

Journal of Plant Development Sciences

(An International Monthly Refereed Research Journal)

Volume 9

Number 1

January 2017

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COMBINING ABILITY ESTIMATION FOR MORPHOLOGICAL AND YIELD CONTRIBUTING CHARACTERS IN *DESI* COTTON (*GOSSIPIMUM ARBOREUM*)

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Received-14.01.2017, Revised-26.01.2017

Abstract: In the present study six arboreum lines (PA-720, PA-08, PA-528, PA-532, PA-255 and PA-402) were crossed with four testers (AKA-7, GAM-162, Dwd-arb-10-1 and JLA-802) to obtain twenty four hybrids following line × tester design. The resultant twenty four hybrids along with their parents were evaluated in a randomized block design with three replications at Cotton Research Station, Mahboob Bagh Farm, Vasantrya Naik Marathwada Krishi Vidyapeeth, Parbhani during *kharif* 2012-13. Observations were recorded on twelve parameters *viz.*, days to 50% flowering, days to 50% boll bursting, no. of sympodia per plant, no. of bolls per plant, no. of seeds per boll, boll weight, plant height, days to maturity, seed cotton yield per plant, lint yield per plant, seed index and oil content. The combining ability analysis indicated the presence of considerable variability in crosses for most of the traits under study. The lines *viz.*, PA-720, PA-08 and PA-532 and the tester AKA-7 was found the best general combiner. The crosses *viz.*, PA-528 × AKA-7, PA-528 × JLA-802 and PA-08 × AKA-7 showed significance of SCA effects for more number of traits so these can be used for future breeding programmes. The variance estimates due to GCA and SCA were highly significant for most of the characters. The magnitude of SCA variance was greater than GCA variance and more contribution of line × tester interaction to the total variability indicated the predominance of non additive gene action, so for improvement of these traits heterosis breeding is considered the more rewarding option.

Keywords: *Gossipium aborem*, Seed, Cotton

EFFECT OF INTEGRATED NUTRIENT MANAGEMENT ON GROWTH DYNAMICS AND PRODUCTIVITY TREND OF WHEAT (*TRITICUM AESTIVUM* L.) UNDER IRRIGATED CROPPING SYSTEM

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Received-09.01.2017, Revised-20.01.2017

Abstract: A field experiment was conducted during rabi season of 2011-13 at C.S. Azad University of Agriculture and Technology, Kanpur, in randomized block design with three replication to assess the effect various type of organic, inorganic and bio-fertilizers on growth attributes, yield and their relationship acquisition. The 10 treatments were tested in RBD design. T1-Control, T2 - RDF (150:60:40 NPK Kg/ha), T3 - 125% RDF, T4 - RDF + Vermicompost @2.5 t/ha, T5 - RDF + Vermicompost @ 5t/ha, T6 - RDF + FYM @ 5t/ha, T7 - RDF + FYM @ 10t/ha, T8 - RDF + Vermicompost @2.5 t/ha + Azotobacter, T9 - RDF + FYM @ 5t/ha + Azotobacter, and T10 - RDF + Vermicompost @ 2.5 t/ha + FYM @ 5 t/ha + Azotobacter. Different levels of vermicompost and NPK fertilizers showed significant effect on growth attributes and yield contributing characters of wheat. Results showed that application of chemical fertilizer with organic manures gave the maximum yield. Combined application of organic manures and inorganic fertilizers increased the dry matter accumulation, leaf area index, no of tillers and yield by wheat compared to treatments T2, T3 where only chemical fertilizer applied through urea, dia ammonium phosphate and murate of potash. The highest grain and straw yield of wheat to the extent of 56.2 and 75 q/ha respectively was obtained where FYM, vermicompost, bio-fertilizer and recommended dose of NPK was applied in the rate of 100% RDF + Vermicompost @ 2.5 t/ha + FYM @ 5 t/ha + Azotobacter, respectively. The results of the experiment indicated that combined application of inorganic fertilizer along with FYM, vermicompost and bio-fertilizer gave significantly improvements in growth parameters and productivity trend of wheat.

