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ISOLATION AND BIOCHEMICAL CHARACTERIZATION OF AN AMYLASE PRODUCING THERMOPHILIC BACTERIUM FROM GARDEN SOIL

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Abstract: A thermophilic bacterium (strain Th-3), which was able to degrade starch maximally, was isolated from the soil of Delhi University Botanical Garden. The temperature and pH optima and incubation time for the maximum growth of isolated bacterium were found to be 45°C, pH 6.0 and 24 h, respectively. In addition to amylase production, the bacterium had also shown positive results for production of protease, lipase and catalase as well as for nitrate reduction. Th-3 exhibited maximum amylolytic activity, when assayed at 45°C at pH 6.5 in the culture harvested at 24 hours of growth. The bacterium was non-pathogenic, as tested on Himedia sheep blood agar plates. The strain was sensitive to most of the antibiotics tested, except ampicillin and kanamycin to which it had shown resistance. The biochemical, microscopic and morphological features of the isolated strain indicated that it was Gram-positive, rod-shaped and closely resembled *Bacillus* species.

Keywords: Amylase, Amylolytic activity, Starch degrading enzyme, Thermophilic amylase, Thermophilic bacterium

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Keywords: Amylase, Amylolytic activity, Starch degrading enzyme, Thermophilic amylase, Thermophilic bacterium

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RESPONSE OF BIOCHEMICAL ACTIVITY OF *HELIANTHUS ANNUUS* L. CV.PAC – 36 TO SULPHUR DIOXIDE

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Abstract: Sulphur dioxide(SO₂) has been studied more extensively than any other pollutant as it is one of the most dominant primary air pollutants in the atmosphere. Some of the environmental effects of SO₂ include acidification of soils, lakes and rivers on one hand and injuries and devastating damage to vegetation under natural and controlled conditions on the other. Its acute and chronic exposure results in the general disruption of metabolic and fundamental cellular processes. The sensitivity of an oil-yielding cultivar of sunflower (*Helianthus annuus* L.cv.PAC-36) to SO₂ pollution had been observed using 2612, 3265, 3918 and 4571µg m⁻³ of SO₂ on 30,50,70 and 90d old plants. Analysis of plant samples collected showed that photosynthetic pigments (chlorophyll a, b and carotenoids) were degraded and leaf extract pH and ascorbic acid content declined in SO₂ treated plants. However, the higher concentration of SO₂ proved more toxic as against the lower concentrations.

Keywords: Ascorbic acid, chlorophyll, *Helianthus*, pollutant, sulphur dioxide

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CHARACTERIZATION OF THERMOPHILIC AMYLASE FROM AN OBLIGATE THERMOPHILE, *THERMOACTINOMYCES VULGARIS*

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Abstract: Amylase finds a wide range of applications in starch industries, i.e., baking, brewing, distillery. The wild-type (1227) and mutant strains (1261 and 1286) of *Thermoactinomyces vulgaris* were screened for the production of amylase using 1% soluble starch. The maximum production of amylase was observed after 12 h of incubation at 50°C in wild-type strain 1227 of *T. vulgaris*. The amylase was found to be thermophilic, exhibiting its optimal activity at 75°C and at pH 6.0 in this obligate thermophile; and it preferred soluble starch as its substrate. Among the metal ions tested, Mn²⁺ was most stimulatory, while Hg²⁺ was most inhibitory to the activity of amylase. Thus, *T. vulgaris* amylase is a thermophilic metalloenzyme, requiring Mn²⁺ for its high-temperature catalysis, which can be exploited for amylase-based industries of diverse interests.

Keywords: Amylase, Metalloenzyme, *Thermoactinomyces vulgaris*, Thermophilic amylase

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PHENOTYPIC STABILITY OF YIELD AND ITS COMPONENT TRAITS IN LENTIL (*LENS CULINARIS* MEDIK)

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Abstracts: Thirty genotypes of lentil were evaluated under four diverse environments for stability analysis for yield and its related traits. Pooled analysis of variance for all the eleven characters indicated significant differences among the genotypes and environments. The linear component was observed to be significant for all the characters suggesting that the prediction of performance of genotypes were possible across the environments. Genotype L-4676 and L-4594 were observed to be desirable and stable for seed yield as well as other characters like number of primary and secondary branches/plant, plant height, 100 seed weight and biological yield. Further, the genotype L-415 was having high yield, S_{2d}=0 and b>1 indicating that this genotype would perform better in favourable environmental conditions.

