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Contents

SHORT COMMUNICATION

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NANOTECHNOLOGY: APPLICATION IN THE FIELD OF AGRICULTURE

Hem. C. Joshi[1]*, Alok Sukla[1], S.K. Guru[1] ,K.P. Singh[2], Prashant Singh[3]

[1]Department of Plant Physiology, College of Basic Sciences and Humanities, G.B.P.U.A & T Pantnagar, U.S.Nagar (263145), Uttrakhand, India
[2]Membrane Biophysics and Nanobiosensor Research Laboratory, College of Basic Sciences and Humanities, G.B. Pant University of Agriculture and Technology, Pantnagar, Udham Singh Nagar -263145, India.
[3]Department of Biotechnology, Bhimtal Campus, Kumaun University, Nainital, Uttarakhand, India
Email: hembiophysics12@gmail.com

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Abstract: Indian agriculture, passing through various revolutions ,has made appreciable achievement in terms of production & productivity ,availability of food grains, horticultural produce,milk,meat & fish which has been possible through technological interventions and critical role played by Indian council of agriculture research (ICAR) .although are continue to be the same to 40million hectares for the last 40 years, production has increased apparently .the production of food crop has increased 4.5 times ,many of the crops which were not known before, have emerged as important, and we have become leader. Despite numerous challenges and short comings the horticulture has exhibited impressive growth. If Indian agriculture has to attain its board national goal of sustainable growth, it is important that the nanotechnology research is extended to the total agricultural production consumption system that is across the entire agricultural value chain. Nanotechnology in agriculture could be used for enhancing the efficiency of the technologies; this includes nanoparticle based disease diagnostics, nano-insecticides for insect pest control, nano-formulation for nutritional studies & various other aspects.Nanomanufacturing makes Nanoscale building blocks including nanoparticles, nanotubes &nanostructures.Nanoparticle can be formed by either milling of large particle or by directly chemical synthesis.however carbon nano tubes and most nanoparticle are synthesized directly from liquid or vapor phases.Chemical & physical vapor phase synthesis is well-established technologies for large scale production of metal, metal oxide and ceramic nanoparticles.The recent development in plant science that focused on the role of nanoparticle in plant growth & development and also on plant mechanism.

Keywords: NPs (nanoparticles), QDs (quantum dots), CNTs (carbon nanotubes), MWCNTs (multi-walled-CNTs)

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MOLECULAR METHODS FOR PLANT TAXONOMY

Vinay M. Raole* and Nagesh Chirumamilla

Department of Botany, Faculty of Science
The Maharaja Sayajirao University of Baroda, Vadodara-390002
Email: vinaysar@rediffmail.com

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Abstract: Molecular systematics is the use of molecular genetics to study the evolution of relationships among individuals and species. The goal of systematic studies is to provide insight into the history of groups of organisms and the evolutionary processes that create diversity among species. There are two separate tasks to which DNA specificity is currently being applied. First one DNA data used to distinguish between species which is equivalent to species identification and the second one to discover new species. The aim of this review is to present the techniques that are available to a taxonomist to complement the conventional field methods of identification and delineation of plant species.

Keywords: Genetic diversity, PCR, AFLP, DNA Barcode

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DROUGHT AND SALINITY STRESS IN CROP PLANTS

Ravi Kumar[1]* and Lakshyadeep[2]

[1]Research scholar, Department of Plant Breeding and Genetics, SKNCOA, Jobner.
[2] Department of Plant Breeding and Genetics, MPUAT, Udaipur.
Email: bishnoiravi@ymail.com

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Abstract: Abiotic stress is a condition deviated from normal conditions which is mainly produced from the abiotic environmental factors or non living components. These factors affect the crop plants adversely via reducing growth and production. These non living components of environment are drought (water stress), water logging, extremes of temperature (high and low), high salinity/alkalinity, high acidity nutrient toxicity *etc*. Temperature (high and low), salinity stress and drought are major abiotic factor which affect much as compare to others non living factors. Abiotic stress severely limits plant growth and development, due to that final yield is reduced.

