each other.

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### **Cytomorphological studies in interspecific hybrid *Gossypium hirsutum* x *Gossypium aridum***

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**ABSTRACT :** Comparison of morphological characters of parents and hybrid indicated that leaf shape of  $F_1$  hybrid of *Gossypium hirsutum* x *Gossypium aridum* was found to be inherited from *G. hirsutum* where as the flower colour and large deep red petal spot resembled *G. aridum*. The bractioles resembled female parent. The cytological analysis in triploid hybrid *G. hirsutum* x *G. aridum* showed the chromosomes number to be  $2n = 3x = 39$ . The maximum association of  $13^I + 13^{II}$  was recorded and average chromosomes association of  $11.74^I + 10.46^{II} + 1.68^{III} + 0.31^{IV}$  was recovered per cell.

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### **Estimates of mean performance, heterosis and genetic diversity among private and public sector hybrids of *Gossypium hirsutum* L.**

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**ABSTRACT :** Twenty-five hybrids of *Gossypium hirsutum*, 15 of private sector and 10 of public sector, along with two standard checks were evaluated in a randomized complete block design during *kharif*, 2003 for yield related traits. The objective was to assess the mean performance for different traits; to estimate heterosis; and to study the genetic divergence among these hybrids. None of the public and private sector hybrids gave significantly higher seed cotton yield than check hybrid LHH 144. However, private sector hybrid, ARCH 7754 of Ankur Seed Company had high mean performance for most of the traits. Among public sector hybrids, HHH 395 and HHH 397 were found promising for seed cotton yield. The public sector hybrid TCCHH 127 had the lowest seed cotton yield and lint yield. High standard

heterosis for seed cotton yield, lint yield, boll weight and lint index was also expressed by ARCH 7754. All the hybrids were grouped into five clusters. Two private sector hybrids, ARCH 7754 and Ajeet 166, were most divergent and formed two separate clusters.

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## **Heterosis for seed cotton yield and its qualitative characters of *Gossypium hirsutum* L. in cotton**

**S. K. VERMA, O. P. TUTEJA, SUNIL KUMAR, RAM PARKASH, RAM NIWAS AND D. MONGA**

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**ABSTRACT :** A line x steter crossing programme was taken up with ten female lines and five male parents with a view to obtain information regarding selection of parents for heterosis breeding in a well adapted genotypes of diverse geographic origin. Heterosis for yield and fibre properties was estimated in 50 cross-combinations. Maximum heterosis for seed cotton yield was observed in the cross-combination CIT (7-2) x H 777 (72.55%), followed by CISV 48 x H 1098 (69.82%), for plant height in CISV 12 x RS 810 (9.11%), for number of monopods in CISV 12 x RS 810 (47.94%), for number of sympods in CIT (7-2) x RS 2013 (18.43%), for number of bolls/plant in cross CIT (7-2) x RS 2013 (82.35%); for boll weight in the cross CISV-24 x RS 810 (22.22%), for GOT in the cross CISV 31 x H777 (5.30%) and for 2.5% span length in CISV 12 x H1098 (3.18%). Looking on to *per se* performance of hybrids, seed cotton yield varied from 415 to 1724 kg/ha and the crosses CISV-29 x RS 810 and CISV 48 x H 1098 represented lowest and highest mean value, respectively. Similarly, the range mean value for number of bolls/plant varied from 15.6 (CISV 56 x RS 810) to 42.3 (7-2) x RS 2013). Maximum variability was exhibited by seed cotton yield (18.94%), followed by number of monopod (18.90%) and plant height (13.22%). The *per se* performance of 12 crosses was significantly higher than the check variety RS 810.

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## **Correlation and path coefficient analysis in rainfed hybrid cotton (*Gossypium hirsutum* L.) as influenced by boron application**

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**ABSTRACT :** The correlation studies in *Gossypium hirsutum* cotton hybrid under rainfed condition as influenced by boron application revealed that relative water content in leaves had highly significant positive correlation with photosynthetic area/plant, plant height and sympodial branches/plant. The seed cotton yield/ha had highly significant positive association with leaf area index, plant height, photosynthetic area/plant, sympodial branches/plant, boll weight, seed cotton yield/plant, biological yield/ha, lint index, relative water content and positive association with harvest index. Path analysis indicated that the relative water content in leaves had highly positive direct and indirect effect *via* biological yield/ha, photosynthetic area/plant, lint index, sympodial branches/plant, plant height, harvest index, boll weight, leaf area index, seed cotton yield/plant, leaves/plant and bolls/plant on the seed cotton yield/ha. Photosynthetic area/plant had negative direct and indirect effect through biological yield/ha, plant height, relative water content in leaves, leaf area index, sympodial branches/plant, boll weight, lint index, seed cotton yield/plant, harvest index, leaves/plant and bolls/plant on the seed cotton yield/ha. Lint index had the highest positive direct effect on the seed cotton yield followed by sympodial branches/plant, leaf area index, relative water content in leaves, boll weight, biological yield/ha, seed cotton yield/plant and number of bolls/plant.