Keywords: Lentil, G × E interaction, Phenotypic stability, Seed yield

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IN VITRO SALT INDUCED STRESS RESPONSES IN *CAPSICUM ANNUUM* CV. PUSA JWALA

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Abstract: The research work was carried out to study the effect of salt stress on biochemical aspects of different type of explants of cultivar Pusa Jwala of *Capsicum annum*. Leaf, hypocotyls, cotyledonary leaf and stem explants were cultured

on MS medium containing 2,2,4-D and various concentrations of NaCl (50, 100, 150 and 200mM) Data on fresh and dry weights of callus tissue were recorded monthly. Different biochemical parameters such as moisture percentage, proline accumulation, ascorbate, protein and phenolics were tested in order to put forward the relative tolerance to salinity. Present finding suggest that, the response of *capsicum* calli to salt stress may be accomplished by increasing the capacity of antioxidative system and the synthesis of new protein which could be in turn contribute to select a salt resistant in *Capsicum*.
Keywords: *Capsicum*, Ascorbate, Proline, Protein, Phenolics

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RELATIVE DOMINANCE OF WEED FLORA IN WETLAND RICE ECOSYSTEM OF THIRUVANANTHAPURAM DISTRICT

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Abstract: The field survey on floral diversity and dominance was carried out to develop a database on the floral diversity and relative species dominance in wetland rice ecosystem of Thiruvananthapuram district during the first and second crop seasons, in both cultivated and fallow fields. The results revealed that in the cultivated fields during both seasons, the most prominent weed species among the three classes of weeds (grasses, sedges and broad leaved weeds) were *Isachne miliacea*, *Cyperus iria* and *Monochoria vaginalis* respectively. The relative dominance of the weeds in the fallows was found slightly different. While *Isachne miliacea* remained to be the dominant grass weed, the dominant sedge weed in the fallows was *Cyperus distans* during the first crop season while it was *Fimbristylis miliacea* during the second crop season. *Monochoria vaginalis* and *Ludwigia perennis* topped the list of broad leaved weeds in the rice fallows during first and second crop seasons respectively.

Keywords: Relative dominance, Weed flora, Wetland, Rice ecosystem, Rice fallow

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EFFECT OF OPTIMAL, SUB-OPTIMAL AND INTEGRATED NUTRIENT MANAGEMENT ON SOIL PROPERTIES AND NUTRIENT UPTAKE ON RICE (ORYZA SATIVA)

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Abstract: The present investigation entitled “Effect of optimal, sub optimal and integrated nutrient management on soil properties and nutrient uptake on rice (*Oryza sativa*)” was carried out at the Research Cum Instructional Farm IGKV., Raipur (C.G.) during *kharif* season of 2010. The soil of experimental field was „*Inceptisols*” locally known as *Matasi*. It was neutral in reaction, low in nitrogen, medium in available phosphorus and potassium. The experiment was laid out in randomized block design with 3 replications. The results revealed that amongst the different optimal, sub-optimal and integrated nutrient management practices using green manure, farmyard manure and chemical fertilizers, T₁₀ consisting of 50% RDF + 50% N through green manuring recorded the highest growth, energy output (178.38 MJ x 10³) and NPK content in soil. Application of 100% RDF (80:60:40 kg NPK ha⁻¹) also proved superior over other integrated nutrient management systems consisting farmyard manure and rice residues for energy output (176.75 MJ x 10³). Sub-optimal doses of nutrients failed to provide considerable yield advantage and build-up of nutrients in soil as compared to optimal level or integrated nutrient management options.

Keywords: Nutrient management, Nutrient uptake, Soil properties, Energy

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POST-FERTILIZATION OVULE ABORTION IN VIGNA RADIATA (L) WILCZEK

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Abstract: *Vigna radiata* (L.) Wilczek is a promising and widely used pulse crop in India. Unfortunately, the yield of this crop has been low. One of the reasons for this low yield has been the occurrence of as much as 50 per cent ovule abortion. The position of the abortive ovules varies from the first to the fourteenth position in the pod. To gain an insight into the cause(s) that lead to ovule abortion, developmental changes in ovules have been studied at light and ultramicroscopic level. Besides, behaviour of chromosomes in two sex mother cells i.e. embryo-sac mother cell and pollen mother cell has also been studied. Although the chromosomal studies in female sex mother cells did not reveal any abnormality in the behaviour of chromosomes thus ruling out its involvement in inducing abortion, the detailed ultrastructural studies revealed ovule abortion in *V. radiata* to be taking place at proembryo stage. Degeneration of cellular components particularly in integumentary cells was a common feature observed in these ovules. This study reveals that besides the endosperm failure, which is generally regarded as the main cause of ovule abortion, changes in integumentary cells may also lead to abortion of ovules.

