

ABSTRACTS

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Genetic analysis for yield and earliness complex in upland cotton (*Gossypium hirsutum* L.)

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ABSTRACT : A half diallel set of 10 parental lines of upland cotton was evaluated for node number of first sympod, node number of first monopod, length of first sympod, length of sympod at 50 per cent plant height, number of monopods and number of sympods per plant, plant height, seed cotton yield, number of bolls per plant and boll weight. All these characters contributed for earliness and yield. Significant additive genetic variance was detected for number of monopods per plant, length of first sympod and length of sympod at 50 per cent plant height. Dominance variance was found to be significant for node number of first monopod and node number of first sympod, while for rest of the traits, it was highly significant. Epistasis was found to be present only in the inheritance of boll weight.

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Identification of suitable *Bt* cotton hybrids under rainfed condition of Marathwada region

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ABSTRACT : Yield potential of approved *Bt* cotton hybrids under rainfed condition was assessed at Cotton Research Station, Nanded during *kharif* seasons of 2007-2008 and 2008-2009 with an objective to identify suitable *Bt* cotton hybrids for Marathwada region. Pooled data revealed that *Bt* cotton hybrids *viz.*, MRC 7301 BG II (2095 kg/ha) and Ajeet 11 BG II (1928 kg/ha) recorded highest seed cotton yield with significant superiority over checks, Ankur 651 BG I and NHH 44 (Non-*Bt*). These hybrids also depicted superior fibre quality. Considering agro-climatic conditions of Marathwada region, *Bt* cotton hybrids *viz.*, MRC 7301 BG II, Ajeet 11 BG II, NCS 145 BG I (Bunny BG I), NCS 954 BG I, NCS 207 BG II, MRC 6301 BG I, RCH 144 BG I, RCH 386 BG I, SP 504 BG I and NCS 929 BG I will prove helpful to farmers to get the better yield.

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Comparison of cotton DNA extraction methods for the high yield and quality from various cotton tissues

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ABSTRACT : Cotton is known to contain high concentrations of polyphenolic substances that become oxidized and covalently bind to proteins and nucleic acids during the homogenization step of DNA extraction, thus rendering the DNA unsuitable for most research applications. To work at DNA level a fast, simple and especially reliable DNA extraction method is a pre-requisite. The aim of the present work was to develop the protocol for DNA extraction from various tissues of different varieties. Various protocols have been tested and modified. The results show that among tested combination of extraction buffer, Triton-X-100 Extraction Buffer was optimal for DNA isolation from cotton tissue.

Estimation of gene effects for yield and fibre quality characters in inter-varietal crosses of upland cotton (*Gossypium hirsutum* L.)

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ABSTRACT : The objective of the study was to estimate gene effects in three inter-varietal crosses of upland cotton by generation mean analysis. In cross-1, epistasis was present for seed cotton yield, bolls per plant and 2.5 per cent span length, while additive-dominance model was adequate for boll weight and ginning outturn. In cross 2, three-parameter model was adequate to explain variation for seed cotton yield and bolls per plant, whereas presence of epistasis was indicated for boll weight, ginning outturn and 2.5 per cent span length. In cross-3, epistasis was detected for seed cotton yield, bolls per plant, boll weight and 2.5 per cent span length. The results revealed that the type of gene effects involved in the inheritance of different traits differed in three crosses and demonstrated the importance of additive as well as non-additive gene effects. As scaling tests and joint scaling test revealed the presence of epistasis for most of the characters studied, it was concluded that the estimation of only additive-dominance gene effect presuming absence of epistasis would be misleading. In view of the parallel role of additive and non-additive gene effects in the inheritance of different characters, it was suggested that sophisticated selection procedures as recurrent selection and population improvement programmes should be followed.

