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Contents

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INVENTORYING AND MONITORING OF AQUATIC PLANT DIVERSITY OF FLUVIAL ECOSYSTEM OF RAJAJI NATIONAL PARK, UTTARAKHAND, INDIA

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Received-10.02.2015, Revised-21.02.2015

Abstract : Aquatic plant diversity and the physico-chemical characteristics of the aquatic habitat of Song and Suswa river flowing in the Rajaji National Park, Uttarankhand, has been monitored seasonally. Four sampling sites S_1, S_2, S_3 and S_4 were identified. S_1 and S_2, at Song river S_3 and S_4 at Suswa river of Rajaji National Park. Seasonal sampling was done and the study revealed that diversity has been found to be high in winter months comparatively due to low turbidity, high water transparency, high dissolved oxygen and low water velocity

Keywords: Inventoring, Monitoring, Physico-chemical parameters, Aquatic, Habitats, Rajaji National Park

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NEW RECORD OF MISTLETOE AS A POTENTIAL EXOTIC WEED: SERIOUS THREAT TO SAPOTA CULTIVATION IN CHHATTISGARH

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Abstract : *Dendrophthoe falcata* (L.f) Ettingsh commonly called "Banda" is a serious and very common angiospermic parasitic plant in Chhattisgarh it is being reported for the first time from sapota, *Achras sapota*. Our findings report that it was observed with an average plant population of 2.18 plants/trees and more number of the parasitic plant were observed on North and West direction, 2.60 and 2.40, respectively. *D. falcata* is the serious serious threat to sapota cultivation in Chhattisgarh. Insect pest associated with *D. falcate* were also recoded viz., *Celypha woodiana* (Barrett), *Pseudaulacaspis*

cockerelli (Cooley), *Aleurodicus disperses* (Russell), *Delias hyparete metarete* (Linnaeus), *Euthalia adonia pinwilli, Papilio cresphontes, Frankliniella sp.*, Unidentified Chrysomelid along with natural enemies viz., *Oecophylla smaragdina* (Fabricius) *Cotesia flevipes*, *Oxyopes macilentus* (Linnaeus).

Keywords : Exotic weed, Cultivation, New record, Chhattisgarh

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CONSTRAINTS AND STRATEGIES IN ADOPTION OF BEEKEEPING BY BEEKEEPING ENTREPRENEURS

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Abstract : The study was conducted in Six block of Samastipur district in Bihar out of twenty block six block selected namely Pusa, Kalyanpur, Ujiarpur, Warisnagar, Marwa and sarairanjan. A sample of 90 trained beekeeping entrepreneurs were selected from six experimental village and 90 untrained beekeeping entrepreneurs were from other six control villages in order to avoid interactional and diffusion effect. Thus a total sample of 180 rural entrepreneurs was selected as respondents. Constraints faced by beekeeping entrepreneurs in setting up beekeeping enterprise were grouped in four categories viz. socio - personal, economic, technological and communicational constraints. Low level of consumer awareness and motivation, poor access to finance, irregular and ineffective training programme for upgrading the know-how and skill and inadequate access to training programme were the major constraints for beekeeping entrepreneurship development. The following strategies are suggested not only to remove the bottlenecks rationed above but also to strengthen the adoption of beekeeping enterprise by entrepreneurs were creation of proper consumer awareness for enhancing motivation provision of institutional finance on reasonable interest improving access and effectiveness of training programme in beekeeping enterprise.

Keywords : Constraints analysis, Strategies, Beekeeping entrepreneurs, Effectiveness of training programme

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STUDY ON COMPARATIVE PERFORMANCE OF FINE SLENDER RICE GENOTYPES AGAINST RICE GALL MIDGE IN THE NORTHERN HILL REGION OF C.G.