Keywords: Management, Productivity, Cropping system, Wheat

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INFLUENCES OF SPACING AND WEED MANAGEMENT PRACTICES ON YIELD AND ECONOMICS OF WET DIRECT SEEDED RICE (*ORYZA SATIVA* L.)

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Received-14.01.2017, Revised-25.01.2017

Abstract: A field experiment was conducted during *kharif* season of 2014-15 at the Research cum Instructional Farm, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). The experiment was laid out in randomized block design comprises of eleven treatments with three replications. Among the spacing 20×10 cm and 20×20 cm, the effective tillers m⁻², total grains panicle⁻¹, filled grains panicle⁻¹ were significantly higher at 20×20 cm with respective level of weed management. However, hand weeding twice and herbicidal weed management was at par with both spacing. Among the spacing 20×10 cm and 20×20 cm, At spacing 20×20 cm, bidirectional mechanical weeding thrice (T₁₀) produced the maximum grain (49.12 q ha⁻¹) and straw yield which was at par with bidirectional mechanical weeding twice. Among the spacing 20×10 cm and 20×20 cm, the grain and straw yield was at par with respective level of weed management. Among different spacing and weed management practices the higher gross return (₹ 69,759 ha⁻¹) obtained under bidirectional mechanical weeding thrice. However, the maximum net return (₹ 38,565 ha⁻¹) and benefit cost ratio (2.61) were obtained at spacing 20×20 cm with herbicidal weed management (Pyrazosulfuran as pre-emergence followed by Bispyribac-Na as post emergence).

Keywords: Management, Rice, Seed, Weed, *Kharif* season

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EFFECT OF PRE AND POST EMERGENCE APPLICATION OF DIFFERENT DOSES OF IMAZETHAPYR ALONG WITH OTHER HERBICIDES ON NUTRIENT UPTAKE BY CROP AND WEEDS

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Received-17.01.2017, Revised-26.01.2017

Abstract: A field experiment was conducted during the rabi season of 2012-13 and 2013-14 at Crop research center, Chirodi, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut U.P. to study the “Effect of pre and post emergence application of different doses of imazethapyr along with other herbicides on weed dynamics, yield of black gram and succeeding mustard crop”. The soil of experimental field was sandy loam in texture, low in organic carbon and available nitrogen, medium in available phosphorus and available potassium with near to neutral in reaction. The experiment consisted of 10 treatment combination with pendimethalin @ 1000 g ha⁻¹ as pre-emergence (T₁), Imazethapyr @ 50 g ha⁻¹ at 3-4 leaf stage (T₂), Imazethapyr 70 g ha⁻¹ at 3-4 leaf stage(T₃), Imazethapyr + pendimethalin @ 800 g as pre-emergence(T₄), Imazethapyr+pendimethalin @ 900 g ha⁻¹ as pre-emergence(T₅), Imazethapyr+ pendimethalin @1000 g ha⁻¹ as pre-emergence(T₆), Imazethapyr + imazamox @ 60 g ha⁻¹at 3-4 leaf stage(T₇), Imazethapyr + imazamox @ 70 g ha⁻¹ at 3-4 leaf stage(T₈), Two hand weeding at 20 & 40 DAS (T₉) and weedy check (T₁₀). The treatments were replicated three times in a randomized block design. All weed control practices proved effective in controlling the weeds in black gram and gave significantly higher grain yield over weedy. PRE application of imazethapyr + pendimethalin (RM) at 900 g ha⁻¹ most effective control of all major weeds, resulting maximum grain yield among herbicide treatments which was at par with and PRE use of pendimethalin at 1000 g ha⁻¹ provided control of weeds with slight crop suppression which although mitigated within 10-15 days after spray resulting reduction in grain yield. This treatment influenced the uptake of nutrient by black gram and reduced density and dry matter of weeds.