Stability analysis of seed cotton yield and its components of released *Bt* cotton hybrids of Gujarat state

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ABSTRACT : Fifty-eight released *Bt* cotton hybrids were tested for their performance at four agro climatic conditions and stability analysis was carried out to study the genotype x environments interaction for seed cotton yield and its component traits. The variance due to genotypes, environments, genotypes x environments and environments (linear) were significant for all the characters. The present investigation revealed that the *Bt* hybrids *viz.*, PRCH-31, Akka, RCH-2, MRC-6301, HM-322 and PCH-205 had regression coefficient around unity and least deviation from regression and thus appeared to exhibit good stability with more responsiveness to wide range of environments for seed cotton yield, lint yield, ginning outturn (%), boll weight and number of bolls per plant. Hence, these hybrids were highly adaptable and suitable for cultivation over a wide range of agro climatic conditions for the characters under study. None of hybrids showed stable performance for all the characters studied.

Studies on identification of GMS based cotton hybrids and their parental lines using SDS-PAGE of seed proteins

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ABSTRACT : Thirteen genotypes of *Gossypium hirsutum* were examined using SDS-PAGE to assess the seed protein profile in identification of inter- and intra-specific variation and distinguishing the hybrids from their parental lines. The electrophoretic profile of seed protein was unique and distinct for each genotype more by their quantitative than qualitative difference. A total of eight bands of different staining intensities were observed with relative mobility (Rm) values ranging from 0.30 to 0.90. Two bands were found to be more common in AKH-07-R, PKV-HY-5, CAK-053-A, AKH-545-R, CAHH-185 and CAK-071-A genotype under study. A minimum of three and a maximum of four bands were observed. The quantitative and qualitative variation in the banding pattern helped in distinguishing all the genotypes from one another.

Diallel analysis for combining ability for seed cotton yield and its components in *desi* cotton (*Gossypium arboreum* L.)

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ABSTRACT : A diallel analysis involving six diverse parents was carried out in *desi* cotton for seed cotton yield and its component characters. Both additive as well as non-additive type of gene action were involved in the control of these traits. A study of gca effects revealed that PA 255 and PAIG 29 were the best general combiners for seed cotton yield.

Role of improved agronomy in integrated pest management in cotton (*Gossypium* spp.)—An overview

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ABSTRACT : Cotton is grown commercially in south-east Asia including India under Asiatic, American or Egyptian cotton groups and is primarily used for its natural fibre. The current scenario in cotton revolves around increased cost of cultivation, enhanced use of pesticides, change in pest status as a result of transgenic cotton introduction, pest resurgence following frequent use of chemicals even for sap sucking pests, application of new molecules and deterioration of quality of ecosystem. Since the major emphasis in its cultivation has been the cost-cutting and low energy intensive farming with very low biotic pressure to harvest the better produce, improved agronomy has been in the forefront both from the stand point of integrated pest management (IPM) and higher yield/quality. Thus, many of the agronomic practices that assist in diminishing the pests load, increasing output and having better acceptability; are certainly adopted by the farmers. Therefore, a comprehensive and a concerted effort in utilization of available components of improved agronomy including rational use of insecticides and a quality bio-control based IPM concept alongwith farmers' participatory approach would go a long way in providing a sustainable IPM in cotton. Since this information is scattered and meagre on South-east Asian context including India, the conjunctive use of improved agronomy and IPM are elaborated here for arriving at an effective but practicable IPM strategy for realization of potential and profitable yields in cotton.

Integrated nutrient management (INM) in *hirsutum* cotton under cotton-wheat cropping system

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ABSTRACT : The field experiments were conducted on sandy loam soil of Sri Ganganagar to evaluate the integrated effect of organic manure and inorganic fertilizer on the production of *hirsutum* cotton under cotton-wheat cropping system during 2003-2004, 2004-2005 and 2005-2006. The pooled data of three years revealed that the treatment F₅ (100% RDF+25 kg ZnSO₄/ha)+boron (two foliar sprays @ 0.1%) recorded highest seed cotton yield and it was at par with F₃ (100% RDF+25 kg ZnSO₄/ha) and F₆ (50% N through organic+50% N through fertilizer+PK adjusted to 100% RD) and significantly superior to rest of the treatments. In view of wheat crop, the treatment F₆ (50% N through organic+50% N through fertilizer+PK adjusted to 100% RD) gave significantly higher grain yield (with pooled yield 42.9 q/ha) and straw yield over F₁ (Absolute control) and remained statistically at par with rest of the treatments. It might be due to residual effect of integration of organic and inorganic fertilizers applied during previous year

with F₃ (100% RDF+25 kg ZnSO₄/ha) and F₆ (50% N through organic+50% N through fertilizer+PK adjusted to 100% RD) cotton crop, which increased the ancillary characters and ultimately yield.