Keywords: *Vigna radiata*, Ovule abortion, TEM, Autophagy, Integument degeneration, Female meiosis, Myelin bodies

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IMPACT OF SUPPLEMENTAL UV-B RADIATION ON FLOWER AND POD FORMATION IN CHICKPEA (*CICER ARIETINUM* L).

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Abstract: Surface level ultraviolet radiation (280-320nm) and ozone are components of the global climate and any increase in their levels can lead to adverse effects on crop growth and productivity on a broad geographic scale. The object of this study was to determine the effect of season long exposure of supplemental UV-B on flower and pod formation in *Cicer arietinum* L. The study revealed that supplemental UV-B radiation promoted the number, fresh weight and dry weight of flower and pod if it was given for 1 hr and 2 hr however 3 hr supplemental UV-B radiation inhibited number, fresh weight and dry weight of flower and pod in *Cicer arietinum* L.

Keywords: *Cicer arietinum*, Supplemental UV-B radiation, Flower, Pod

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SALT TOLERANCE PROTEINS IN DEVELOPING CHILLI FRUIT

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Abstract: The influence of NaCl on different quality attributes such as protein and protease of the Chilli Fruits were investigated during the developmental stages. Electrophoresis analysis of total soluble protein (SDS-PAGE) profile was carried out in order to evaluate the response of chilli fruits to salt stress. Protein content increased with attainment of fruit maturity SDS-PAGE analysis has revealed that plant grown under NaCl (50 and 100mM) showed induction or repression in the synthesis of few polypeptides in green and red fruits. This increase in protein content with increase in fruit maturity indicates that these concentrations of NaCl enhance protein synthesis which increases the ability to cope with salinity.

Keywords: Chilli Fruit, NaCl, Protein Analysis

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SEED PROTEIN PROFILING THROUGH ELECTROPHORESIS IN LENTIL [*LENS CULINARIS* MEDIC]

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Abstract: Lentil (*Lens culinaris* Medic) is an important pulse crop in India with advancement and development of hundreds of varieties and introduction of intellectual property rights it is necessary to identifying them individually for identification and registration purposes. The present investigation was carried out during 2012-2013 in biotechnology lab, Department of genetics & Plant Breeding, C.S. Azad university of agriculture and technology, Kanpur with 14 genotypes of Lentil PL-4, KLS-218, KLS-320, L4147, K-75, KLB-08-4, KLS-09-3, VL-126, JL-1, L84-8, PL-5, KLB-303, IPL-81, DPL-62 for protein profiling through SDS-PAGE.

In present investigation, 14 variety of Lentil were studied for varietal identification through electrophoresis. Protein was extracted from dry seed of lentil varieties and analysed by SDS-PAGE. On the basis of photographs, electrophoregrams, Rm values and dendograms (UPGMA cluster analysis) of banding patterns through SDS-PAGE, results found that the number of protein bands found in 14 genotypes ranged from 12 to 20 with Rm value 0.07 to 0.93 for tris soluble proteins. Protein banding pattern of tris soluble proteins was found more distinct in SDS-PAGE. In UPGMA cluster analysis all the genotypes fall in seven cluster groups. SDS-PAGE for tris soluble proteins found suitable for testing distinctness, uniformity, stability of varieties for registration and identification.

On the basis of results, this can be said for characterization and identification of genotypes of lentil, that electrophoretic profile for tris soluble proteins through SDS-PAGE was resulted distinct banding pattern and act as 'genotypic finger printing'. Therefore, electrophoregram of tris soluble protein in SDS-PAGE was found much better for identification of genotypes in lentil.