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## **Combining ability analysis for yield and other economic traits in white x colour linted crosses of *Gossypium hirsutum* cotton**

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**ABSTRACT :** In 8 x 8 diallel analysis of upland cotton (*Gossypium hirsutum* L.), two colour linted and six linted genotypes were assessed for combining ability and nature of gene action for ten economic characters. Parents and crosses showed significant differences for all the characters. The estimates of general combining ability variances revealed that the characters *viz.*, 50 per cent flowering, number of bolls/plant, ginning outturn, lint index, and oil content were governed by additive type of gene action. While non additive type of gene action was found in the case of plant height, number of sympodia/plant, boll weight and seed cotton yield/plant. The parents, Algerian brown, Sahana, MCU 7, SVPR 2 and MCU 11, were good general combiners. The parents, Algerian brown, Sahana, MCU 7, SVPR 2 and MCU 11, were good general combiners. The crosses MCU 12 x MCU 7, SVPR 2 x Sahana, Algerian brown x MCU 11, Arkansas brown x MCU 7, Arkansas green x MCU 5, Arkansas green x Algerian brown, MCU 7 x Sahana and SVPR 2 x MCU 5 were indentified as a good specific combiners for seed cotton yield and yield attributing characters.

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## **Evaluation of *Gossypium hirsutum* genotypes for important economic characters by different methods**

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**ABSTRACT :** A set of 43 genotypes was evaluated for 14 different traits using three different methods *viz.*, mean, scores and selection indices. Seven genotypes *viz.*, Surabhi, MCU 12, TSH 9704, CCH 510 -4, CPD 745, GMR 5 and ARB 760 showed superior performance than other genotypes in an overall estimation. So these genotypes could be used in the hybridization programme in order to get more favourable gene combinations for all the desirable attributes in improvement of upland cotton.

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## **Heterosis for seed cotton yield and its contributing traits in upland cotton (*Gossypium hirsutum* L.)**

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**ABSTRACT :** The present study was undertaken to estimate standard heterosis of newly developed cotton hybrids with the objective of exploring possibilities of their commercial utilization. For this purpose, 48 upland cotton hybrids were developed crossing 16 females with three testers in a line x tester design during *kharif*, 2003. These hybrids along with one standard check (HHH 223) were evaluated during *kharif*, 2004. The experimental material was grown at Cotton Research Station Sirsa, during *kharif*, 2004 in a randomized block design with three replications. Considerable amount of heterosis was recorded for seed cotton yield and other related characters under study. Twenty two crosses exhibited more than 20 per cent heterosis for seed cotton yield/plant. Highest economic heterosis for seed cotton yield was observed in the hybrid HS 6 x G cot 12 to the tune of 50.9 per cent. Four other crosses which exhibited heterosis of more than 45 per cent were HS 6 x Gumbo delta type (50.76%), HS 88 x Stoneville 7A (49.37%), HS 88 x Delfos (45.9%) and HS 88 x RS-875 (45.3%). All the crosses which showed high heterosis for yield invariably showed high positive heterosis either for number of bolls and/or boll weight. The hybrids HS 6 x G cot 12 and HS 6 x Gumbo delta type exhibited heterosis of more than 50 per cent and hence warranted their further testing over locations for commercial utilization. However, considering

the economic importance of various characters LAS 5 Red AK. RS 875. SK 663 and Gumbo delta type among the males and HS 6 among the females were identified as best parents and may be used for future breeding programmes.

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## **Heterosis for seed cotton yield and fibre quality characters in cotton (*Gossypium hirsutum* L.)**

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**ABSTRACT :** Investigation was carried out with a view to obtain information regarding selection of parents for heterosis breeding in a half diallel (excluding reciprocals) using 14 well adapted genotypes of diverse geographic origin. Heterosis for yield and fibre properties was estimated in 41 hybrids. Maximum heterosis for seed cotton yield was observed in the hybrid F 505 x PIL 8 (29.70%), however, for lint yield it was recorded in LRA 5166 x HS 6 (37.85%). For ginning outturn the highest heterosis of 9.01 per cent was observed in five cross combinations *viz.* LRK 516 x 505, LH 1556 x HS 6, LH 1556 x Jhorar, H1098 x HS 6 and LRA 5166 x HS 6. The cross combination LRK 516 x CNH 911 showed maximum heterosis of 14.72 per cent for 2.5 per cent span length. Maximum negative heterotic effect for fibre fineness was found in Pam 1x CNH 911 (-9.30%) and for bundle strength maximum heterosis in desired direction was observed in cross LH 1556 x RST 9 (7.11%).