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Effect of quality of irrigation water and plant densities on productivity and economics of upland cotton (*Gossypium hirsutum* L.)

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ABSTRACT : A field experiment was conducted during *kharif* seasons of 2003-2004 and 2004-2005 at CCSHAU, Hisar to investigate the effect of irrigation water quality and plant densities on seed cotton yield, yield attributing characters and economic returns of cotton (*Gossypium hirsutum* L.). Plant height, boll weight, seed index and ginning outturn did not differ significantly due to quality of irrigation water and various plant densities. However, bolls/plant and seed cotton yield were significantly higher in canal water treatments when compared with saline water (EC_{iw}=8 dS/m). Among population densities, maximum number of bolls/plant was recorded at 90 x 40 cm row spacing, but highest seed cotton yield, maximum net returns (Rs. 13806) and benefit : cost ratio (1.55) were realized from a plant density of 55555 plants/ha with 60 x 30 cm spacing. But lowest seed cotton yield, minimum net returns (Rs. 6194) and B : C ratio (1.26) were recorded with a spacing of 90 x 40 cm spacing. The interaction between water quality and plant densities was found to be non-significant.

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Performance of *Bt* cotton hybrids at different nitrogen levels

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ABSTRACT : Response of two *Bt* cotton hybrids (Bunny *Bt* and Mallika *Bt*) and a non-*Bt* hybrid to five nitrogen levels (0, 60, 120, 180 and 240 kg/ha) was evaluated at the Agricultural College Farm, Bapatla during the *kharif* season of 2006-2007. The results revealed that plant height and dry matter accumulation by the Bunny *Bt* hybrid was found to be significantly lower than non-*Bt* Bunny. While Mallika *Bt* hybrid found to be the tallest and accumulated more dry matter than the other two hybrids. No significant differences were observed among cotton hybrids for number of monopodial branches and sympodial branches per plant. Number of bolls per plant in Bunny *Bt* was significantly higher than Bunny non-*Bt* and Mallika *Bt* and recorded heaviest bolls as compared to Bunny non-*Bt*. Seed cotton yield obtained with Bunny *Bt* was significantly superior to its non-*Bt* counterpart. The maximum plant height and the highest dry matter accumulation were recorded with the application of 240 kg N/ha. However, in case of Bunny *Bt* and non-*Bt* Bunny hybrids, the differences between 180 and 240 kg N/ha were not significant with respect to number of monopodial and sympodial branches per plant. Application of 240 kg N/ha recorded significantly higher yield and yield attributes compared to other levels of nitrogen.

Influence of date of sowing on the performance of American cotton (*Gossypium hirsutum* L.) genotypes under semi-arid region of Punjab

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ABSTRACT : A field experiment was conducted at Punjab Agricultural University, Regional Station, Bathinda to study the performance of American cotton (*Gossypium hirsutum* L.) genotypes under three dates of sowing during *kharif* 2006 and 2007. The treatments comprised three sowing dates (30 April, 15 May and 30 May) in main plots and five genotypes (RCH 134, RCH 317, MRC6301, MRC 6304 and F 1861) in sub-plots with four replications. There was non significant difference in seed cotton yield of all the genotypes by delay in sowing from April 30 to May 15 during both the years of study. However, there was significant reduction in seed cotton yield when sowing was delayed to May 30 in all the genotypes during both the years. Similarly, the number of bolls on May 30 sowing was significantly reduced as compared to April 30 and May 15 sowing. There was non-significant difference recorded in number of monopods, sympods and plant height in all the three dates of sowing. The highest seed cotton yield (27.4% more) was recorded in *Bt* cotton hybrid RCH 134 *Bt* and lowest in variety F 1861 during both the years of study indicated the superiority of *Bt* cotton hybrids over varieties.