Keywords: Drought, Crop plants, Abiotic factor, Production

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APPLICATION OF NANOTECHNOLOGY TO PLANT BIOTECHNOLOGY

Nayan Tara[1] and Meena[2]*

[1]Department of Bio and Nanotechnology, Guru Jambeshwar University of Science and Technology, Hisar (Haryana)125004
[2]Microbial Resource Technology Laboratory, Department of Microbiology Kurukshetra University, Kurukshetra (Haryana) 136119
Email: meenasindhu20@gmail.com

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Abstract: Nanotechnology is one of the most fascinating and promising science field having ability to transform research in different disciplines of science such as agriculture, medicines, diagnostics and even plant tissue culture. Plant tissue culture is one of the fundamental techniques of plant biotechnology. It not only involved in the micropropagation of endangered plant species but also provide aseptic explants for transformation. But plant tissue culture technique have plethora of methodological obstacles which prevent its full exploitation, such as contamination of explants. This paper mainly presents a review on uses of nanomaterials in plant tissue culture such as decontamination of plant tissue culture and role of NPs in intracellular delivery of biomolecules such as enzymes, proteins and DNA in plant cells.

Keywords: Nanoparticles, Decontamination, Intracellular delivery, Plant transformation

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BIOACTIVE POLYSACCHARIDES FROM WILD MUSHROOM*, COPRINOSIS* SP.

Hemanta Kumar Datta and Sujata Chaudhuri*

Mycology & Plant Pathogy Laboratory, Department of Botany, University of Kalyani, Kalyani, PIN:741235
Email: sujatachaudhuri@gmail.com

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Abstract: The wild mushroom *Coprinosis* sp., was collected from local forest and water soluble fraction of the polysaccharide was extracted from the fruiting body. The polysaccharide (CPSS) was partially purified by dialysis. Biochemical estimation of crude extract shows that it contained 90.7% polysaccharides, 8.92% phenolics and 0.28% protein.

FTIR spectroscopy further confirmed the presence of polysaccharides. HPLC analysis of CPSS indicated that glucose, galactose and xylose comprised monosaccharide units. Total antioxidant, total reducing power, nitric oxide scavenging and DPPH assay confirmed antioxidant property of CPSS and it was found to work in a dose dependent manner. DCFDA stained images of lung cancer line A549 showed that CPSS was able to reduce intracellular ROS in the cells. Cytotoxicity of CPSS was observed on A549 and L132 cell. It showed that CPSS had potential antitumor activity and it was specific to cancer cells only. Hochest and PI staining indicated the induction of apoptosis in cancer cell by PI positive cells after CPSS treatment.

Keywords: Wild mushroom, Polysaccharides, Antitumour, Antioxidant

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MYCOTOXIN RESEARCH AND MYCOFLORA IN SOME DRIED EDIBLE MORELS MARKETED IN JAMMU AND KASHMIR, INDIA

Pinky Bala, Dimple Gupta and Y.P. Sharma*

Department of Botany, University of Jammu, Jammu- 180006, India
Email: yashdbm3@yahoo.co.in

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Abstract: *Morchella* species are major wild edible mushrooms of Jammu and Kashmir, which is both exported as well as largely consumed domestically. The aim of the present study was to characterize the toxigenic moulds and to screen different mycotoxins in dried morels. The most commonly isolated fungi were species of *Aspergillus*, *Fusarium* and *Penicillium* and the important mycotoxins detected were aflatoxins, citrinin, ochratoxin and zearalenol. The mean level of aflatoxin B_1 (125.44± 78.14) was found to be highest among all other mycotoxins. This is the first report on mycoflora and mycotoxin contamination in dried morels from Jammu and Kashmir.

Keywords: *Aspergillus*, *Morchella*, Mycotoxin, Mycoflora

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EFFECT OF DIFFERENT CONCENTRATION OF IBA ON ROOTING OF PLUM (*PRUNUS DOMESTICA* L.) CUTTINGS CV. SANTA ROSA UNDER VALLEY CONDITION OF GARHWAL HIMALAYA

Kranti Kumar Lalhal, Tanuja, D.K. Rana and Dinesh Chandra Naithani*

Orchard Section, Horticultural Research Centre and Department of Horticulture, School of Agriculture and Allied Science, H.N.B. Garhwal University (A Central University), Srinagar (Garhwal)-246174, Uttarakhand, India