Keywords: Lentil, SDS-PAGE, Varietal identification, UPGMA

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VARIABILITY STUDIES IN EGGPLANT (*SOLANUM MELONGENA* L.) FOR CHHATTISHGARH PLAINS

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Abstract: Genetic variability in terms of genotypic and phenotypic coefficient of variances, heritability, expected genetic advance and expected genetic advance as per cent of mean, correlation and path coefficient were studied for fruit yield and its attributing traits in eleven hybrids, seven parents and a commercial check (Pusa Hybrid-6) of eggplant. In general it was noted that the value of phenotypic coefficient of variation were higher than genotypic coefficient of variation. The high GCV and PCV coupled for the traits number of fruits per plant per picking followed by average fruit weight, total number of fruits per plant, number of primary branches per plant, marketable fruit yield per plant, average fruit girth, average fruit length, total fruit yield per plant. The highest heritability estimate was observed for average plant height, average fruit weight, total number of fruits per plant followed by days to 50% flowering, days to first picking, average fruit length, average fruit girth, number of fruits per plant per picking, total soluble solids, number of primary branches per plant, marketable fruit yield per plant and total fruit yield per plant indicating predominance of additive gene action in the expression of these traits. High genetic advance as percent of mean was observed for total number of fruits per plant, followed by number of fruits per plant per picking, average fruit weight, average fruit length, average fruit girth, marketable fruit yield per plant, average plant height, number of primary branches per plant and total fruit yield per plant. Higher heritability estimate coupled with higher genetic advance as percent of mean were observed for total number of fruit per plant, number of fruits per plant per picking, average fruit weight, average fruit length, average fruit girth, total fruit yield per plant, marketable fruit yield per plant, average plant height and number of primary branches per plant and these traits can be improved through simple selection.

Keywords: Eggplant, GCV, PCV, Heritability

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ANALYSIS OF GENETIC PARAMETERS IN M₂ GENERATION OF FIELDPEA (*PISUM SATIVUM* L.)

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Abstract: The Present investigation was undertaken with an objective to assess the induced genetic variability in M₂ generation. The research programme was conducted during *rabi* 2008-09 at field Experimentation center, Department of Genetics and Plant Breeding, SHIATS, Allahabad. The parent material, seeds of PUSA212 variety were irradiated with 10kR, 15kR, 20kR, 25kR and 30kR doses of gamma rays at NBRI, Lucknow. Next day after treatment, the seeds along with control were space planted for raising M₁ generation. Each M₁ plant was harvested separately. Desirable ten M₁ individual plant progenies from each treatment were bulked and laid in RCBD for raising M₂ generation. Induced mutations delivered fairly good amount of genotypic coefficient of variation, phenotypic coefficient of variation, heritability and genetic advance with respect to plant height, number of pods per plant, indicating scope for improving fieldpea yield by selection. The mutants with small pods, tall and increased number of pods per plant were isolated in M₂ generation.

Keywords: *Pisum sativum* L., Gamma rays, Induced variability, Genetic parameters, M₂ generation

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SOWING DATES AND VARIETAL EFFECTS ON LEAF AREA INDEX, MEAN TILT ANGLE AND HEAT SUSCEPTIBILITY INDEX OF WHEAT (*TRITICUM AESTIVUM* L.)

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Abstract: A field experiment was conducted at the Crop Research Center of Govind Ballabh Pant University of Agriculture & Technology, Pantnagar (Uttarakhand) during rabi season of 2008-09 to study the photosynthesis, growth and yield of wheat (*Triticum aestivum* L. emend. Fiori & Paol.) varieties at different sowing dates. The experiment was conducted in split plot design with 4 replications with treatments comprising six wheat varieties on Nov.14, Dec.4 and Dec.24. Delay in sowing adversely affected leaf area index. Reduction in leaf area index at 45, 60 and 75 day after sowing and at anthesis and two week after anthesis stage was observed due to late sowing. High leaf area index was noticed in variety UP 2526 at 75 day after sowing and at anthesis and variety DBW 17 followed by UP 2526 recorded highest leaf area index at two week after sowing. Heat susceptibility index computed for yield and yield attributes indicated that variety Raj 3765 was most heat tolerant variety. High grain yield of a genotype under late sown condition indicated the presence of gene for heat tolerance.
Keywords: Sowing date, Leaf area index, Mean Tilt angle, Heat susceptibility index, Yield

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EFFICACY OF BOTANICALS ON HATCHING AND LARVAL MORTALITY OF MELOIDOGYNE INCOGNITA

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Abstract Botanical extracts of *Azadirachta indica*, *Ocimum canum*, *Mentha spicata*, *Aloe barbedenses*, *Vincia rosea*, *Tagetes erecta*, *Calotropis gigantean*, *Humulus lupulus*, *Datura innoxia*, *Rosa damascene* and *Ricinus comunis* were evaluated for their nematicidal effect against *Meloidogyne incognita* juveniles hatching from egg masses. Results were found that all botanical extracts significantly inhibit/ educe the emergence of juveniles (J₂) from egg masses as compared to control. Among the botanical treatments, extracts of *Azadirachta indica* showed maximum inhibition on the emergence of juveniles from egg masses, maximum effect on larval mortality and minimum gall formation as compared to other plant extracts used.