Effect of doses and split application of nutrients through fertigation in *Bt* cotton (*Gossypium hirsutum* L.)

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ABSTRACT : A field experiment was conducted for three years during *kharif* season (2005-2006 to 2007-2008) to study the effect of nitrogen and potassium at 75, 100 and 125 per cent recommended doses and in 4, 6 and 9 split applications through fertigation under drip irrigation on *Bt* cotton (BG-1) at Nandyal, Andhra Pradesh in vertisols. Data indicate that fertigation with 125 per cent recommended dose of N and K applied 10 per cent basal and remaining 90 per cent from 30-120 days in nine splits recorded higher *kapas* yield of 2.69 t/ha compared to control with recommended manual fertilizer application which gave the *kapas* yield of 2.12 t/ha. Higher span length of 29.1 mm and strength of 22.9 g/tex cotton fibre was recorded with 100 per cent of N and K applied 10 per cent as basal and remaining 90 per cent in six and nine splits from 30-120 DAS, respectively. More uniformity ratio of 46.2 per cent was recorded with 125 per cent of N and K applied 10 per cent as basal and remaining 90 per cent in six splits from 30-120 DAS. Oil content was higher in fertigation treatments compared to manual application of fertilizers. It was concluded that under drip irrigation benefits were with more number of split applications of RDF than the present method of fertilizer application.

Effect of sulphur and irrigation on productivity of American cotton (*Gossypium hirsutum*)

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ABSTRACT : An experiment was conducted during rainy seasons of 2003, 2004 and 2005 at Agricultural Research Station, Sriganganagar, Rajasthan to study the effect of sulphur and irrigation levels on seed cotton yield, sustainability index, water use and water use efficiency of American cotton (*Gossypium hirsutum* L.) cv. RS 2013. Application of 20 kg sulphur/ha through gypsum or 30 kg of S/ha through single super phosphate (SSP) significantly increased the seed cotton yield over control. Highest sustainability index (62.9%), monopodials/plant (4.2), sympodials/plant (18.5), number of bolls/plant (25.6), cotton seed yield (10.84 q/ha), lint yield (5.20 q/ha) and water use efficiency (2.55 kg/ha mm)

were recorded with 20 kg sulphur/ha through gypsum. However, there was no significant difference among sulphur treatments. Increase in irrigation levels from IW/CPE ratio 0.5 to 0.9 increased yield and sustainability index, yield attributes like monopodials and sympodials. The highest seed cotton yield (16.93 q/ha), sustainability index (64.3%), monopodials/plant (3.9), sympodials/plant (18.8), seed yield (11.54 q/ha) and lint yield (5.39 q/ha) were recorded at IW/CPE ratio 0.9. However, highest ginning percentage (33.04%) and water use efficiency were recorded at IW/CPE ratio 0.5.

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Fertilizer management in cotton+soybean (1 : 2) intercropping system under rainfed conditions

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ABSTRACT : Field trials were conducted for three consecutive years from 2002-2004 to find out the fertilizer requirement of a variety and hybrid of cotton in intercropping system with soybean under rainfed conditions at Agricultural Research Station, Adilabad. Cotton hybrid, Bunny and variety, Narsimha intercropped with soybean at different fertilizer doses recorded 28 and 29 per cent more seed cotton yield, respectively, over corresponding sole crops. Recommended fertilizers (N : P : K) to both hybrid cotton and cotton variety Narsimha intercropped with soybean (JS 335) recorded significantly higher seed cotton equivalent yields, maximum net returns, BC ratio and LER.

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Effect of foliar application of nutrients on seed cotton yield and economics in *hirsutum* cotton

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ABSTRACT : A field experiment was conducted during two consecutive years of 2007 and 2008 at Oil Seed Farm of C. S. Azad University of Agriculture and Technology, Kanpur to study the effect of foliar application of nutrients on seed cotton yield and economics. Data revealed that significantly highest plant height (118.1 cm) was recorded with the application of 2 per cent urea and 2 per cent DAP over control. Significantly higher yield attributes, yield and GOT percentage of cotton were recorded with foliar application of 1 per cent $MgSO_4$ +0.5 per cent $ZnSO_4$ as compared to control. Maximum net return was recorded with the application of 1 per cent $MgSO_4$ +0.5 per cent $ZnSO_4$ followed by 2 per cent urea and 2 per cent DAP as compared to control. Highest B : C ratio was observed with the foliar application of 2 per cent urea and 2 per cent DAP followed by 1 per cent $MgSO_4$ +0.5 per cent $ZnSO_4$ as compared to rest of the treatments.