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Abstract: A field investigation entitled **"Effect of Different Concentration of IBA on Rooting of Plum (*Prunus domestica* L.) Cuttings cv. Santa Rosa under Valley Condition of Garhwal Himalayas"** was conducted during winter season 2015-16 at orchard Section, Horticultural Research Centre and Department of Horticulture, H.N.B. Garhwal University (A Central University), Srinagar Garhwal, Uttarakhand, India. The cuttings treated with 2500 ppm IBA showed the maximum number of sprouted cuttings (6.67), minimum number of un-sprouted cuttings (1.67), minimum number of dead cuttings (1.66), maximum number of sprout (10.53), length of sprout (20.66 cm), diameter of sprout (0.41 cm) number of leaves on new shoots (81.90 cm), maximum percentage of rooting (73.33 %), number of primary roots (42.80), number of secondary roots (91.40), length of longest root (28.12 cm), diameter of thickest root (0.21 cm), fresh weight of roots (1.88 gm) and dry weight of roots (1.02 gm). On the basis of result achieved in the present study, it can be concluded that among the different concentration of IBA, IBA @ 2500 ppm may be suggested for best shoot and root growth of plum cv. Santa Rosa under valley condition of Gharwal Himalaya.

Keywords: Cutting, Diameter, Rooting, Percentage, Investigation, *Prunus domestica*

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STUDIES ON COMBINING ABILITY IN FORAGE SORGHUM FOR YIELD AND QUALITY PARAMETERS

Akash Singh and S.K. Singh*

Department of Genetics and Plant Breeding
Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut - 250 110
Email: shivkumar301968@gmail.com

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Abstract: Estimates of variance among line with respect to gca was found highly significant for all the attributes and variance among testers with respect to gca was recorded highly significant for all the traits except stem girth. The variances among crosses due to interaction between lines x testers genotypes with respect to sca were expressed highly significant for all the characters except stem girth and number of leaves per plant. Average degree of dominance $(\delta^2_s/\delta^2_g)^{0.5}$ exhibited partial dominance for plant height, leaf length, leaf breadth, internode length, leaf area, leaf stem ratio and green fodder yield and over dominance was observed for days to 50% flowering, number of leaves per plant, stem girth, total soluble solids and protein content. GCA effects and *per se* performance among the parents HC260, Pusa Chari23, SPV815, Pusa Chari6, HC260 and HC171 were found to be as good general combiner and the F_1's hybrids *i.e.* HC260 x HC308, HC260 x G48, SSG-59-3 x G48, HJ513 x HC308, HJ513 x HC171, ICSV700 x HC308, UP Chari2 x G48, UP Chari1 x Pant Chari6, Pusa Chari9 x HC171 and Rajasthan Chari1 x G48 were identified with significant and positive SCA for fodder yield which may be utilized for obtaining transgressive segment in the next generation and also could be exploited for development of hybrids.

Keywords: *Sorghum bicolor*, Gene action, Combining ability, Quality parameters

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TRADITIONAL AGROFORESTRY SYSTEMS IN GARHWAL HIMALAYA

Ram Gopal[1]*, R.S. Bali[2], D.R. Prajapati[3] and D.U. Rathod[4]

[1]Botany Division, Forest Research Institute, Dehradun,Uttrakhand.
[2]College of Forestry Ranichauri, Uttarakhand
[3]Navsari Agricultural University, Gujarat
[4]Silviculture Division, Forest Research Institute, Dehradun, Uttarakhand
Email: rgksikar@gmail.com

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Abstract: The study was carried out for documentation of agrobiodiversity in traditional agroforestry systems in Garhwal Himalaya, Uttarakhand. A total of nine villages were taken for the study from the different geographical regions and were categorized into three different elevation ranges.The predominant agroforestry systems were found *viz.* agrisilviculture, agrisilvopastural and silvipastural system. In agrisilviculture system total 30 species were documented. In agrisilvopastural system (home garden) total53 species were documented among them *Trichosanthes dioica*, *Mangifera indica*, *Vitis vinifera*, *Emblica officinalis*, *Carica papaya*, *Prunus amygdalus*, *Annona squamosa*, *Annona reticulate* and *Artocarpus heterophyllus* were newly documented species. In silvipastural system about 27 species of tree, shrub and grass species are documented with livestock unit. In three agroforestry systems some new species were documented due to adaption of changing climate and different traditional farming practices.