Keywords: Botanical extracts, *Meloidogyne incognita*, Juveniles

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IMPACT OF FUTURES TRADING ON VOLATILITY IN SPOT AND FUTURES PRICES OF AGRICULTURAL COMMODITIES IN INDIA

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Abstract: The agricultural product's prices are highly volatile. There is considerable time lag between the time of initial spending and procuring of receipts from the final farm produce. A farmer is highly susceptible to price fluctuations of both farm produce as well as farm inputs. Traditionally, this risk is borne mainly by the producer (sometimes by the government) more than the consumer for a variety of reasons. It has made farmers look for alternatives to mitigate the risk. Futures market is one such option. The present study was carried out on NCDEX. The daily spot and futures price data of selected agricultural commodities were obtained from the website of National Commodity and Derivative Exchange (NCDEX), Mumbai. Three commodities *viz.* wheat, refined soy oil and chana were studied for a period of nine years from year 2004 to 2012 as per the availability of data. Auto Regressive Conditional Heteroskedasticity (ARCH) and Generalised Auto Regressive Conditional Heteroskedasticity (GARCH) model were used to achieve the objective of the study. Major findings of the study revealed that, the spot and futures price series of wheat and refined soy oil were significantly volatile. While, that of chana, spot price was found to be non-significant and hence stable, while futures price was found significant and volatile.

Keywords: ARCH, GARCH, NCDEX, Spot prices, Futures prices

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ISOLATION AND AUTHENTICATION OF ENTOMOPATHOGENIC NEMATODES FROM ALLAHABAD REGION

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Abstract: Random surveys were carried out for the detection of entomopathogenic nematodes from cultivated areas in different villages of Allahabad district, Uttar Pradesh, India. A total of 60 soil samples were processed for baiting using larvae of cabbage semi-looper, *Thysanopulsia orichalcea* (Lepidoptera: Noctuidae). Of these, only ten soil samples (16.67%) yielded EPNs. *Heterorhabditis sp.* was yielded from six soil samples (10%) collected from different villages, while *Steinernema sp.* was yielded from four samples (6.7%). However, no EPNs were recovered from soil samples of twelve villages. The nematodes were recovered from sandy, sandy loam and alluvial soils with soil pH ranging from 6.50 to 8.00. The isolated entomopathogenic nematodes were found to be *Steinernema sp.* and *Heterorhabditis sp.* The bioassay of the isolated EPNs was studied under laboratory condition on *Corcyra cephalonica* larvae in different inoculum levels of 50, 100, 150, 200 and 250 IJs/ml. After 120 hours of inoculation the % mortality of the test insect with *Steinernema sp.* was found to be 97.5% with 250 IJs/ml while that of *Heterorhabditis sp.* was found to be 100%. And also the % net mortality after 120 hours of inoculation with 250 IJs/ml of *Steinernema sp.* was found to be 79.6% whereas that of *Heterorhabditis sp.* was found to be 81.6%. Hence it was found out that the dose mortality response on the test insect with isolated *Heterorhabditis sp.* was observed to be more effective than that of *Steinernema sp.*

Keywords: EPN, *Heterorhabditis sp.*, *Steinernema sp.*, *Corcyra cephalonica*

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AN ECONOMIC ANALYSIS OF IMPROVED PADDY CULTIVATION IN BILASPUR DISTRICT OF CHHATTISGARH