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Abstracts : A part from food, rice is intimately involved in the culture as well as economy of many societies. The cultivation of rice is done under more diverse conditions than any other food crop, ranging from irrigated to rainfed ecology and upland to deep water conditions. In world, rice has occupied an area of 154 million hectares, with a total production of 476 million tonnes and productivity 2949 kg ha^{-1} (Anonymous, 2012). India has largest area among rice growing countries and enjoys the second rank in production. India has 45.5 million hectares, total cultivated area under rice, with the production of 105.31 million tonnes and productivity 2393 kg ha^{-1} (Anonymous, 2013 a). Chhattisgarh state is popularly known as “rice bowl of India” because maximum area is covered under rice during *Kharif* and contribute major share in national rice production. It has geographical area of 13.51 million hectares of which 5.9 million hectares area is under cultivation. Rice occupies an area around 3.61 million hectares, with the production of 5.48 million tonnes and productivity 1517 kg ha^{-1} (Anonymous, 2013b).

Keywords : Hill region, Genotypes, Rice

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INCIDENCE OF WHITE BACKED PLANT HOPPER, *SOGATELLA FURCIFERA* (HORVATH), ZIGZAG LEAF HOPPER, *RECILIA DORSALIS* AND WHITE LEAF HOPPER, *COFANA* SPP. UNDER UPLAND RICE ECOSYSTEM AND THEIR CORRELATION WITH WEATHER PARAMETERS

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Abstract: Rice occupies the prominent place in Indian agriculture. Field experiment was conducted at research farm of Indira Gandhi Krishi Vishwa Vidyalaya, Raipur during *kharif* season 2013-14 using two upland direct seeded rice ecosystems (UDS) and upland transplanted rice ecosystems (UTP). The results of field experiments revealed that the maximum incidence of white backed plant hopper, *Sogatella furcifera* and zigzag leaf hopper, *Recilia dorsalis* observed in UTP with (1.38) and (1.46) as compare to UDS with (0.20) and (0.32) nymph/adult/25 sweeps (seasonal mean), respectively. White backed plant hopper showed significant positive correlation with sun shine hours in UDS only. Zigzag leaf hopper showed significant positive correlation with sun shine hours and significant negative correlation with minimum temperature, average temperature, evening relative humidity, average relative humidity in UTP. The maximum population of white leaf hopper, *Cofana* spp. was observed in UDS as compare to UTP and showed non-significant correlation with weather parameters.

Keywords: Ecosystem, Leaf hopper, Plant hopper, Rice, Upland

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EVALUATION OF EFFICACY OF SOME NOVEL CHEMICAL INSECTICIDES AGAINST STEM BORER, *CHILO PARTELLUS* (SWINHOE) IN MAIZE

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Abstract: For present studies entitled "Evaluation of efficacy of some novel chemical insecticides against stem borer, *Chilo partellus* (Swinhoe) in maize", were conducted in randomized block design with three replications of seven treatments during *Kharif,* 2011 at crop research centre of Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (U.P.). Among all the treatments the seed treatment with chlorantraniliprole 18.5 SC @4ml/kg seed and one spray @ 350ml/ha was performed best with minimum infestation (4.5 per cent at 25 DAS and 7.42 per cent at 40 DAS), minimum number of dead hearts (2.33 per cent at 25 DAS and 1.66 per cent at 40 DAS) and minimum tunnel length (1.94 cm). The second best treatment was found fipronil 5SC @ 4ml/kg seed and 625ml/ha with infestation (7.84 and 10.27 per cent at 25 and 40 DAS), dead hearts (2.66 per cent at 25 DAS and 2.33 per cent at 40 DAS) and tunnel length (2.41 cm). The maximum infestation (30.45 per cent at 25 DAS and 31.30 per cent at 40 DAS), maximum number of dead hearts (7.33 per cent 25 DAS and 6.33 per cent at 40 DAS) and maximum tunnel length (11.07 cm) per plant was recorded with untreated control during the study. The maximum grain yield of 73.33 q/ha and net profit of Rs. 32714/ha obtained from the treatment of chlorantraniliprole and followed by fipronil. The minimum grain yield of 37.78 q/ha was recorded in untreated control.