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Effect of different spacings and nitrogen levels on growth and yield attributes of American cotton (*Gossypium hirsutum* L.) Bt hybrids under irrigated conditions

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ABSTRACT : A field experiment was conducted at Punjab Agricultural University, Regional Station, Bathinda during *kharif* 2006-2007 to evaluate the optimum plant spacings and nitrogen levels for obtaining higher yield potential of newly developed Bt cotton hybrids *viz.*, Ankur 651 Bt and Ankur 2534 Bt. A closer spacing of 90 x 67.5 cm gave significantly higher seed cotton yield (24.59 q/ha) than other two tested spacings i. e. 105 x 90 cm (20.52 q/ha) and 90 x 90 cm (21.87 q/ha). The highest seed cotton yield was recorded with a nitrogen level of 150 kg/ha which was at par with 175 kg N/ha but significantly higher than 200 kg N/ha.

Fertilizer response studies in *Bt* cotton hybrid

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ABSTRACT : A field experiment was carried out to study the fertilizer response studies in *Bt* cotton hybrid (Brahma) during *kharif* 2006. The treatment combination comprised three nitrogen levels, namely, 150, 200 and 250 kg/ha and two levels each of P₂O₅ and K₂O, 30 and 60 kg/ha in split plot design with three replications. In *Bt* cotton hybrid (Brahma), nitrogen response observed upto 150 kg/ha only (2928 kg/ha) with further increase in N level cotton yields was reduced. Application of 60 kg P₂O₅ and K₂O/ha significantly recorded higher seed cotton yield over 30 kg/ha.

Exploitation of *Bt* cotton as an ovipositional trap crop in conventional cotton insect-pest management

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ABSTRACT : *Bt* cotton as an ovipositional trap crop with different proportions in conventional cotton insect-pest management was evaluated at Main Agricultural Research Station, Raichur under field conditions. The studies revealed that larval population of *H. armigera* on cotton when *Bt* cotton was used as trap crop indicated minimum incidence in cotton IPM treatment (0.19 larvae/plant) at 60 days after sowing (DAS) which was at par with *Bt* as border crop (0.23 larvae/plant) and this trend continued at 75, 90 and 105 DAS. However, the trend slightly deviated at 120 and 135 DAS though minimum larval load was registered (0.26 and 0.24 larvae/plant) in cotton IPM treatments, respectively. The minimum damage to green bolls (13.94 and 14.59%) was registered in cotton IPM treatment at 90 and 120 DAS, respectively. The cotton IPM treatment recorded very low incidence of pink bollworm (1.37 and 1.31 larvae/10 bolls) with 22.71 per cent locule damage. Cotton IPM package and *Bt* border experiments recorded maximum good opened bolls (41.93 and 42.11/plant) with least bad opened bolls (9.17 and 30.22/plant). These two treatments also excelled and registered highest seed cotton yield of 20.60 and 20.60 q/ha, respectively.

Studies on bollworm infestation on *Bt* and non-*Bt* cotton sown at varied spacings