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Abstract: An attempt has been made in this paper to examine the economic analysis of improved paddy cultivation in Bilaspur district of Chhattisgarh. The study was conducted in Bilaspur district of Chhattisgarh with thirty farmers who were selected by simple random sampling techniques from four villages. After selection of villages, a list of total paddy growers by traditional method was prepared separately and categorized into three size groups on the basis of their land holding size viz, small (up to 02 ha.) medium (02-04 ha.) and large (above 04 ha.). Ten farmers were selected from each of the size group to collect the required information. The primary data were collected from the paddy producers through well prepared interview schedule for the production year 2011-12. Study revealed that the, on an average material cost was estimated as Rs.8165.40 per ha in which 45.00 per cent share of total material cost constituted by the fertiliser material. The average cost of cultivation of improved paddy was estimated to be Rs.31808.40 per ha and ranged from Rs. 27785.60 to Rs.35912.2 in different size groups. The average gross income of paddy was estimated to be Rs. 75961.60 per ha. The average net income and farm business income was calculated as Rs. 44153.20 and Rs. 60517.10 per ha respectively at sampled farms of improved paddy growers in the study area.

Key word: Break of cost, Cost of Cultivation, Cost concepts

RESOURCE ECONOMICS OF WHEAT CULTIVATION IN CHHINDWARA DISTRICT OF MADHYA PRADESH

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Abstract: An attempt has been made in this study to examine the resource economics of wheat cultivation in Chhindwara district of Madhya Pradesh state. The present study was based on the data collected from a random sample of forty farmers who were selected randomly from four villages. Ten wheat growers from each of the selected village considered to collect the required information on the cost of cultivation aspects of this crop for the present study. The simple mean and average method was used to work out the cost of cultivation of wheat crop. The per hectare cost of cultivation was worked out as Rs.19452.28, Rs.20125.54, Rs. 21722.86 and Rs. 22731.61 per hectare at marginal, small, medium and large farms respectively in the district. The average cost of cultivation was estimated as Rs. 20997.56 per ha. Among the different item of resources used in the cultivation of wheat crop, the share of input and labour cost was accounted 78.51 per cent (Rs. 16485.63) and 21.49 per cent (Rs. 4511.93) of total cost respectively in the study area. Per hectare application of NPK was observed as 143.86 kg; 73.61kg. and 28.53 kg. in the district respectively. The average net return was estimated as Rs. 24863.21 per ha. in the district. The input-output ratio was observed as 1:2.03, 1:2.23, 1:2.26 and 1:2.18 at the different farms respectively with an average of 1:2.18.

Keyword: Input cost, Labour cost, Cultivation, Wheat, Madhya Pradesh

REPRODUCTIVE PHENOLOGY OF DOMINANT TREE SPECIES IN TROPICAL DECIDUOUS FOREST OF HASTINAPUR REGION IN WESTERN U.P.

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Abstract: Flowering and fruiting phenology of 20 selected dominant tree species in tropical deciduous forest of Hastinapur region in western U.P. was observed through fortnightly visit during November 2009 to December 2011 revealed that there exists a strong seasonality for flowering and fruiting phenophases. Reproductive interphenophases duration between phenological events varied for different selected dominant tree species. The fruiting phenology follows closely the flowering phenology. Correlation analysis shows that, there was a positive correlation between the interphenophase duration of production of young fruits (YFr) - maturation of fruits (MFr) and production of young flowers (YF1) - maturation of flowers (MF1) but no correlation was found between the interphenophase duration of maturation of fruits (MFr)- ripening of fruits (RFr) and maturation of flowers (MF1) - abscission of flowers (AF1). Phenological behaviour displayed by the trees are the result of interaction of surrounding biotic and abiotic environment.

Keywords: Correlation, Flowering, Fruiting, Hastinapur, Phenology

CLEOME VISCOSA – BOON OR BANE

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Abstracts: Advent of modern agriculture system, growing energy demands, area development projects, increasing population and many more related activities has led to rapid decline in many plant resources and ultimately erosion of biodiversity from its unique ecosystem. Thus, the biodiversity conservation bodies and legal strategies framed by them are making every effort to conserve plants for the very survival and existence of life on the earth. Tremendous awareness in the field of biodiversity conservation has unravelled the untapped potential of certain unpopular plants like weeds. These undesired plants, if utilized carefully and judiciously, can prove fruitful in decelerating the pressure on the precious plant resources which we are losing due to increasing demands for their products.