Keywords: Stem borer, Novel insecticides, Maize

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SOIL QUALITY ASSESSMENT OF MILAK TAHSIL, DISTRICT RAMPUR (UTTAR PRADESH) UNDER RICE -MENTHA+WHEAT FARMING SYSTEM

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Abstract : Macro and micro nutrients are important soil elements that control its fertility. Soil fertility is one of the important factors controlling yields of the crops. Soil characterization in relation to evaluation of fertility status of soil of an area or region is an important aspect in context of sustainable agriculture production. Because of imbalanced and inadequate fertilizer use coupled with low efficiency of other inputs, the response efficiency of chemical fertilizer nutrients has declined tremendously under intensive agriculture in recent year. In the present investigation, an attempt has been made to examine the chemical properties of soil in rice – menthe+wheat farming system.The study area covers Milak Tehsil of Rampur district of Uttar Pradesh. Soil samples of 0-15 cm depth were collected from 326 sites covering 21 gram panchayats. Collected soil samples were air dried in shade, crushed gently with a wooden roller and pass through 2.0 mm sieve to obtain a uniform representative sample. The processed soil samples were analyzed by standard methods.The pH varied from 5.2 to 9.2, organic carbon content varied from 3.9 to 6.9 g Kg^{-1} soil. The available N content was varied from 156.96 to 259.32 kg ha^{-1} with an average value of 224.32 kg ha^{-1} The available phosphorous content varied from 21.79 to 56.53 P_2 O_5 kg ha^{-1} with a mean value of 37.18 P_2O_5 kg ha^{-1}.Status of available potassium in the ranged from 158.20 to 283.25 K_2O Kg ha^{-1} with an average value of 211.92 K_2O kg ha^{-1}. Cu in the surface soil was found to sufficient and varied from 0.258 to 1.708 mg kg^{-1} The iron content varied from 3.214 to 16.852, Mn from 1.701 to 8.351 mg kg^{-1}. The available Zn in surface (0-15 cm) in soil ranged from 0.425 to 1.708 mg kg^{-1} soil in rice-mentha+wheat. Nutrient status regarding to the available macro and micro nutrient in surface soil indicate that soils are low in available N and medium in available P and K and in general marginal in available Cu,Fe, Mn and Zn. Normal to slightly alkaline in reaction, low to medium in organic carbon content.

Keywords: Soil fertility, Macro & micro nutrients, Rampur, Farming system

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VARIABILITY AND GENETIC PARAMETERS FOR GRAIN YIELD IN CMS BASED RICE HYBRID (*ORYZA SATIVA* L.)

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Abstract : The present investigation was carried out during *kharif* 2012 and 2013 at Raipur to study the genetic parameters for quantitative and quality characters in eighty three genotypes in rice (*Oryza sativa* L.). Analysis of variance revealed significant differences for almost all the traits under study. The characters, viz. sterile spikelets $panicle^{-1}$, fertile spikelet $panicle^{-1}$, pollen fertility percent, grain yield $plant^{-1}$, spikelet fertility percent, harvest index and biological yield $plant^{-1}$ exhibited high genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV). Small differences between GCV and PCV were recorded for all the characters studied which indicated less influence of environment on these characters. sterile spikelet $panicle^{-1}$, fertile spikelet $panicle^{-1}$, pollen fertility percent, grain yield $plant^{-1}$, spikelet fertility percentage, harvest index, biological yield plant, number of spikelet $panicle^{-1}$, 1000 grain weight and productive tillers plant exhibited high heritability coupled with high genetic advance as per cent of mean indicating that simple selection could be effective for improving these characters.

Keywords : Genetic advance, GCV, Heritability, Hybrid rice, PCV

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EFFICACY OF CERTAIN FUNGICIDES AND BIOAGENTS AGAINST ANGULAR LEAF SPOT OF COTTON (*GOSSYPIUM HIRSUTUM* L.) UNDER FIELD CONDITIONS

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Abstract : An experiment was conducted during *kharif* season of 2011-12 central research plot of SHIATS. To find out the efficacy of certain fungicides and bio-agents against *Xanthomonas campestris pv malvaciarum* of cotton different treatment of Bordeax mixture, Neem cake, *Pseudomonas fluorescens*, Streptomycin, *Bacillus subtilis*, Mancozeb, Carbendazim was used as foliar spray. Result that the foliar spray of Streptomycin @ 0.025% was found most effective in reducing the disease severity (17.03%) at 120 DAS, (18.67%) 150 DAS, (20.59%) at 180 DAS and increased yield (29.10 q/ha) at harvest.