Keywords: Agroforestry, Agrisilviculture, Homegarden, Silvipasture

GROWTH PERFORMANCE OF RUBBER (*HEVEABRASILIENSIS* MUELL. ARG.) PLANTATION IN HILLY ZONE OF KARNATAKA

Shahbaz Noori* and S.S. Inamati

Department of Silviculture and Agroforestry
College of Forestry, Sirsi (UASD) - 581401
Email: shabaznoori12@gmail.com

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Abstract: The objective of this experiment was to assess the influence of site factors on growth and productivity of *Hevea brasiliensis* clone RRII 105in different aged rubber plantation in Hilly zone of Karnataka. Hilly zone was classified into two ecological zones based on annual rainfall distribution *viz.*, Mundgod (798 mm) and Sagara (1918 mm).Seasonal diameter increments during monsoon (June-September) and winter (October-December) was higher and declined subsequently in summer (January-March) in all age gradation. The volume production and productivity was observed to be double in Sagara for all the age gradation in comparison with Mundgod due to maximum DBH, tree height, favourable climatic conditions, moderate soil fertility status and lesser temperature extremes prevailing in zone.

Keywords: Age,girth increment, Productivity, Site factor, Hilly zone

YIELD MAXIMIZATION OF HYV AND SCENTED VARIETIES OF RICE

D.K. Gupta* and V.K. Singh

RMD College of Agriculture & Research Station, Ajirma, Ambikapur, Surguja (Chhattisgarh) – 497001 email id.: gupta_dinesh11@yahoo.co.in
Department of Agronomy,
Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.), 492 012 India

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Abstract: The field experiment on "Yield maximization of HYV and scented varieties of rice" was conducted during *kharif* seasons of 2015 at the Research Farm, IGKV, RMD College of Agriculture & Research Station Ambikapur, Surguja (Chhattisgarh). In experiment first the main plot consisted two treatment of varieties *viz.* Chandrahasni (V_1) and Bamleshwari (C_2). While the sub- plot consisted of seven treatments of nutrient management *viz.* N_1- 20×10 cm with RDF(120:60:40 NPK kg/ha), N_2- 20×10 cm with 125% RDF(10% N at flowering)+5t FYM, N_3- 15×10 cm with 125% RDF(10% N at flowering)+5t FYM, N_4- 20×10 cm with 150% RDF(K in two splits + 10% N at flowering)+5t FYM/ha, N_5- 15×10 cm with 150% RDF(K in two splits +10% N at flowering)+5t FYM/ha, N_6- 20×10 cm with 150% RDF(K in two splits + 10% N at flowering)+10t FYM/ha and N_7- 15×10 cm with 150% RDF(K in two splits + 10% N at flowering)+10t FYM/ha. In experiment second the main plot consisted two treatment of varieties *viz.* Jeerafool (V_1) and Pusa Basmati (C_2). While the sub- plot consisted of seven treatments of nutrient management *viz.* N_1- 20×10 cm with RDF(60:50:50 NPK kg/ha), N_2- 20×15 cm RDF+5t FYM, N_3- 20×15 cm with RDF + 5t FYM + 5 t GM, N_4- 20×15 cm with 75% RDF+10t FYM/ha, N_5- 20×15 cm with 50% RDF+10t FYM/ha+ 10 t GM + mechanical weeding, N_6- 20×15 cm with 50% RDF+10t FYM/ha+ 10 t GM + mechanical weeding + silicon spray + ZnSo4 and N_7- 20×15 cm with 150% N + 10 t FYM +Staking. The both experiment was laid out in split plot design with three replication. In experiment first the rice variety Bamleshwari recorded significantly higher grain (7.93t/ha) and biological yield (16.82 t/ha) over Chandrahasni (6.97t/ha) and (14.74t/ha) which was 13.7 and 14.1% higher. In case of nutrient management practices the higher grain and biological yield was obtained with closer spacing and 150% RDF +10 t FYM (7.83 and 16.67 t/ha) followed by same geometry and dose of NPK + 5t FYM/ha (7.70 and 16.55 t/ha) the yields with these two treatments were at par, however wider spacing (20×10cm) 150% RDF+10t FYM gave marginally lower grain 2.2 and total yield 1.4% over closer spacing 15×10 cm. 150% RDF + 5t FYM/ha may be on account of higher plant population (33% higher hills/m^2) per unit area and the difference of only organic manure FYM 5t/ha. In experiment second the Local scented fine rice variety Jeerafool had significantly tallest plants while Pusa Basmati-1 had the shortest plants, number of total tillers, effective tillers (panicle/m2) and 1000-grain weight were significantly higher under Pusa Basmati -1 but panicle length number of grains/ panicle and panicle weight were significantly higher under jeerafool over Pusa Basmati -1. The data grain yield showed significant differences in the both rice cultivars. Jeerafool produced 11.4 % higher grain yield over Pusa Basmati-1. Application of 50% NPK of RDF with 10 t FYM + 10 t GLM+, mechanical weeding + silicon 3% spray+ 20 kg/ha ZnSo4 produced grain and biological yield of 4.3