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ABSTRACT : Field experiment was conducted at College of Agriculture, Badnapur with three *Bt* hybrids of cotton *viz.*, MECH 184, MECH 162 and MECH 12 and one non-*Bt* hybrid *i. e.* NHH 44 alongwith three different spacings *viz.*, 90 x 90 cm, 90 x 60 cm and 60 x 60 cm. The per cent bollworm infestation in shed material and on plant *i. e.* squares of *Bt* hybrids MECH 184 (2.34 and 2.49), MECH 162 (2.36 and 2.40), MECH 12 (2.32 and 2.46) and non-*Bt* hybrid NHH 44 (9.13 and 11.05), respectively. Buds *Bt* hybrids MECH 184 (2.00 and 2.33), MECH 162 (1.95 and 2.48), MECH 12 (1.99 and 2.57) and non-*Bt* hybrids NHH 44 (9.26 and 10.93), flowers *Bt* hybrids MECH 184 (2.14 and 2.36), MECH 162 (2.24 and 2.39), MECH 12 (2.25 and 2.47) and non-*Bt* hybrid NHH 44 (9.46 and 11.25), bolls *Bt* hybrid MECH 184 (1.94 and 2.61), MECH 162 (1.91 and 2.52), MECH 12 (1.98 and 2.57) and non-*Bt* hybrid NHH 44 (9.81 and 12.61). Fruiting bodies *Bt* hybrids MECH 184 (1.83 and 2.64), MECH 162 (1.87 and 2.58), MECH 12 (1.89 and 2.56) and non-*Bt* hybrid NHH 44 (10.39 and 12.67). The squares, buds, flowers, bolls and fruiting bodies were significantly low in *Bt* hybrids as compared to non-*Bt* cotton hybrid. The same trend was observed in pink bollworm infestation. The spacing response to bollworm infestation was more in

closer spacing (60 x 60 cm) as compared to wider spacing (90 x 60 cm and 90 x 90 cm). However, yield in closer spacing was significantly higher as compared to wider spacing.

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Studies on genetic variability, heritability and genetic advance in parental and hybrid populations of green lace wing, a predator of cotton pests

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ABSTRACT : The present investigation was carried out to study the genetic variability, heritability and genetic advance in the six parental and hybrid populations of *Chrysoperla carnea* Stephens (Neuroptera : Chrysopidae) originally collected from six different geographical regions of India at Biological Control Laboratory of Gujarat Agricultural University, Anand Campus during 1993-1995. Mean squares due to parents, hybrids and parents vs. hybrids revealed significant differences for most of the traits under study. Based on the mean performance for various biological traits, Anand population (A) proved to be the best followed by Aurangabad (AU), Jalgaon (J) and Hisar (H) populations. Among crosses, A x S and A x AU proved to be the potential crosses which involved Anand population (A) as one of the parents.

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Laboratory and field evaluation of novaluron (Rimon 10 EC) against *Spodoptera litura* (Fab.) on cotton

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ABSTRACT : Bioefficacy of novaluron (Rimon 10 EC) against *Spodoptera litura* (Fab.) (Noctuidae : Lepidoptera) attacking cotton was compared with other insecticides, namely, chlorpyrifos, thiodicarb, spinosad and endosulfan, in the laboratory during 2005 and at farmers' fields during 2006. For laboratory evaluation, initially the cotton plants at the research farm were sprayed with the requisite concentration of an insecticide; and afterwards batches of field collected larvae were also sprayed with the same concentration of the respective insecticide separately. Such larvae were provided with the leaves sprayed with the respective insecticide in the glass jars to record mortality. For field studies, different insecticides were evaluated at two locations keeping a plot size of 50 m² with three replications in a randomized block design. The results indicated that in the laboratory though initial mortality in novaluron at 0.005 and 0.01 per cent concentration was low, yet the larvae stopped feeding within two days and gradually all larvae were dead when observed after nine days of treatment. Spinosad (Tracer 45 SC) 0.015 per cent had no toxicity against this pest. Under field conditions, novaluron at 37.5 and 50 g a. i. was as good as thiodicarb (Larvin 75 WP) 470 g a. i./ha after seven days of spray. Chlorpyrifos (Tricel 20 EC) 400 g a. i. and endosulfan (Endocel 35 EC) 650 g a. i./ha proved significantly inferior to the above insecticides, both in terms of population reduction and increase in seed cotton yield. Taking into account the bioefficacy as well as seed cotton yield, novaluron 50 g a. i./ha was considered a better option against *S. litura*.

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Estimation of losses due to major insect-pests in *desi* cotton (*Gossypium arboreum* L.) in Maharashtra

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ABSTRACT : Studies on estimation of losses due to major pests in *desi* cotton (*Gossypium arboreum* L.) were conducted at Marathwada Agricultural University, Parbhani, Maharashtra during 2006-2007 by using *desi* cotton variety PA-255. The avoidable losses due to major insect-pests (sucking pests+bollworms) observed were 2.94 q/ha or 28.13 per cent.