Keyword : *Xanthomonas campestris pv. malvaciarum*, Fungicides, Bio-agents

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GROWTH AND ENERGETICS OF RICE AS INFLUENCED BY PLANTING GEOMETRIES AND SEEDLING DENSITIES UNDER SRI BASED CULTIVATION PRACTICES

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Abstracts : All over the world, the importance of agriculture, especially rice production, is increasing. To cope with the rising population, rice production needs to increase following vertical, instead of horizontal, expansion. Varieties have a great effect on the growth performance and yield contributing characters. India is second largest producer after china and has an area of over 42.2 million hectares and production of 104.32 million tonnes with productivity of 2372 kg ha^{-1}(Anonymous, 2012). The productivity of rice in Chhattisgarh is 1.80 t ha^{-1} and its area is 3.65 million ha (Anonymous, 2013). Country has also emerged as a major rice consumer. Rice is consumed both in urban and rural areas and its consumption is growing due to high-income elasticity of demand. To meet the growing demand, a rapid increase in paddy production is needed. But, there is little scope to increase the area; hence increase in production and productivity with an improvement in efficiency of production act as a technological breakthrough to meet the growing demand. New approaches in international trade for aromatic rice's have to be developed. The national governments are required to design policies for grain qualities of aromatic rice's for both domestic and international trade.

Keywords : Growth, Cultivation, Rice

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PHYTOPLANKTON ASSEMBLAGE IN THE SOLAR SALTPANS OF KANYAKUMARI DISTRICT, TAMIL NADU

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Abstract : The quantity and quality of salt production in a solar salt work is determined by the bydrobiological activity (Davis, 1974). Here we report on phytoplankton identified in different saltpans (Kovalam, Thamaraikulam and Puthalam) of Kanyakumari District, India. Totally 45 taxa of phytoplankton were identified in four divisions such as *Bacillariaphyta*, *Chlorophyta*, *Cyanophyt*a and *Dinophyta*. Kovalam saltpan shows high marine cyanobacterial biodiversity than the other two saltpans.

Keywords: Phytoplakton, Saltpan, Cyanobacteria

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AWARENESS OF FARMERS ABOUT CLIMATE CHANGE IN PLAIN ZONE OF CHHATTISGARH

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Abstract : In order to combat from adverse effect of climate change and any coping or adaptation strategies, first of all the communities facing climate change should perceive that the changes are indeed taking place. In other words we can say that awareness of farmers regarding changes or variability in climatic condition is important to know its impact on agriculture. To know the level of awareness of farmers regarding climate change, present study was conducted with 240 selected farmers of Plain Zone of Chhattisgarh during the year 2013-14. Most of the farming communities cannot classify the term climate change but are well capable of describing changes in weather. It can be observe from Table 1 that majority of the farmers (70.00%) were fully aware about rise in the risk of crop failure due to climate change has increased, whereas, 65, 54.58 and 52.50 per cent of the farmers were fully aware about pollution is increasing in the atmosphere, climate is getting warmer and weather has become unpredictable, respectively. With regards to overall awareness of about phenomena due to climate change, about 55 per cent of the farmers were moderately aware, whereas, 32.08 and 9.58 per cent farmers belonged to highly aware and somewhat awareness category. Awareness and understanding of farmers on climate change is pre requisite to take appropriate initiatives to combat climate change. The only solution for these huge populations seems to be adequate and relevant adaptation strategies. It has been reported that there is a large deficit of information and knowledge in this vulnerable region which impedes decision making and assessment of climate related risks, and adaptation.

Keywords : Farmers, Climate, Crop

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GENETIC ANALYSIS OF YIELD AND ITS CONTRIBUTING TRAITS IN BRINJAL (*SOLANUM MELONGENA* L.)