and 9.16 t/ha, respectively while both the yields were almost equal in application of 150% N only with 10t FYM + staking and the yield were also at par with the treatment i.e, 50% NPK + 10t FYM + 10t GLM + mechanical weeding.

Keywords: Yield maximization, Rice, Fertilizer, Production

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PLANT GROWTH PROMOTING RHIZOBACTERIA IMPROVES GROWTH IN *ALOE VERA*

Meena[1], Nayantara[2]* and Baljeet Singh Saharan[1]

[1]*Microbial Resource Technology Laboratory, Department of Microbiology Kurukshetra University, Kurukshetra*
[2]*Department of Bio and Nanotechnology, Guru Jambeshwar University of Science and Technology, Hisar, Haryana*
Email: nayansheoran29@gmail.com

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Abstract*:* Sustainableagriculture involves the use of biofertilizers and biopesticides to reduce the application of chemical fertilizers. Microbial consortium-based sustainable and economicbionutrient package for *Aloe vera* has been developed to reduce reliance on chemical fertilizers. Consortium includes *Acinetobacter radioresistens* SMA4, *Bacillusthuringiensis* SMA5, *Brevibacteriumfrigoritolerans* SMA23 and *Pseudomonas fulva* SMA24. In the earlier studies all these four bacterial strains have been found to possess multiple plant growth promoting attributes. Consortium used in this study increased all biometric parameters in *Aloe vera*such as plant biomass, root weight, shoot weight and gel content. Increase in aloinA content was also observed in this study in plants treated with PGPR.

Keywords: *Aloe vera,* Consortium, PGPR, Aloin, Biofertilizer

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INFLUENCE OF THERMAL ENVIRONMENT ON PHENOLOGY, GROWTH, YIELD AND DEVELOPMENT OF MUSTARD (*BRASSICA JUNCEA* L.) VARIETIES

R.K. Kashyap[1], S.K. Chandrawanshi[3]*, Pandhurang Bobade[2], S.R. Patel[1], J.L. Chourdhary[1] and Deepak K. Kaushik[1]

[1] *Department of Agrometeorology, College of Agriculture, Indira Gandhi Krishi Vishwavidhyalaya Raipur (C. G.)*
[2] *RMD College of Agriculture & Research Station, Ambikapur (IGKV) (C.G.)*
[3]*Agricultural Meteorological Cell, Department of Agricultural Engineering, N.M College of Agriculture, Navsari Agricultural University, Navsari (GJ)*
Email: sandeepagromert@gmail.com

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Abstract: Among various important growth characters of these Mustard varieties, plant height was greatly influenced under different thermal environments. Maximum plant height was observed in variety Varuna E1 (29th November) and minimum height was recorded in E3 (19th December). First date of sowing had more duration from sowing to maturity as compared to delayed sowing. This shortening of duration was due to thermal stress at later sowing dates. From phenological development point of view, the thermal insensitivity of all the varieties was assessed based on the TSI and it was found that Vardan, Kranti and Varuna Mustard varieties were tolerant to thermal stress. Different Mustard varieties show non significant results under different thermal environments but the seed yield (kg/ha) showed significant results under different thermal regimes.