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## **Correlation and path analysis in cotton (*Gossypium hirsutum* L.)**

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**ABSTRACT :** Fourteen genotypes of upland cotton were evaluated to study the character associations and path effects. Correlation studies revealed that seed cotton yield had positive and significant genotypic and phenotypic correlations with number of bolls / plant, number of sympodia / plant, boll weight, plant height and number of monopodia / plant. Path analysis at genotypic level revealed that number of bolls / plant exhibited the highest direct effect on seed cotton yield / plant, followed by plant height, ginning percentage and number of sympodia / plant. Selection made through these traits could bring an improvement in seed cotton yield.

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## **Comparative performance of *Bt* cotton hybrid, MECH 162, against non *Bt* cotton cultivars under different agro ecological situation of Marathwada region**

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**ABSTRACT :** Performance of *Bt* cotton hybrid, MECH 162, was studied in comparison with non *Bt* (*Gossypium arboreum* and *intra hirsutum* hybrid) cultivars under six agro ecological situations of rainfed ecosystem of Marathwada region during 2002-03 and 2003-04. In general, MECH 162 was found superior in yield under most of the agro ecological situations. However, losses in yield in case of non-*Bt* cotton varieties varied under different situations. Under S<sub>1</sub> (deep soil + high rainfall) and S<sub>3</sub> (medium soil + high rainfall) situations, losses were relatively less ranging from 9.9 to 29.1 per cent whereas losses were on higher side ranging from 24.8 to 54.6 under S<sub>4</sub> (medium soil + low rainfall), S<sub>5</sub> (shallow soil + high rainfall)

and S<sub>6</sub> (shallow soil + low rainfall) situations. In general, losses were less in *G. arboreum* varieties under most of the agrological situations as compared to *intra-hirustum* hybrid.

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## **Intercropping in cotton in India - a review**

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**ABSTRACT :** In a situation where two third of the cultivated area is rainfed, feeding and clothing the teeming millions is a challenging job to the agricultural scientist. Intercropping is the best mechanism for exploiting the environment, minimizing risk and ensuring subsistence farming. Intercropping is getting greater emphasis because of yield stability and returns per unit area even under adverse condition. Intercropping was originally practiced as an insurance against crop failure under rainfed conditions. At present, the main objective of intercropping is to get higher productivity per unit area. This system uses resources efficiently and productivity is increased. Cotton has slow initial growth and when grown at wide row, spacing can be utilized for intercropping. The wider space in between the rows can effectively be utilized for growing compact short duration and quick growing crops like green gram, black gram or soybean. Intercropping system enables crop diversification within an agro eco-region and ensures balanced returns to the farmers besides other benefits. Intercropping of short duration crops does not affect the yield of cotton and leads to extra yield of companion crop and thus maximizes monetary returns.

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## **Effect of farm yard manure, chemical fertilizers and micronutrients on yield, economics and fibre properties of cotton**

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**ABSTRACT :** Field experiments were conducted at Regional Agricultural Research Station, Lam during rainy season (July-August to February-March) of 2003-2004 and 2004-2005 on rainfed cotton to study the integrated effect of inorganic fertilizers, organic manures and micronutrients. The results revealed that application of 25 per cent nitrogen through farm yard manure in addition to the recommended dose of nitrogen + phosphorus and potassium adjusted to 100 per cent recommended dose (T<sub>6</sub>) recorded higher values for yield and yield attributes *viz.*, plant height, number of sympodia and bolls plant<sup>-1</sup> and economics of cotton over control. Boll weight (g), seed index (g), lint index (g) and ginning out turn were higher in T<sub>6</sub> (50% N through farm year manure and 50% N through chemical fertilizer + PK adjusted to 100% recommended dose). Seed cotton yield, gross returns, net returns and benefit cost ratio were more during 2003-2004 than during 2004-2005. Significant differences existed among the treatments for fibre quality parameters *viz.*, 2.5 per cent span length and bundle strength during 2004-2005. Positive nutrient balance was observed for both soil nitrogen and phosphorus, while soil potassium exhibited a negative nutrient balance during both the seasons.