Keywords: Weed control, Herbicide, Weed, Black gram, Mustered

EFFECT OF LAND CONFIGURATION METHODS AND SULPHUR LEVELS ON GROWTH, YIELD AND ECONOMICS OF INDIAN MUSTARD [*BRASSICA JUNCEA* L.] UNDER IRRIGATED CONDITION

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Received-07.01.2017, Revised-18.01.2017

Abstract: A field experiment was conducted at Varanasi, during *rabi* season of 2015-16, to study the effect of land configuration and sulphur levels on yield attribute, yield and economics of Indian mustard [*Brassica juncea* (L.)] on a sandy clay loam soil at Agriculture research farm, Institute of Agricultural Sciences, B.H.U., Varanasi, U.P. The investigation was carried out in a split plot design with 3 replications. The treatment comprised of four land configuration methods (-M₁ - Flat bed broadcasting - M₂ - Furrow sowing M₃ - Flat line sowing and M₄ - Ridge side sowing) as main plot factor and four sulphur levels (control, 20 kg S ha⁻¹, 30 kg S ha⁻¹, 40 kg S ha⁻¹) as sub plot factor. Furrow sowing was significantly superior over other land configuration methods in terms of growth parameter, yield attributes and yield as well as economics of crop cultivation. The different levels of sulphur showed a positive response on influencing the growth attributes, yield attributes and yield of mustard. The application of 40 kg S ha⁻¹ was significant over other sulphur levels in terms of growth parameters, yield attributes and yield and profitability of mustard crop cultivation.

Keywords: Economics, Growth and yield, Land configuration, Indian mustard, Sulphur levels

EFFICACY AND ECONOMICS OF NEWER INSECTICIDES AGAINST YELLOW STEM BORER, *SCIRPOPHAGA INCERTULAS* WALKER IN BASMATI RICE

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Received-11.01.2017, Revised-24.01.2017

Abstract: This investigation was conducted during *kharif* 2014 and 2015 at crop research centre, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, U.P., India. Among all the treatments, chlorantraniliprole 18.5 SC was found most effective and minimum cumulative infestation of *S. incertulas* with 2.73 per cent DH and 2.06 per cent WE recorded after first and second spray, respectively. Whereas, among the treatments the maximum dead hearts (6.18 %) and white ears (7.47 % WE) infestation were recorded from chlorpyrifos 50 + cypermethrin 5 EC (Treated check). The untreated control was recorded with maximum dead hearts (9.50 % DH after first spray) and white ears (8.67 % after second spray) infestation. The maximum yield (44.58 q/ha) was recorded from chlorantraniliprole 18.5 SC, whereas the highest cost benefit ratio (1:12.56) was calculated in fipronil 5 SC. Among all the treatments, the minimum yield (37.60 q/ha) was recorded from chlorpyrifos 50 + cypermethrin 5 EC and lowest cost benefit ratio (1:1.57) calculated from the treatment novaluron 10EC.

Keywords: Insecticide, *Kharif*, Basmati rice

PRODUCTIVITY OF RICE, WHEAT AND N REMOVAL BY RICE AS INFLUENCED BY ORGANIC AND INORGANIC SOURCES OF NITROGEN IN RICE AND THEIR RESIDUAL EFFECT ON SUCCEEDING WHEAT CROP

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Received-11.01.2017, Revised-21.01.2017

Abstract: Soil health is towards deteriorating because of continuous use of chemical fertilizers keeping in view experiment were conducted on Integrated nutrient management with different treatment of Prilled Urea, FYM and Green manuring in rice crop and its effect on succeeding wheat crop. The experimental field having pH 7.9 (1:2.5 soil and water), cation exchange capacity 11.1 Cmol (p⁺) kg⁻¹ and available N, P and K 165.5, 60 and 90.1 kg ha⁻¹ respectively. Experiment were laid out in RBD with ten treatment combinations in four replications on rice Variety Pant-10 and Wheat var. K-8804. It is revealed that the addition of green manuring proved superior to FYM in terms of yield and their parameters of rice crop. On an average highest total uptake (128.90 q ha⁻¹) was recorded in treatment T₅ (N 60 through PU + N 60 through GM) followed by T₄ (120 kg N ha⁻¹ through PU) i.e. 123.52 kg ha⁻¹.