Keywords: Thermal environment, Phenology, Development, *Brassica juncea*

STUDIES ON THE FORAGING ACTIVITY OF INDIAN HONEY BEE, *APIS CERANA INDICA* FABR. AND OTHER HONEY BEE SPP. ON BUCKWHEAT FLOWERS

Jogindar Singh Manhare*, G.P. Painkra, K.L. Painkra and P.K. Bhagat

Department of Entomology
IGKV, RajMohini Devi College of Agriculture and Research Station, Ambikapur, Surguja 497001 Chhattisgarh, India
Email: manharejogindar@gmail.com

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Abstract: The foraging activity of Indian honey bee, *Apis cerana indica* Fabr. and other honey bee spp. on buckwheat flowers was undertaken at Research cum Instructional Farm of RMD CARS, Ajirma, Ambikapur (C.G.) of Indira Gandhi Krishi Vishwavidyalaya Raipur during year 2016-2017. The activity of *Apis cerana indica* was found higher in third week of December 2016 (69.71 bees/5min/m^2). Its maximum visitation was found at 1200 hrs (98.62 bees/5min/m^2). The maximum foraging activity of *Apis dorsata* was found at 1200 hrs (61.12 bees/5min/m^2). Whereas, the lowest was observed at 1700hrs (1.25 bees/5 min/m^2) in *Apis cerana indica* and *Apis dorsata* the lowest was observed at 1700hrs (0.75 bees/5 min/m^2). The foraging activity of *Apis florea* was noticed at 1400hrs (3.25 bees/5min/m^2) and was found least at 0800hrs (0.57 bees/5min/m^2).

Keywords: Foraging behavior, *Apis cerana indica, Apis dorsata, Apis florea*, Buckwheat

THERMAL REQUIREMENT OF MUSTARD IN LATE SOWN CONDITION AFTER RICE CROP AT RAIPUR UNDER CHHATTISGARH PLAIN

R.K. Kashyap[1], Pandhurang Bobade[2], S.K. Chandrawanshi[3]*, Deepak K. Kaushik[1] and R. Singh[1]

[1] Department of Agrometeorology, College of Agriculture, Indira Gandhi Krishi Vishwadhyalaya Raipur (C.G.)
[2] RMD College of Agriculture & Research Station, Ambikapur (C.G.)
[3]Agricultural Meteorological Cell, Department of Agriculutral Engineering, N.M College of Agriculture, Navsari Agricultural University, Navsari (GJ)
Email: sandeepagromert@gmail.com

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Abstract: The investigation of thermal requirement of mustard in late sown condition, after rice crop at Raipur under Chhattisgarh plain. It was found that cumulative GDD for emergence increased by different varieties under E1 as compared to E3. The PTU values were higher in 19th December sown crop as compared to 29th November and 9th December sowing. Lower PTU values were observed under 9th December sowing (E2) in Kranti while, the PTU values were in increasing trend for Vardan and varuna from29th November and 19th December. Different Mustard varieties show non significant results under different thermal environments but the seed yield (kg/ha) showed significant results under different thermal regimes. Highest seed yield was recorded in E1 (29th November) as compared to delayed sowings. Vardan was found out yielder in all temperature regimes as compared to other varieties. The radiation use efficiency was more in E1 sowing under S1 spacing. In early date of sowing (E1) both in case of S1and S2 the radiation use efficiency increase from 25 days to 75 days and then decreases up to at harvest. RUE is maximum in case of Varuna (3.06gMj^{-1}) under S1 spacing followed by Kranti (2.96gMj^{-1}) and lowest was recorded in variety Vardan (2.83gMj^{-1}) under S1 spacing. Heat use efficiency was observed that variety Kranti showed higher HUE for the entire thermal environment (different date of sowing) as compared to Varuna and Vardan It may be attributed to higher biomass.

Keywords: GDD, PTU, HTU, Heat use efficiency (HUE), Radiation use efficiency

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GENE PYRAMIDING OF FOUR BLB RESISTANT GENES *(XA4, XA7, XA13* AND *XA21)* FROM IRBB65 INTO MAHAMAYA USING MAS.

Mekala Mallikarjun* and Anil S. Kotasthane

Department of Plant Pathology, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya (IGKV), Raipur – 492012, Chhattisgarh, India
Email: mallikarjunmekala1991@gmail.com