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## **Effect of tillage and residue management practices on growth and yield of cotton wheat cropping system of north western Rajasthan**

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**ABSTRACT :** A field experiment was conducted on sandy loam soil, alkaline in reaction (pH 8.1), low in organic carbon and available nitrogen, medium in available phosphorus and high in available potassium during *kharif* and *rabi* seasons of 2000-2001, 2001-2002 and 2002-2003 at Agricultural Research Station, Sri Ganganagar to find out the effect of tillage and residue management practices on growth, yield attributes and yield of cotton (*Gossypium hirsutum* L) and wheat (*Triticum aestivum* L) cropping system in canal command area of north west Rajasthan. Among tillage practices, deep ploughing before cotton sowing once in two years + reduced preparatory tillage with rotavator + herbicide application (pendimethalin @ 1.5 kg ai/ha) for early season weed control significantly increased pooled seed cotton yield (15.22 q/ha), boll weight, number of bolls/plant and plant height as compared to reduced preparatory tillage with rotavator for cotton and wheat (11.34q/ha). However, residue management practice i.e. R<sub>5</sub> (cotton stalks and wheat straw shredded and incorporated in soil produced significantly higher pooled seed cotton yield (14.40 q/ha) over R<sub>1</sub> (cotton stalk and wheat straw removed i.e. completely clean) (12.55 q/ha). One disc + double cultivator for cotton and wheat produced significantly higher pooled wheat grain yield (43.59 q/ha), tillers/m<sup>2</sup> and number of grains/spike than reduced preparatory tillage with rotavator for cotton and wheat (39.36 q/ha). R<sub>5</sub> produced significantly higher pooled wheat grain yield (42.99q/ha) over R<sub>1</sub> (39.45 q/ha).

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## **Effect of plant densities and NPK levels on yield of newly released *deshi* varieties of cotton (*Gossypium arboreum* L.)**

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**ABSTRACT :** A field experiment was carried out at Parbhani during *kharif*, 2002 to 2004 with an objective to find out suitable plant density and NPK level for newly developed *deshi* cotton varieties viz. PA 255 (Parbhani Turab) and PA 402 (Vinayak) under rainfed conditions. In pooled results highest plant density of 98765 plants/ha (45 x 22.5 cm spacing) was found suitable for both the *deshi* cotton varieties. Whereas, application of NPK @ 50:25:25 kg/ha to PA 255 and 60:30:30 kg/ha to PA 402 was found highly beneficial. However, the differences in the yield of *deshi* cotton varieties (PA 255 and PA 402) were not significant during individual years as well as in pooled analysis.

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## **Impact of soil depths on yield of *Bt* cotton hybrids under rainfed conditions**

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**ABSTRACT :** Field studies were made with *Bt* cotton (*Gossypium hirsutum*) hybrids alongwith their non *Bt* counterparts and a local hybrid as check in different soil depths shallow (<30 cm) and medium deep (75-90 cm) at Central Institute for Cotton Research, Nagpur, during *kharif*, 2001-02. *Bt* hybrids MECH 184, MECH 162 and MECH 12 performed well in medium deep soil compared to shallow soil and non *Bt* hybrids with respect to harvest index, boll weight and yield of seed cotton. Biomass accumulation at 110 days after sowing in *Bt* hybrids (mean dry matter, 34.6 q/ha) was significantly lower than non *Bt* and NHH44 (mean dry matter, 44.7q/ha). Significant differences were observed between different genotypes for boll weight and number of bolls/plant. Medium deep soil had positive influence on yield and yield attributing parameters as compared to shallow soil. Among the hybrids, MECH 12 *Bt* attained the highest boll weight (5.6 and 4.9 g), followed by MECH 184 *Bt* (4.7 and 4.4 g) as compared to NHH44 (3.8 and 3.3 g) in medium deep and shallow soil, respectively, under rainfed conditions. All the three *Bt* hybrids had high potential in production giving higher harvest index as compared to non *Bt* hybrids.

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## **Integrated nutrient management in *Gossypium hirsutum* cotton cv. Phule 492 under summer irrigated conditions**

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**ABSTRACT :** An experiment was conducted on medium deep black soil at Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri to evaluate the integrated effect of organic and inorganic fertilizer management on the production of *Gossypium hirsutum* cotton cv. Phule 492 during summer season of 2002-2003 and 2003-2004. The soil was low in available nitrogen, low in available phosphorus and high in available potash. The experiments were laid out in randomized block design with 10 treatments replicated four times. Treatment T<sub>9</sub> (FYM 10 t/ha + 100% RDF) recorded the highest seed cotton yield (2100 q/ha) and remained statistically *on a par* with T<sub>10</sub> (50% RDF + sunhemp *in situ* @ 15 kg/ha) during the second year (2003-2004) and on pooled data basis. Treatments T<sub>10</sub> (50% RDF + sunhemp *in situ* @ 15 kg/ha) remained statistically *on a par* with T<sub>6</sub> (FYM 5 t/ha + 100% RDF) and T<sub>8</sub> (FYM 10t/ha + 50% RDF + Foliar spray of nutrients 2% urea at (flowering) + 2% DAP at boll development stage. Treatment T<sub>9</sub>, T<sub>10</sub> produced highest number of bolls/plant, height bol weight and plant height than other treatment combination.