Keywords: FYM, Green manure, Productivity, Wheat crop

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EFFECT OF HOST RANGE AND DATES OF SOWING OF BACTERIAL BLIGHT OF RICE PATHOGEN

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Received-08.01.2017, Revised-22.01.2017

Abstract: Host range study revealed that BLB can produce visible symptoms on *Cyperus rotundas*, *Cynodon dactylon*, *Paspalum scrobiculatum*, *Leersia oryzoides* and *Oryza sativa* and symptoms were not appeared on *Zea mays*, *Sesamum indicum*, *Vigna radiate*, *Vigna mungo* and *Glycin max*. However, five out of ten hosts plant take 48-58 hours to symptoms expression.

Keyword: Bacterial leaf blight, *X. oryzae* pv. *Oryzae*, Host range, Date of sowing

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BALANCE FERTILIZATION FOR HIGH SUSTAINABLE RICE (*ORYZA SATIVA* L.) YIELD AND QUALITY IN CENTRAL ALLUVIAL SOILS OF UTTAR PRADESH

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Received-04.01.2017, Revised-15.01.2017

Abstract: The pot experiment was conducted at soil science laboratory of C. S. Azad University of Agriculture & Technology, Kanpur with 150kg N+ 75kg P₂O₅+ 75kg K₂O ha⁻¹ in rice crop during kharif 2011. The other treatments included the 125% increased doses of above and sulphur (60 kg ha⁻¹) and zinc (5 kg ha⁻¹) were added since the experimental soil was deficient in these two nutrients. Mustard was grown after rice on the residual nutrients of the same treatments with application of 80 kg N ha⁻¹ uniformly. The results revealed that rice yields varied from 49.0 to 73.0 q ha⁻¹ and NPK raised by 125% with 60 kg S ha⁻¹ and 5kg Zn ha⁻¹ gave the highest yields. The starch content varied from 65 to 71%, amylose from 27 to 34% and amylopectin from 66 to 73%. The treatment T₈ (187.5N + 93.75 P₂O₅ + 93.75 K₂O + 60 S + 20 Zn Kg ha⁻¹) gave the best result in terms of yield and crop quality.

Keywords: Balanced fertilization, Rice yield, Starch, Amylose, Amylopectin

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ESTIMATION OF GENETIC VARIABILITY AND CORRELATION ANALYSIS IN FIELD PEA (*PISUM SATIVUM* L.) GENOTYPES

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Received-12.01.2017, Revised-23.01.2017

Abstract: An experiment was undertaken to study genetic variability and correlation analysis in 20 genotypes of pea (*Pisum sativum* L.) on the experimental field at Department of Genetics and Plant Breeding, Rajasthan College of Agriculture during Rabi, 2014. The genotypes were tested under irrigation condition in randomized block design with three replications. Analysis of variance revealed significant differences for six characters studied among the genotypes. The *per se* mean performance of various genotypes exhibited wide range of variation for most of the traits studied. According to mean performance of various traits viz. seed yield per plant, days to maturity and pod per plant, seed per pod was found superior for selection. The highest genotypic coefficient of variation was observed primary branches per plant followed by seed yield per plant, pod per plant, and seed per pod. Heritability estimates (broad sense) were found to be high for days to maturity followed by yield per plant, seed per pod, and pod per plant. High expected genetic advance coupled with high heritability estimates were recorded for seed yield per plant and days to maturity. The both genotypic and phenotypic levels for pod per plant and seed per pod were significantly correlated with seed yield/plant., Heritability coupled with high genetic advance and correlation also useful tool in predicting the effect in selection of best genotypes for future hybridization in yield improvement programme of pea.

Keyword: GCV, PCV, Heritability, Genetic advance, Correlation

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CHARACTERIZATION OF FLY ASH COLLECTED FROM NATIONAL THERMAL POWER PLANT

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Received-18.01.2017, Revised-25.01.2017

Abstract: In this study fly ash collected from the National Thermal Power Corporation (NTPC) Sipat, Bilaspur (C.G.) was characterized for its physical and chemical properties. The fly ash is slightly alkaline in reaction and very low organic carbon content. The presence of various heavy metals elements was in the order of Cr > Pb >Co> Ni. The DTPA extractable micronutrients were in the order of fe>Mn>Zn>Cu where as total N, P, K show the trend as N>K>P. Fly ash used for enhanced crop production depending upon the nature of soil and fly ash.

Keywords: Fly ash, FYM, Macro, Micronutrients