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Abstract: Bacterial blight (BB) of rice (*Oryza sativa*) caused by *Xanthomonas oryzae pv. oryzae* (Xoo) is currently one of the most important diseases limiting rice production and it has become widespread in India. This disease was first noticed by the farmers of Japan in 1884 (Tagami and Mizukami 1962). Enhancing genetic resistance has proven to be the most effective control method for controlling the disease. Four bacterial blight (BB) resistance genes, *Xa4, Xa7, xa13 and Xa21*, were introgressed into an elite rice cultivar. Marker assisted selection was done using linked molecular markers for genes *Xa4, Xa7, xa13 and Xa21*. The ability to quickly and reliably select desirable material and to eliminate individuals that contain deleterious alleles is critical to the success of the plant breeding program (Dubcovsky 2004). We report here in two gene pyramids *Xa7+ Xa21* in 5 lines and *Xa4+Xa7* in 1 line. Genes in combinations were found to provide high levels of resistance. Besides pyramids a set of 8 genotypes with only *Xa7*, 2 genotypes with only *Xa13* and 5 genotypes for *Xa21* were also found in this study. High resolution maps generated *in-silico* around *Xa4, Xa7, xa13 and Xa21* can be useful for the precise placement of a gene of interest,analysis of regional and sub regional rates of recombination and appropriate combinations of markers for marker assisted selection.

Keywords: Gene Pyramiding, Bacterial blight, Resistance genes, Polymerase chain reaction, Marker Assisted Selection *Xanthomonas oryzae* pv. *oryzae*, MAS, Pyramiding

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FIELD SCREENING OF DIFFERENT VARIETIES OF TOMATO AGAINST FRUIT BORER, *HELICOVERPA ARMIGERA* (HUBNER)

Laxman Singh, P.K. Bhagat, G.P. Painkra* and K.L. Painkra

Department of Entomology, IGKV, Raj Mohini Devi College of Agriculture and Research Station, Ambikapur, Surguja 497001 (Chhattisgarh) India
Email: laxman.singh.lucky1991@gmail.com

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Abstract: A field experiment was undertaken at research farm of Raj Mohini Devi College of Agriculture and Research Station Ambikapur, Surguja of Indira Gandhi Krishi Vishwavidyalaya Raipur (Chhattisgarh) during 2016-17 on twelve tomato varieties on fruit borer, *Helicoverpa armigera* (Hub.). Tomato varieties *viz.* JK Ratan, JK. 25, JK Nandni, prabhav, Nirmal 2530, N.S. 962, NS 592, Siddharth, Amrita, Bhagya, Kapila and Pusa-Ruby were tested for resistance against *Helicoverpa armigera* infestation under field conditions. The varieties JK 25 and Prabhav had minimum fruit weight loss (1.57% and 3.26%) as well as minimum number of infested fruits (1.85% and 3.79%) respectively by the *Helicoverpa armigera*. These variety also had minimum *Halicoverpa armigera* larval population, i.e. 0.14, and 0.22 larvae/plant, respectively. The variety Pusa-Ruby and Amrita had maximum loss in fruit weight (30.41% and 21.67%) as well as maximum number of infested fruit (30.85% and 23.28%) with larval population of 1.05 and 0.68 larvae/plant. Pusa-Ruby was categorized as susceptible genotypes with fruit infestation (30.85%) and larval population per plant (1.05%). Variety Bhagya, JK Ratan, Siddharth, NS 592, and Amrita (20.21%, 20.51%, 21.10%, 21.44% and23.28%) was categorized as moderately susceptible. Variety JK Nandini, Kapila, NS 962 Nirmal 2530 (14.70%, 15.62%, 15.81%, and 19.51%,) was categorized as moderately resistant. Variety JK 25 and Prabhav (1.85% and 3.79%) and declared as resistant variety to tomato fruit borer.

Keywords: Screening, Tomato varieties, Fruit borer, Vegitable

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IMPACT OF SYSTEM OF RICE INTENSIFICATION (SRI) THROUGH FRONT LINE DEMONSTRATIONS

B.K.Tiwari*, K.S. Baghel, Akhilesh Kumar Patel, Akhilesh Kumar, Sanjay Singh and A.K. Pandey

JNKVV, Krishi Vigyan Kendra, Rewa, Madhya Pradesh-486001

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Abstract: Front line demonstrations were conducted at farmer's field in Umaria district during *kharif* seasons of 2009-10 to 2013-14 (five years) at seven different locations under real farming situations prevailing farmer's practices were treated as control for the comparison with recommended SRI practice. Result of front line demonstration showed a greater impact on farmer's economy due to significant increase in crop yield more than two fold over FP. Economics and benefit cost ratio of both FP and RP plots were worked out of RS. 36942/ha was recorded net profit under RP while it was Rs. 16734/ha under FP. Benefit cost ratio was 2.64 under RP, while 1.88 under FP. Demonstrating improved transplanting technique of rice open new horizon of income of farming community of Umaria district as it is profitable in both sense i.e. input saving as well as yield enhancing.

