

ABSTRACTS

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Micropropagation of *Gossypium* species

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ABSTRACT : Axillary buds and shoot tips collected from younger seedlings/plants of *Gossypium* spp. gave better response on liquid 1/2 'MS' medium with low concentration of sucrose in micropropagation studies. The addition of phytohormones and full strength 'MS' medium was found to be detrimental for the *in vitro* establishment of explants at initial stages. In meristem culture, phytohormones and CH were found essential for proper development. *G. hirsutum* gave better results for micropropagation than those of *G. arboreum*. Similarly explants excised from younger plants proved better. Addition of phytohormones was essential for activation of axillary buds as well as adventitious root initiation from *in vitro* explants of *Gossypium* species. Plantlets with well developed roots were successfully transferred to the soil.

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Studies on *in vitro* regeneration through shoot tip cultures in cultivated cotton (*Gossypium* spp.)

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ABSTRACT : Regeneration from shoot tip cultures in cotton (*Gossypium hirsutum* L. cv. Abadhita and *G. herbaceum* L. cv. Jayadhar) had been achieved. Only those explants which have developed cotyledons and 2-3 leaves on an average have been considered as responders. The highest response of 90 per cent in Abadhita and 89.7 per cent in Jayadhar has been observed in MS medium containing Naphthalene Acetic Acid (NAA) and benzyladenine (BA) each 0.5 ml/l *in vitro* shoots have roots on MS medium supplemented with 8.0 mg/l. Indole Butyric acid (IBA) or NAA and 0.5 mg/lit BA.

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Studies on isogenic cotton hybrids based on different cytoplasm

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ABSTRACT : Six isolines hybrids which included *hirsutum*, *harknessii* and *aridum* cytoplasm were compared for morphological, fibre and biochemical characters. A male sterile hybrid on *aridum* cytoplasm (CAHH-468) was found to be superior for various characters such as boll weight, number of seed, ginning percentage, seed and lint indices as well as 2.5 per cent span length (CAHH-8). The hybrids on *harknessii* cytoplasm also showed superiority for fibre strength, less number of monopodia and days to 50 per cent flowering (CAHH-8). The CMS hybrid showed higher chlorophyll content (CAHH-8, *harknessii* based) and protein content (CAHH-468, *aridum* based) as compared to GMS and conventional hybrid. The conventional hybrid (AHH-168) gave higher seed cotton yield/plant.

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Magnitude of variability for seed characteristics in desi and American cotton

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ABSTRACT : Studies made with American (*G. hirsutum* L.) and Asiatic (*G. arboreum* L.) cottons for two consecutive years (1992-93 and 1993-94) revealed a wide range of variability for seed index, kernel per cent, hull per cent and germination per cent in both the species. The magnitude of variability was higher in Asiatic cotton than American for kernel per cent, hull per cent and germination per cent whereas for seed index the reverse trend was observed. In *G. arboreum* the genotypes Saraswati, AK 277 and LD 230 for seed index, AK 235 and LD 230 for kernel per cent, Saraswati and accession no. 30814 for hull per cent and AK 277 for germination per cent, whereas in *G. hirsutum* Sima 1 for seed index, LRA 5166 and Sima 1 for kernel per cent, Bikaneri narma and C 1412 and for hull per cent SRT-I and Suman for germination per cent, were found to be promising for improving seed quality attributes.

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Genetic components of variation in upland cotton (*G. hirsutum* L.) under natural bollworm infestation

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ABSTRACT : A ten parent diallel crosses (with out reciprocal) involving bollworm tolerant donor lines of *G. hirsutum* L. were studied for component of variance analysis for nine characters. Both additive and dominance gene action were important for all the traits except for ginning percentage, boll and locule damage. However the role of dominance can not be ignored for all the traits studied. The study also indicated complete dominance for days to 50 per cent flowering and number of bolls per plant and overdominance for boll damage, locule damage, ginning percentage, boll weight, seed index, lint index and seed cotton yield per plant. Epistasis was detected for boll damage, locule damage and ginning percentage. Some form of reciprocal recurrent selection was suggested for exploiting all the three types of gene action for developing high yielding bollworm tolerant lines with built in resistance.

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Effect of levels of phosphorus, its time and method of application on yield, nutrient uptake and quality of fibre on *G. hirsutum* cotton under irrigation

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ABSTRACT : Studies were conducted to find the effect of phosphorus levels, its time and method of application on yield, nutrient uptake and quality of *G. hirsutum* cotton under irrigation, at the Cotton Project, M. P. K. V., Rahuri (M. S.) during 1987-88, 1988-89 and 1989-90. The pooled data did not indicate any response to higher doses of P_2O_5 and yields of seed cotton obtained due to different levels of P_2O_5 did not differ significantly. However, higher yields of seed cotton were obtained due to placement of full dose of P_2O_5 at the time of planting at 7.5 cm soil depth. The nutrient uptake studies revealed that uptake of P when applied as full dose at sowing at 7.5 cm deep in soil was more. The nitrogen utilization was better where uptake of P was more. Application of P did not influence much on 'K' in soil as well as in

plant. Application of P_2O_5 improved significantly the strength of fibre with slight improvement in the length of fibre while the time and methods of P_2O_5 application did not indicate any effect on any of the fibre properties.