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## **Response of newly released cotton (*Gossypium hirsutum*) varieties to plant densities and fertilizer levels**

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**ABSTRACT :** A field experiment was conducted on clayey soils at Cotton Research Scheme, Marathwada Agricultural University, Parbhani during rainy season of 2003-04 with the objective to find out the suitable plant density and fertilizer level for newly released cotton genotypes *viz.* NH 545 and PH 348. The results revealed that the highest plant density of 55555 plants/ha and fertilizer level of 50:25:25 NPK kg/ha proved suitable and beneficial for these varieties in enhancing seed cotton yield.

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## **Response of promising *Gossypium hirsutum* hybrids to fertilizer levels in irrigated north western plain zone of Rajasthan**

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**ABSTRACT :** A field experiment was conducted with three cotton hybrids and a local check under three doses of fertilizers (75, 100 and 125% R.D.F.) at Agricultural Research Station, Sriganganagar during *khariif*, 2003. The soil of the experiment field was sandy loam in texture, alkaline in reaction (pH 8.1), low in available nitrogen, medium in available phosphorus and high in available potash. The crop was sown in the first fortnight of May. The results indicated that *hirsutum* hybrid NAVKAR produced significantly higher seed cotton yield (2516 kg/ha) over hybrid ARCHH (1987 kg/ha) and RAJ HH 16 (2138 kg/ha). As regards to ancillary characters more boll weight (3.32) and number of bolls/plant (40.56) were also recorded with NAVKAR than rest of the hybrids. Application of 100 per cent R.D.F. significantly increased seed cotton yield (2282 kg/ha) over 75 per cent R.D.F. (1987 kg/ha) but remained statistically *on a par* with 125 per cent R.D.F. (2372 kg/ha). It gave 17.58 per cent higher seed cotton yield over RS 2013.

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## **Screening of cotton genotypes for drought tolerance based on stress susceptibility index**

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**ABSTRACT :** Fifteen cotton genotypes developed at Nagpur and Sirsa were evaluated for their drought tolerance behaviour alongwith LRA 5166, Laxmi and H777 under irrigated and simulated drought conditions in the field. Higher yield of seed cotton was obtained in TOM 16 x BN, CNH 36 and HAF 277 x BN, followed by H777, LRA 5166, DCI 274, CNH 38 and CNH 34 SSI for biomass and yield was relatively low in genotypes DCI 274, CNH 30, CNH 40, DTS 2, LRA 5166, TOM 16 x BN and HAF 277 x BN. Based on the SSI for yield and biomass and RWC, genotypes DCI 274, CNH 36, CNH 40, DTS 2, LRA 5166 and TOM 16 x BN were observed to be drought tolerant.

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## **Effect of spacing and nitrogen on growth and yield of cotton hybrids under rainfed conditions of costal Andhra Pradesh**

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**ABSTRACT :** A field experiment was carried out at the Research Farm, RARS, Lam, Guntur to study the effect of spacing and nitrogen levels on performance of cotton hybrids under rainfed conditions of costal Andhra Pradesh during *kharif*, 2003. Among the hybrids tested PRCHH 5, RAHH 99 and NSPHH 7 recorded comparable seed cotton yield with the check hybrid Bunny and significantly superior over other hybrids PSCH 504 and Ankur 5642. Neither the spacings (120x60 cm, 120 x 90 cm and 90x60 cm) nor the rates of nitrogen application (120 and 150 kg N/ha) caused any variation in the growth and yield of cotton hybrids.

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## **Prospects of utilization of cotton stalks and its byproducts**

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**ABSTRACT :** The cotton plant stalk normally an agricultural waste is available to the extent of 15 million tonnes annually in India. It is desirable that every possible efforts should be made to find out the appropriate uses of this vast amount of agricultural waste. This will solve the disposal problem. Besides its limited use as fuel wood, the cotton stalks can be utilized for the preparation of boards, filter pulp paper, etc. Non availability of adequate raw material for paper pulp and board production is a global phenomenon. Corrugated boxes made from cotton stalk could be used for packing of fruits and vegetables. Attempts have also been made to grow *Pleurohis* species, an edible mushroom on cotton stalks.