Keywords: Front line demonstration, SRI, Rice, BC ratio, Farmer, Productivity

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STUDY ON THE SEASONAL INCIDENCE OF MUSTARD APHID (*LIPAPHIS ERYSIMI* KALT.) IN RELATION TO WEATHER PARAMETERS

N.C. Mandawi*, Y.K. Yadu[2], S.S. Rao[1] and V.K. Dubey[2]

[1]College of Agriculture and Research Station, Raigarh (C.G.)
[2]Department of Entomology, IGKV,Raipur (C.G.)
Email:.nemimandawi@gmail.com

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Abstract: The aphid incidence and its correlation with weather parameters were studied at college of Agriculture and Research Station, Raigarh, Chhattisgarh during the Rabi 2013-14 and 2014-15 crop seasons. Mustard variety "Pusa bold" was used as test crop. This study will provide an opportunity to fact the pest challenge by manipulating the manageable ecological parameters in the form of planting to harvesting time adjustment, varietal election, correct time of pesticide application, *etc*. The aphid appearance of mustard aphids were observed on January 2nd & 5th 2013-14 & 14-15 and disappeared after mid March. The peak period of aphid population was found at 5th to 9th SMW 114.41 to 318.01 aphid/plant during Rabi 2013-14 and 113.92 to 314.52 aphid /plant during 2014-15. The correlation coefficient (r) showed a non-significant negative effect with maximum and minimum temperature whereas relative humidity showed non-significant positive effect.

Keywords: Mustard, Aphid, *Lipaphis erysimi*, Population, Humidity, Temperature

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EFFECT OF TILLAGE PRACTICES AND INTEGRATED NUTRIENT MANAGEMENT ON GROWTH, ANALYSIS PARAMETERS OF SORGHUM (*SORGHUM BICOLOR* L.)

Samrat Dhingra* and N.S. Thakur

Department of Agronomy, RVS Krishi Vishwavidhyalaya,
College of Agriculture, Indore (M.P.)
Email: molusamdy@rediffmail.com

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Abstract: An experiment was conducted during kharif 2009 & 2010 at the Rajmata Vijyaraje Scindia Krishi Vishwa Vidyalaya College of Agriculture, Indore (M.P.) to study on the effect of tillage practiced and integrated nutrient management on growth, analysis parameters of sorghum. Tillage practices influenced only leaf area significant; chlorophyll content and leaf area index remained unchanged at all the growth stages. Reduced tillage encouraged all these parameters are others. Amongst INM treatments, 100% RDF (N_{80} $P_{40}K_{40}$) recorded above parameters up to maximum. Crop growth rate, relative growth rate and net assimilation rate remained unchanged due to tillage practices and INM treatments, reduced tillage recorded maximum Dry matter, grain and stover yields. In case of integrated nutrient management, 100% Recommended dose of fertilizer (80:40:40) and 75% Recommended dose of fertilizer (60:30:30) +5t FYM/ ha recorded equally higher grain and stover yields, being significantly superior to other fertility levels.

Keywords: Tillage practices, Integrated nutrient management, Growth analysis parameters, Sorghum

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EFFECT OF DATE OF SOWING AND WEED MANAGEMENT TECHNIQUES ON GROWTH ATTRIBUTES AND YIELD OF BLACKGRAM (*VIGNA MUNGO* L.)

Nishant Kumar Sai*, R. Tigga and V.K. Singh

IGKV, RMD College of Agriculture and Research station, Ambikapur-497001 (C.G.)India

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Abstract: An experiment was carried out to evaluate the effect of date and weed management techniques on growth and yield of blackgrama (*Vigna mungo* L.). Maximum seed yield was recorded when sowing was done on 15th July and weed management practices mechanical weeding (15 and 30 DAS and removal of weeds within rows by hand) followed by sowing on July 25th and weed management practices pendimethalin @ 0.75 a.i.ha^{-1} and mechanical weeding at 30 DAS. It was due to higher plant height, higher number of branch plant^{-1}, dry matter production.

Keywords: Blackgram, Weed management practices, Growth attributes