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Determination of critical period of crop-weed competition in summer irrigated *Gossypium hirsutum* L. cotton var. Kop-498

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ABSTRACT : Studies were conducted to determine the critical period of crop-weed competition in summer irrigated cotton during 1991-92, 1992-93 and 1993-94 at Mahatma Phule Krishi Vidyapeeth, Rahuri (Maharashtra). The data for three consecutive years showed that the critical period for crop-weed competition in summer cotton was upto 60 days after sowing. The yields of seed cotton were maximum in the treatment of crop to be kept weed free upto harvest which were at par with 4 weedings at the interval of 15 days upto 60 days after sowing. Thus critical period of crop-weed competition in summer irrigated cotton crop was observed to be upto 60 days after sowing.

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Use of botanicals and biopesticides in cotton pest management system

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ABSTRACT : To evaluate the bio-efficacy of biopesticides (Bt and neem) and their alternate use with synthetic insecticides in a spray schedule for the management of bollworms on upland cotton *Gossypium hirsutum* var. Pusa 31, field trials were conducted at IARI, New Delhi, during 1992 to 1994 crop seasons. The impact of insecticidal sprays on population build-up of whitefly was noted after termination of spraying. Application of Bt and neem alone or used alternatively with each other or with conventional synthetic insecticides failed to suppress bollworm complex in cotton under field conditions. Satisfactory control of bollworm complex and increase in cotton yield were observed by applying Bt and neem at alternate turns with synthetic insecticides comprising one spray of synthetic pyrethroid. This strategy will reduce the use of synthetic insecticides upto 60-70 per cent and is also safe to the environment with no problem of whitefly resurgence.

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Adoption of insect-pest control practices by Haryana farmers in cotton-A survey

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ABSTRACT : A survey was conducted to assess the adoption of insect-pest control practices by the farmers of cotton growing belt comprising of Hisar, Sirsa and Bhiwani districts of Haryana during October, 1994. It was found that about two-third farmers applied 5 to 7 sprays on cotton. Monocrotophos was the most commonly used insecticide and 56 per cent of the total sprays had this insecticide either alone or as combinations with other insecticides. Among contact insecticides fenvalerate and cypermethrin were the most widely used and most of the farmers used more than the recommended dosages of these insecticides. Quantity of water used by the farmers was always less than the

recommended one. About 50 per cent farmers followed the recommended spray interval or 12 to 15 days while about one-third of them adopted a shorter spray interval of 7 to 10 days. More than 75 per cent farmers used the manually operated knap-sack sprayer for spraying the crop, but in Sirsa district about 40 per cent farmers used power sprayers. More than 55 per cent farmers sought advice from pesticide dealers/commission agents for deciding what to spray while less than 15 per cent consulted government agencies in this regard. About 50 per cent farmers could control the pests effectively.

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Control of *Rhizoctonia* species causing root rot of cotton (*Gossypium* species) using fungicides as seed treatment

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ABSTRACT : Six fungicides were tested against mixed inocula of *Rhizoctonia solani* Kuhn and *Rhizoctonia bataticola* (Taub.) Butler [*Macrophomina phaseolina* [Tassi.] Goid] causing root rot in three varieties/hybrid of cotton (HS-6, HD-107 and HHH-81) by conducting experiments as seed treatment (wet and dry methods). The root rot was found less with the use of carbendazim in all the experiments whether in screenhouse in soil infested with test pathogens or in sick plots. The carboxin fungicide also gave good control of this disease during experimentation. The seed treatment with fungicides by dry method proved superior over wet methods under both the screen house as well as sick plot conditions. The root rot was found less in seed treatment with fungicides under field conditions than under screenhouse conditions.

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Bacterial blight disease situation in cotton grown with intercrops

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ABSTRACT : In a study on bacterial blight disease in cotton AKA-8401 and PKV-Rajat (AKH-84635) grown with different intercrops viz. Green Gram, Black gram, Groundnut and Soybean during 1992-1993 to 1995-96, conducted at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola it was observed that the bacterial blight incidence did not differ significantly. However significant results as regards disease intensity were observed during 1995-96 season only, where lowest disease intensity i. e. 17.43 per cent was recorded in cotton grown with soybean as intercrop. The highest disease intensity i. e. 22.88 per cent was recorded in cotton (PKV-Rajat) without intercrop. The differences amongst cotton+green gram and cotton+black gram were at par to each other.

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Integrated management of dry root rot of cotton incited by *Macrophomina phaseolina* (Tassi.) Goid

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ABSTRACT : Field experiments were conducted at Cotton Research Station, Srivilliputtur, Tamil Nadu to explore the possibility of integrating antagonist and soil organic amendments for the management of cotton dry root rot disease caused by *Macrophomina phaseolina* (Tassi.) Goid. Among the treatments, seed treatment with *Trichoderma viride* talc-formulation @ 4 g/kg seed plus soil application of neem cake @ 250 kg/ha was found most effective in reducing the mean disease incidence to a minimum of 4.6 per cent as against the maximum of 27.3 per cent in control. The combination of antagonist and organic amendments also significantly increased plant growth, yield attributes and seed cotton yield.

Effect of ethylene urea formaldehyde, melamine formaldehyde and acrylic finishes on elastic recovery of cotton and its blends

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ABSTRACT : The presence of resin finishes (ethylene urea formaldehyde and melamine formaldehyde) and acrylic (Tx50) finish in dry condition influenced the elastic recovery differently with fibre contents. Increase in elastic recovery was seen in cotton and it became less and less in polynosic and polynosic-viscose containing fabrics. These differences were not observed in wet condition as the finishes attributed to the higher amorphous regions in the cellulosic fibres, other than cotton. Thus, resin finishes increased the elastic recovery. Acrylic (Tx50) finish being lubricating type and hygroscopic, behaved differently from resin finish. Water did not have any special influence and thus the effect was seen in both immediate as well as delayed recovery.