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## **Performance of Bt cotton hybrids at different plant populations in south western region of Punjab**

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**ABSTRACT :** Among the various factors affecting the productivity of *Gossypium hirsutum* cotton hybrids, plant population play a significant role in enhancing the productivity of this crop. It is a continuous process for the replacement of existing varieties with hybrids. In most of the cases plant population is an important factor, which influences the seed cotton yield. Newly developed *Bt* and non *Bt* hybrids were compared at various plant populations to work out the optimum population for obtaining the higher yields. Both *Bt* hybrids i.e. RCH 134 and RCH 317 produced significantly higher seed cotton yield in comparison to their non *Bt* hybrids. The highest seed cotton yield was recorded at 67.5 x 90 cm spacing in RCH 134 which was significantly higher as compared to 67.5 x 75 and 67.5 x 105 cms.

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## **Performance of cotton hybrids under different spacings and nitrogen levels in black cotton soils of costal Andhra Pradesh**

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**ABSTRACT :** A field experiment was carried out at the Research Farm, RARS, Lam, Guntur to study the effect of spacing and nitrogen levels on performance of cotton hybrids under rainfed conditions of costal Andhra Pradesh during *khariif*, 2004. Though, the hybrids MECH 12 *Bt* and MECH 184 *Bt* produced less number of bolls/plant, the seed cotton yield was compensated by the bigger size of the bolls. The seed cotton yield did not markedly vary due to the hybrids and spacing. The seed cotton yield, net returns and benefit cost ratios obtained with the 120 kg N/ha was significantly higher than the seed cotton yield observed with the 90 kg N/ha. Neither the spacing adopted nor the nitrogen levels caused any variation in the quality of the fibre.

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## **Validation of IPM technology for rainfed cotton in western Orissa**

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**ABSTRACT :** A bio intensive IPM module against the insect pest complex of cotton (var. MCU 5) was validated over 50 ha under farmer's field conditions at village Gandhinagar in Nawarangpur district of Orissa during *khariif*, 2001-02. The major components of the IPM module were seed treatment with imidacloprid @ 7 g/kg of seeds, monitroing of bollworms through pheromone traps, two releases of *Trichogramma chilonis* @ 1.5 lakh/ha at 55 DAG (days after germination) and 65 DAG, foliar sprays of *Neem* seed kernel extract (NSKE) 5 per cent at 75 DAG and 105 DAG, foliar spray of HaNPV @ 500LE/ha at 90DAG, growing of maize and arhar as inter crop, installation of bird perches @ 20/ha, topping at 90 DAG, collection and destruction of harmful larvae at weekly interval, foliar spray of chlorpyrihos (0.05%) at 115DAG and monocrotophos (non IPM). The IPM module registered significantly lower sucking pest population and bollworm damage with increasing activity of natural enemies and gave higher monetary return over the farmers' practices.

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## **Comparative safety of neem based insecticides**

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**ABSTRACT :** A field study on mortality of predatory neuropteran green lacewings (*Chrysoperla carnea* Stephens) due to use of insecticides was conducted during *kharif*, 1998-99 and 1999-2000. the minimum inhibition of eggs hatching was observed in the neem based insecticides. the larval mortality was maximum (88.46%) in pyrethroid treated plots whereas it was lowest in neem based bio pesticides. The maximum (67.74%) mortality in adult population was also found in pyrethroid treated plots whereas it was low in the plots treated with neem based biopesticides.

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## **Correlation of cotton (var. PA 183) to bacterial blight intensity with meteorological parameters**

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**ABSTRACT :** Cotton variety of PA 183 (*Gossypium arboreum*) was grown during the year 2002-03 and 2003-04 at Marathwada Agricultural University Campus, Parbhani and farmer's field at Asola, District Parbhani (Maharashtra). Observations of bacterial blight were recorded from the occurrence of the disease till harvest of the crop. Observations of the meteorological parameters 4 and 7 days prior to bacterial blight intensity and their cumulative sum at these stages were correlated with bacterial blight disease intensity. During the year 2002-03 bright sunshine (hrs) were positively and significantly correlated with disease intensity in both sprayed and unsprayed crop plots at 4 days before observation of disease whereas in both the plots per cent relative humidity (p.m.) and rainfall were positively and significantly correlated with bacterial blight intensity at 7 days before observation of disease. During the year 2003-04 rainfall (mm) had significant and positive correlation with bacterial blight intensity in protected and unprotected plots at 4 and 7 days before cumulative sum meteorological parameters.