Keywords: Agriculture, *Cleome viscosa*, Cleomaceae

CONSTRAINTS IN PRODUCTION AND MARKETING OF MAIZE IN KOREA DISTRICT OF CHHATTISGARH

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Abstracts: Agriculture forms the backbone of the Indian economy and despite concerted industrialization in the last five decades; agriculture occupies a pride of place. Maize is one of the most important cereal crops after rice. Maize is widely cultivated throughout the world, and a greater weight of maize is produced each year than any other grain. In India, maize is grown in an area of 7.7 M ha with a production around 15.1 Mt and productivity 2.0 t/ha it ranks next to rice, wheat, sorghum and pearl millet. Though consumed all over the country, it is the staple food in hilly and sub mountain tracts of northern India. Though consumed all over the country, it is the staple food in hilly and sub mountain tracts of northern India. As a fodder and grain crop .it is extensively grown in Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar and Karnataka. Largest area under maize is in Rajasthan (1.0 M ha) followed by Karnataka (0.93 M ha) while the production is highest in Andhra Pradesh (3.05 Mt) followed by Karnataka (2.65 M t).

Keywords: Grain crop, Production, Maize, Korea district

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COMPARATIVE ASSESSMENT OF BIOSORPTION OF MALACHITE GREEN DYE FROM ITS AQUEOUS SOLUTION BY LIVING AND DEAD HYPHOMYCETOUS FUNGI

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Abstract: The dead biomass of *Aspergillus nidulans* Eidan and *Humicola grisea* Traaen was found to be quite effective in adsorbing the dye malachite green from its aqueous solutions. In most of the case, the dead (autoclaved) biomass proved to be more effective than the living biomass. Changes in surface properties, modification of binding sites and increase in surface area due to autoclaving may be the possible reasons for increase efficiency of dead biomass.

Keyword: Dye pollution, Biosorption, Malachite green, Dead fungal biomass

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PADDY PRODUCTION ECONOMICS IN MAHASAMUND DISTRICT OF CHHATTISGARH

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Abstract: This study was on the Rice Production Economics in Mahasamund District of Chhattisgarh. Primary data were collected using pre structured survey schedule administrated to 123 paddy producers which consists of 47.97 percent marginal, 26.02 percent small , 13.01 per cent medium and 13.01 percent 13.01 large farmers using Three stages stratified random sampling technique. Tabular analysis was used to calculate cost and returns in paddy cultivation in district. Study come up with findings that cost of cultivation increases as farm size increases. Labour cost was the main component of operational cost covering 35.85 percent of total operational cost for all farm sizes. While Rental value of owned land and

rent paid for leased in land was the dominating cost item in fixed cost items covering 40.62 percent of the total fixed cost. Net income, Family labour income, Farm business income, Farm investment income were maximum in case of small farm size *i.e.* Rs. 21703.20, Rs.31259.92, Rs. 44359.85 and Rs. 37775.57 respectively. Calculated net return per rupee of investment was also higher (1:1.66) in small size farm while it was 1:1.55 for all farm size.

Keywords: Paddy, Production, Cost of cultivation, Economic analysis, Farm Size, Input- Output ratio, Farm income

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GRAFT AND DODDER TRANSMISSION OF JATROPHA MOSAIC VIRUS DISEASE

Sanjay Kumar, Rajeshwari Sharma, A.K. Sharma and Manoj Kumar Sharma

Department of Botany and Microbiology, J.V. College, Baraut (Baghpat) U.P.

Abstract: The plant of *Jatropha curcas* L. suffer from several diseases, among them Jatropha mosaic virus disease is a newly emerging disease that challenges the productivity of a prospective biofuel crop, *Jatropha curcas*. Jatropha mosaic virus(JMV) disease could not be transmitted either through the vector aphids or through mechanically, but disease could be transmitted by grafting from donor *J. curcas* to healthy *J. curcas* and also from *J. gossypifolia* to *J. gossypifolia* but not from *J. curcas* to *J. gossypifolia* and vice versa and the disease could also be transmitted successfully through dodder. 80% of the dodder transmitted *J.curcas* plant developed distorted symptoms within 15 days after inoculation.

Keywords: JMV, *Jatropha curcas*, *Jatropha gossypifolia*, Grafting, Dodder

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Keywords: JMV, *Jatropha curcas*, *Jatropha gossypifolia*, Grafting, Dodder

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GENETIC DIVERGENCE ANALYSIS IN DOLICHOS BEAN (*DOLICHOS LABLAB* L.)