Relative performance of *Bt* and their corresponding non-*Bt* cotton genotypes for sucking pests and yield

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ABSTRACT : Performance of eight *Bt* and their corresponding non-*Bt* cotton hybrids for sucking pests and yield was studied at Research Farm of CCS Haryana Agricultural University, Hisar. *Bt*-genotypes MRC-6301 (0.91 nymphs/leaf), ANKUR-2226 (0.92 nymphs/leaf) and MRC-6304 (0.93 nymphs/leaf) and non-*Bt* genotypes ANKUR-2534 (0.88 nymphs/leaf), MRC-6304 (0.91 nymphs/leaf) and RCH-317 (0.88 nymphs/ leaf) harboured less leaf hopper population as compared to others under unprotected conditions. While under protected conditions *Bt* genotypes RCH-138 (0.65 nymphs/leaf), RCH-317 (0.75 nymphs/leaf) and non-*Bt* genotypes MRC-6304 (0.76 nymphs/leaf) and ANKUR-2534 (0.77 nymphs/leaf) had less population. Regarding whitefly under unprotected conditions, the genotypes RCH-138 *Bt* (0.46 adults/leaf), MRC-6301 *Bt* (0.47 adults/leaf) and RCH-138 non-*Bt* (0.41 adults/leaf) and MRC-6301 non-*Bt* (0.42 adults/leaf) supported less population. In protected conditions, the entries RCH-138 *Bt* (0.49 adults/leaf), ANKUR-2534 *Bt* (0.51 adults/leaf), ANKUR-2534 non-*Bt* (0.52 adults/leaf) and RCH-134 non-*Bt* (0.56 adults/leaf) recorded low population. The yield of seed cotton was higher in *Bt* genotypes than their corresponding non-*Bt* genotypes. In *Bt* genotypes, the yield ranged between 13.71 to 27.84 q/ha with an average of 19.78 q/ha and 13.02 to 26.47 q/ha with an average of 18.64 q/ha under unprotected and protected conditions, respectively. In non-*Bt* genotypes the yield ranged between 4.66 to 12.75 q/ha with an average of 8.50 q/ha; 5.34 to 14.39 q/ha with an average of 10.43 q/ha under unprotected and protected conditions, respectively.

Morphological characters and virulence studies of *Fusarium solani* on *Bt* and non-*Bt* cotton genotypes

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ABSTRACT : Mycelial growth of nine isolates varied significantly at six days after inoculation (DAI) and among nine isolates Dharwad farm and Hirebagewadi grew much faster *i. e.* @ 8.60 and 8.40 cm, respectively. Contrary to this, Ron isolate was the slowest growing (7.20 cm). Hirebagewadi, Siruguppa and Sandur isolates produced black and pink colony characters, respectively, and remaining isolates almost similar colony characters like white mycelia. Similarly, the sporulations of *Fusarium* isolates also varied, the heavy sporulations were observed in Mosarkunte, Ron, Siruguppa and Sandur isolates. Ron isolate exhibited least mean per cent germination (60.00%) in two *Bt* (RCH-2 *Bt* and Bunny *Bt*) and one non-*Bt* (RCH-2 non-*Bt*) genotypes, followed by Mosarkunte isolate (66.67%). Overall among three cotton genotypes tested for maximum mean per cent death of seedlings (30 DAS), Ron (47.72%) followed by Naregal (43.02%) Mosarkunte (37.60%) isolates was in two *Bt* (RCH-2 *Bt* and Bunny *Bt*) and one non-*Bt* (RCH-2 non-*Bt*) genotypes.

Feeding potential of aphid lion, *Chrysoperla carnea* Stephen on different preys

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ABSTRACT : The experiment was conducted at Laboratory of Insect Parasitology Research Scheme, Department of Agricultural Entomology, Marathwada Agricultural University, Parbhani during *kharif* 2008. On feeding potential of first, second and third instar larvae of *Chrysoperla carnea* on different preys *viz.*, *Aphis gossypii*, *Aphis craccivora* and *Corcyra cephalonica* revealed that each predator larva consumed 278.90 *Aphis gossypii*, 350.60 *Aphis craccivora* and 265.40 *Corcyra cephalonica*.