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## **Relationship between meteorological parameters and bacterial blight of cotton (Hybrid NHH 44)**

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**ABSTRACT :** Cotton crop in two experimental plots at Marathwada Agricultural University Campus, Parbhani and one experimental plot at village Asola was grown to record intensity of bacterial blight disease. Observations on meteorological parameters recorded at Department of Meteorology, MAU, Parbhani were used to workout linear regression relationship with bacterial blight intensity. A prediction system based on observation of individual meteorological parameters 4 and 7 days prior to bacterial blight intensity and cumulative sum of meteorological parameters at these stages was developed for the years 2002-03 and 2003-04. Such a prediction system having high prediction error was suitable for forecasting bacterial blight intensity when information about a single meteorological parameters was available.

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*J. Cotton Res. Dev.* **20** (1) 121-124 (January, 2006)

## **Evaluation of some systemic and non systemic fungicides against *Myrothecium roridum* Tode ex Fr. causing leaf blight of cotton (*Gossypium hirsutum*)**

**D. S. TOMAR AND P. P. SHASTRY**

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**ABSTRACT :** The efficacy of Carbendazim, Carboxin, Chlorothalonil, Propineb and Triademefon was tested for their effect on the radial and spore germination of *Myrothecium roridum*. All the five fungicides tested were effective in reducing both the radial growth and germination of conidia. Carbendazim was

found to be the best fungicide in reducing the radial growth, sporulation and germination of conidia. These chemicals were also evaluated in the field to ascertain their efficacy to control *Myrothecium* leaf blight. All the fungicides were significantly effective in controlling the intensity of *Myrothecium* leaf blight over control. The least per cent disease index (PDI) was recorded in Carbendazim, followed by Carboxin, Triadimefon, Chlorothalonil and Propineb, respectively. The highest yield was recorded in Carbendazim (894.51 kg/ha), which was significantly superior over all other treatments recording a 25.42 per cent increase in seed cotton yield over control.

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*J. Cotton Res. Dev.* **20** (1) 125-126 (January, 2006)

## **Chemical control of Alternaria blight of cotton**

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**ABSTRACT :** Seven fungicides were tested during 2001-02 and 2002-03 at Agricultural Research Station, Dharwad Farm against *Alternaria* blight of cotton incited by *Alternaria macrospora* Zimm. Copper oxychloride (0.3%) was effective in controlling the disease and gave maximum yield. It was followed by Mancozeb (0.2%) and were *on a par* with each other in controlling the disease.

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*J. Cotton Res. Dev.* **20** (1) 127-130 (January, 2006)

## **Influence of various factors on infection of cotton plants by *Myrothecium roridum* Tode ex Fr.**

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**ABSTRACT :** *Myrothecium* leaf blight of cotton has emerged as the most important disease in East Nimar of Madhya Pradesh. An experiment was conducted at Regional Agriculture Research Station, J. N. K. V. V., Khandwa to identify appropriate conditions for infection of cotton plants by *Myrothecium roridum*. All the stages of plants growth were susceptible with a relatively higher susceptibility up to 60 days. The conidial washing treatment at 3000 and 6000 rpm, before inoculation, increased infection. Proportionate increase in infection was observed with the increased duration of leaf wetness. Foliage injury by pinpricks was found to predispose the tissue to infection by the fungus.

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*J. Cotton Res. Dev.* **20** (1) 131-133 (January, 2006)

## **Growth and survival of *Helicoverpa armigera* (Hubner) and *Spodoptera litura* (Boisd.) on transgenic Bt cotton**

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**ABSTRACT :** Growth and survival of *Helicoverpa armigera* (Hubner) and *Spodoptera litura* (Boisd.) was studied on the commercial transgenic cotton cultivar MECH 162 Bt and its conventional counterpart non Bt MECH 162, in the laboratory using food material from field grown plants. Larval mortalities of 58.7 and 43.5 per cent and 7.69 and 5.88 per cent in respect of Bt and non Bt cotton were observed for *H. armigera* and *S. litura*, respectively. Slow growth rate induced by the action of Bt insecticidal protein led to more number of days to mortality in *H. armigera* over N Bt cotton. Larval development period between Bt and N Bt cultivars was insignificant for *S. litura*. Survival index for *H. armigera* and *S. litura* on Bt and non Bt cotton was 20 and 47.7 per cent and 84.6 and 82.3 per cent, respectively. Lower larval mortality and higher survival index for *S. litura* raises concern that it could become a pest of increasing importance with widespread cultivation of Bt cotton over larger areas in future.