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Abstract: The estimated value of additive genetic component $(\hat{D})$ was significant for all characters- days to flowering, height of plant, number of branches per plant, length of leaf, width of leaf, length of fruit, width of fruit, number of fruit per plant, width of fruit, number of fruit per plant, weight of fruit and fruit yield per plant. The value of $(\hat{H}_1)$ was observed higher than the $(\hat{H}_2)$ and additive genetic component $(\hat{D})$ for all the traits. The estimates of dominant component $(\hat{H}_2)$ was also higher than additive genetic component $(\hat{D})$ for all the traits except width of fruit. The estimated value of $(\hat{h}^2)$ was found positive and significant all the characters except four characters plant height, number of branches per plant, length of fruit and fruit yield per plant. The estimated value of $(\hat{F})$ was found to be positive and significant for all the characters except for days to flowering number of branch per plant, length of leaf, length of fruit, and width of fruit. The estimated value of $(\hat{E})$ was found to be non significant for all the characters except of dominance $(\hat{H}_1/\hat{D})^{0.5}$ reflected over dominance for all the

characters. The computed ratio of $\hat{h}_2/\hat{H}_2$ being less than unity for all characters except days to flowering, length of leaf, width of leaf, width of fruit.

Keywords : Brinjal, Yield, Genetic analysis

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YIELD ATTRIBUTING CHARACTERS AND YIELD OF SAFFLOWER UNDER RICE BASED CROPPING SYSTEM

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Abstract : A field experiment was conducted during 2013 at Indira Gandhi Krishi Vishwavidyalaya, Raipur under *Alfisol* soil. Three tillage practices, zero tillage (T_1), minimum tillage (T_2) and conventional tillage (T_3) in main plot along with six irrigation and mulching treatments, no irrigation (I_1), no irrigation + mulch (I_2), irrigation at critical growth stage (branching + flowering) (I_3), irrigation at critical growth stage (branching + flowering) + mulch (I_4), two irrigation at 30 days interval (I_5) and two irrigation at 30 days interval + mulch (I_6) in sub-plot were used. Maximum yield attributing characters and yield was obtained under conventional tillage (T_3) as compared to minimum tillage (T_2) and zero tillage (T_1). The irrigation at critical growth stage (branching + flowering) + mulch (I_4) treatment was found to be the best with 1670 kg ha^{-1} and 1756 kg ha^{-1} seed yield and stover yield followed by irrigation at critical growth stage (branching and flowering) (I_3) and two irrigation at 30 days interval + mulch (rice straw) (I_6). The mulching treatments gave higher yields as compared to non-mulch treatments.

Keywords: Economics, Productivity, Yield, Safflower

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EFFECT OF CROP GEOMETRY AND WEED MANAGEMENT PRACTICES ON GROWTH AND PRODUCTIVITY OF SOYBEAN

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Abstract : A field experiment was conducted during Kharif season at 2007 at Research-cum-Instructional Farm, Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh), India, .to study the Effect of crop geometry and herbicides on growth and productivity in soybean(Glycine max L. Merrill). The experiment was laid out in Split plot Design (SPD) with two treatments main plot six treatments sub plots and three replication. At harvest, not significant affect by plant spacing but significantly higher seed yield obtained with treatment Fluchoralin@ 100 g ha^{-1} (PE) + Hand weeding at 40 DAS (2354 kg ha^{-1}), however, it was found comparable with the yield of Hand weeding twice at 20 and 40 DAS (2316 kg ha^{-1}). Significantly lowest weed count and highest weed control efficiency also recorded with T6

Keywords : Crop, Effect, Growth, Productivity, Soybean

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EVALUATE THE EFFICACY OF SOME NOVEL CHEMICAL INSECTICIDES ON NATURAL ENEMIES IN MAIZE

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Abstract: For present studies entitled "To evaluate the effect of novel insecticides on natural enemies in Maize", were conducted in randomized block design with three replications of seven treatments for years *i.e.* "*kharif*, 2011 at crop research centre, chirori, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut (U.P.) 250110. The coccinellids population decreased markedly due to application of different insecticides. The effect of different treatments on coccinellids population was recorded at 15, 30, and 45 days after sowing the maize crop. The minimum population of coccinellids (2.4, 3.13 and 3.87) was recorded in chlorantraniliprole 18.5 sc@4ml/kg seed or 350ml/ha. The highest population (14.68, 10.81 and 11.67) was recorded in untreated control.