Present status of cotton diseases in Marathwada region

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ABSTRACT : The present study was undertaken at various districts of Marathwada region to understand the present status of cotton diseases under jurisdiction of Cotton Research Station, Nanded. The 12-year data on cotton diseases were recorded during 1995-1996 to 2006-2007. The present study confirmed that bacterial blight and alternaria blight as well as grey mildew were the major and predominant diseases of Marathwada region.

Integrated cotton farming improves crop productivity and net profitability in Vidarbha

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ABSTRACT : To make farmers aware and adopt the package of improved cultivation practices through Integrated cotton farming, field trials were conducted in Vidarbha during 2005-2007 crop seasons with cotton hybrids. Emphasis was laid on certified seed, maintenance of soil fertility/plant nutrients, management of insect-pests and plant diseases and proper marketing. The data obtained in this experiment were compared with cotton production obtained in the adjoining fields where farmers cultivated cotton following their traditional practices. The results of the experiment showed that after adopting improved practices, there was an increase of 18.3-30.9 per cent in the yield of seed cotton and 38.4-86.9 per cent in the net profit depending upon rainfed or irrigated situations. Lint quality in terms of staple length improved under irrigation. Therefore, improved practices have been recommended for cotton cultivation under existing cropping patterns in Vidarbha region in central India.

Legume as companion crop for cotton

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ABSTRACT : Cotton, one of the most important natural fibres, plays a dominant role both in agrarian and industrial economy of our country. Monocropping alongwith continuous use of inorganic without addition of organics encouraged pest attacks, which reduced its productivity and profitability, thereby making the sustainability issue, a greater concern even in many traditional cotton areas. Legumes—an essential component in sustainable agro-ecosystems—greatly contribute towards stability in production and profit, pest control, carbon sequestration, organic N addition, soil stabilization and nutrient recycling. Short duration legumes like greengram and blackgram appeared ideal, as these can additionally contribute 5-6 q of grain per hectare with minimal impact on seed cotton yield. Intercropping of greengram (mung) in cotton in 1 : 1, 1 : 2 or 2 : 1 row ratios was beneficial both in yield and economics as reported from several locations in Punjab, Haryana, Andhra Pradesh, Karnataka and Tamil Nadu. In many parts of the country, soybean intercropping in cotton gave a higher gross monetary return per hectare. Study on the multi-tier vegetables including legume, revealed that intercropping of radish, clusterbean and amaranthus planted between paired cotton rows registered higher gross return (Rs. 64,395/ha) and net return (Rs. 34,833/ha) and benefit : cost ratio (2.2) at Coimbatore. Cotton, when grown successively in the same plot without any other crop in the sequence led to less yield of cotton over a period of time. An yield increase to the tune of 11 per cent was recorded in a 2-year cotton-legume-corn rotation as compared to continuous cotton grown without legumes each year. The quantity of N fixed by legumes ranges from 17 to 171/kg per hectare per year. Nutrient management in organic farming solely depends on manures and legumes. Since availability and economical feasibility of using manure is less practicable, *in situ* green manuring with fodder cowpea and its burying at 40 days after sowing will ensure a steady N supply during the grand growth and flowering periods. Living plants and their residue on the soil surface protect the soil from impact of rain drops, reduce soil surface pore blockage and reduce the velocity of running water. Some good insectary plants, often used as cover crops, include alfalfa, sweet clover, vetch, red clover, white clover and cowpeas. Inclusion of forage legumes in cropping system can also be an effective approach to weed control. Insect-pest of 53 per cent showed lower abundance in multiple species mixtures than in sole crops, 18 per cent were more abundant in mixture, 9 per cent showed no difference and 20 per cent were variable in the response. Breeding of short duration, early, determinate, compact and high yielding legumes with suitability to intercropping and sequential cropping in cotton is warranted.