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## **Field evaluation of cotton genotypes against *Amrasca biguttula biguttula* Ishida**

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**ABSTRACT :** Field evaluation of 78 genotypes was carried out for their resistance/susceptibility to sucking pests with special reference to *Amrasca biguttula biguttula* under unprotected conditions at Regional Agricultural Research Station, Nandyal. Jassid injury grades were recorded using 1-4 scale and injury index was worked out. NHH 44 and NDH 1588 were found resistant while 49, 14 and 9 were in moderately resistant, susceptible and highly susceptible grades respectively.

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*J. Cotton Res. Dev.* **20** (1) 135-137 (January, 2006)

## **Spatial distribution of cotton aphid, *Aphis gossypii* Glover and its predator, *Chelomenes sexmaculatus* (F.)**

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**ABSTRACT :** Spatial distribution of cotton aphid, *Aphis gossypii* Glover and its predator *Chelomenes sexmaculatus* (F.), was studied on cotton variety MCU 5 at Umerkote, during *kharif*, 2002-03. Various dispersion parameters revealed that *A. gossypii* followed contagious pattern (negative binomial) of distribution while its predator, *C. sexmaculatus*, regular (positive binomial) distribution.

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## **Decreasing susceptibility of *Helicoverpa armigera* (Hubner) to conventional insecticides on cotton**

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**ABSTRACT :** Efficacy of two conventional insecticides, endosulfan and quinalphos, was evaluated against *Helicoverpa armigera* (Lepidoptera : Noctuidae) infesting upland cotton variety H 1098, alongwith some newer insecticides at the farmer's field near Hisar during 2003. The results showed that as compared to 100 per cent mortality of the larvae given by indoxacarb (150 g a. i./ha), endosulfan (780 g. a. i./ha) and quinalphos (560 g a. i./ha) provided 70.37 and 70.83 per cent mortality, respectively, indicating decreased susceptibility of the pest to the conventional insecticides. It was suggested that incorporation of newer insecticides in the integrated pest management strategy could help in achieving effective control of this pest on cotton.

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*J. Cotton Res. Dev.* **20** (1) 140-142 (January, 2006)

## **Search for sources of resistance in upland cotton cultivars/varieties against bacterial blight, Myrothecium blight and New wilt**

**P. P. SHASTRY AND D. S. TOMAR**  
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**ABSTRACT :** Eighty five genotypes were screened against bacterial blight, Myrothecium blight and New wilt during *khari*, 2002-2003 under field conditions. The grading was done on 0-4 scale. None of the genotypes was found immune against bacterial blight. Twelve entries were found resistant, 33 moderately resistant and 24 moderately susceptible against bacterial blight. Eleven entries were found resistant to Myrothecium blight.

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*J. Cotton Res. Dev.* **20** (1) 143-144 (January, 2006)

### ***In vitro* evaluation of fungicides against *Fusarium solani* of cotton**

**S. N. CHATTANAVAR, SRIKANT KULKARNI AND B. M. KHADI**

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**ABSTRACT :** Eight fungicides *viz.*, Carbendazim, Carborin, Thiram, Methoxy ethyl mercury chloride, Captan, Copper oxychloride, Benomyl and Mancozeb *in vitro* at six concentrations (50, 100, 200, 500, 750 and 1000 ppm) were tested against *Fusarium solani* by poisoned food technique. Per cent inhibition was worked out for all the treatments. Carbendazim, Carboxin and Benomyl completely inhibited the growth of *F. solani*. The next best fungicides were methoxy ethyl mercury chloride and captan which completely inhibited the growth of test fungus at 500 ppm.

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### **Field evaluation of fungicides against *Ramularia areola* Atk. of cotton**

**S. N. CHATTANAVAR, A. S. SHARMILA AND B. M. KHADI**

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**Abstract:** Seven fungicides namely, Tridamorph, copper oxychloride, mancozeb, propineb, ziram, wettable sulphur, carbendazim were sprayed thrice at an interval of 15 days for the control of *Ramularia areola*. All fungicides tested significantly reduced the disease over control and increased the yield. Carbendazim showed maximum disease control followed by ziram and tridemorph. However, maximum yield was obtained by ziram followed by carbendazim.

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### **Evaluation of herbicides against *Rhizoctonia solani* causing root rot of cotton**

**S. N. CHATTANAVAR, A. S. SHARMILA AND B. M. KHADI**

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**ABSTRACT :** An experiment was conducted under (Alachlor, Roundup, Diuron, Stomp and Paraquat) *in vitro* Cmidcharis to know the effect of five weedicides on the growth of *Rhizoctonia solani*. Alachlor and dicuron herbicides ranked as number one and two herbicides to inhibit the growth of *R. solani*. Next was paraquat.