Keywords: Population, Chemical insecticides, Maize

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ASSESSMENT OF COPPING MECHANISM OF FARMERS TO MITIGATE DISASTER DUE TO CLIMATE CHANGE IN CHHATTISGARH PLAIN

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Abstract : Agriculture places heavy burden on the environment in the process of providing humanity with food and fiber, while climate is the primary determinant of agricultural productivity. Given the fundamental role of agriculture in human welfare, concern has been expressed by federal agencies and others regarding the potential effects of climate change on agricultural productivity. To examine how farmer's have been mitigating to disaster due to adverse effect of climate change. The present study was conducted in plain zone of Chhattisgarh state in the year 2013-14. For the purpose, 240 farmers of Chhattisgarh plain were interviewed. Based on the results of the interviews most of the farmers (about 90%) mentioned that they faced drought and erratic rainfall as disaster during previous 15 years. Majority of the affected farmers (about 50%) reported that their income and yield reduced due to flooding or heavy rainfall. In case of erratic rainfall, drought and frost same losses had reported by most of the affected farmers. About 61.57, 23.78, 14.42 and 8.04 per cent of affected farmers said that they had lost their livestock due to drought, environmental pollution, erratic rainfall and flood, respectively. As regards to copping mechanism practiced by farmers to mitigate losses from disaster, majority of the farmers borrowed loan to mitigate adverse effect of frost (79.14%), erratic rainfall (72.09%), drought (60.19%) and flood (38.19%).However, poor and marginalized groups were unaware regarding climate change impacts and adaptation measures. Thus, these measures were found to be event specific based on local knowledge and innovations, and not actually to cope with the impacts of climate change.

Keywords : Climate, Disaster, Farmers, Chhattisgarh

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EFFECT OF PLANTING GEOMETRY AND SEEDLING DENSITIES ON LIGHT INTERCEPTION IN RICE CULTIVATION

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Abstracts : The optimum number of seedling densities and spacing, more number of leaves exposed to sunlight which intercepted more light. The wider spacing resulted in profuse tillering and facilitated plant for better utilization of resources,

optimum planting geometries is good for growth and utilization of nutrients. It helps in better growth of plants. Higher plant height helps better LI which results in higher absorption of specific wave length of light necessary for photosynthesis that ultimately increased the yield.

Keywords : Effect, Seedling, Cultivation, Rice

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A COMPARATIVE ECONOMIC ANALYSIS OF KHARIF AND SUMMER PADDY IN RAJNANDGAON DISTRICT OF CHHATTISGARH STATE

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Abstracts: Paddy is the major staple food which can provide a Nations population with the nationally required food security minimum of 2,400 calories per person per day (FAO, 2000). It is the staple food for about 50 per cent of population in Asia, where 90 per cent of the words rice is grown and consumed.

Keywords: Economic analysis, Kharif, Rajnandagaon

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EFFECT OF PULSING WITH CHEMICALS ON POST-HARVEST QUALITY OF GLADIOLUS (*GLADIOLUS HYBRIDUS* HORT.) CV. PEATER PEARS

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Abstract : An experiment was conducted to find out the effect of pulsing solutions on postharvest life of gladiolus cv. Peater Pears cut spikes. Among all the pulsing treatments , treatment, T_4 (20% Sugar + 200ppm STS + 200 ppm GA3) gave maximum vase life, floret size, minimum days to open basal floret, maximum floret longevity, floret opening percentage while treatment T_7 (20% sucrose + 300 ppm Al_2SO_4 + 200 ppm GA_3) attained maximum number of floret, floret weight and floret open at a time during the study.

Keywords : Gladiolus, Pulsing, Spike, Vase life