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Abstract: An experiment was carried out to identify suitable genotypes for commercial cultivation in Chhattisgarh. Sixty three genotypes of Dolichos bean were evaluated during *kharif* and *Rabi* season of 2009-10. Wide range of variability was observed for all the characters *viz.*, leaf length, leaf width, inflorescence length, number of flower per inflorescence, number of pod per inflorescence, pod length, pod width, number of pod per plant, hundred seed weight and pod yield. The analysis of variance revealed that the high genotypic and phenotypic coefficient of variation were recorded for leaf length (cm), leaf width (cm), inflorescence length (cm), number of flower per inflorescence, pod length (cm), pod width (cm), number of pod per plant, hundred seed weight (g) and pod yield per plant (kg). It was also revealed that relative magnitude of phenotypic coefficient of variation was higher than the genotypic coefficient of variation under the study. Higher heritability coupled with high genetic advance as percent of mean were observed for pod length followed by pod width, length of inflorescence, hundred seed weight, number of flower per inflorescence and number of pods per inflorescence. Correlation and path analysis revealed that number of pod per plant influenced the green pod yield per plant (kg) with high direct effect and significant positive correlation. Through D₂ analysis, all the genotype could be grouped into six clusters and inflorescence length, number of pod per inflorescence, number of pod per plant and green pod yield per plant were found to be major characters

Keywords: Genetic divergence, Correlation, Path analysis, D₂ analysis, Dolichos bean

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EFFECT OF FERTILIZER LEVELS ON RELAY CROPS IN RICE

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Abstract: The effect of varying fertilizer level on relay crops in rice experiment was conducted at Instructional cum research Farm of Assam Agricultural University, Jorhat, during the *khari*f and *rabi* season of 2001-02. The grain and stover yield, rice equivalent yield are significantly affected by the different treatments combination. The highest value recorded at 125 per cent recommended levels of fertilizer. Total N, P and K uptake differed significant due to different treatment. The highest value recorded at 125 per cent recommended levels of fertilizer.

Keywords: Relay crops, Rice equivalent, Stover yield

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GENETIC VARIABILITY STUDIES IN CHILLI (*CAPSICUM ANNUUM*L.)

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Abstract: The present studies were carried out to assess the genetic variability, heritability and genetic advance for different characters in nine genotypes (six lines and three testers) in diverse genotypes of Chilli. The experiment was conducted in RandomisedBlock Design (RBD) with three replications during the *rabi* season 2011-2012 at Department of Horticulture under All India Coordinated research Project on Vegetable Crops, Indira Gandhi KrishiViswavidyalaya, Raipur (C.G.), India. The analysis of variance indicated the sufficient genetic variation among the genotypes from all the characters studied. Among the genotypes KA-2 (580 g/plant) was the highest green fruit yielder. Number of fruits/plant was highest in Indira Chilli-1 (191.00), fruit length was maximum in 2011-03 (10.37 cm) and average per fruit weight in 2011-03 (4.77 g). The high phenotypic coefficient of variation and genotypic coefficient of variation were observed for fruit length, number of seeds/fruit, plant height and fruit weight. High heritability coupled with high genetic advance were observed for all characters studied, except number of primary branches, number of secondary branches, days to first picking, fruit bearing period, fruit width, duration of crop (sowing to last harvest days) indicating these characters are governed by additive gene action.

Keywords: Genetic variability, Genetic advance, Heritability, *Capsicum annuum*

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A STUDY ON PRE-HARVEST FORECAST OF RICE YIELD USING CLIMATIC VARIABLES

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Abstract: A suitable statistical model has been developed for forecasting the yield of the rice in Raipur district (1981-2013) using the data and weekly weather variable viz., average maximum and minimum temperature, relative humidity morning evening sunshine hours and total weekly rainfall. The forecast model was developed using generate weather variables as regression in model. The generated weather variables were developed using weighted accumulated of weekly data on weather variable, weights being the correlation coefficient of the weather variables, in respective weekly with yield. The data for a period of (1981-13) was used to develop the forecast model. The validation of the model was done using the data from (2011-13).

The results revealed that the forecast model developed was able to explain 57% of variation in the rice yield. And it is possible to forecast rice yield successfully two month before harvest.

Keywords: Generate weather variables, Regression weekly data, Correlation Coefficient, Forecast model

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PHARMACOGNOSTIC STUDIES ON THE LEAVES OF *MURRAYA KOENIGII* (L.) SPRENG

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**Homeopathic Pharmacoceia Lab, Department of Ayush, Ministry of Health & Family welfare, Govt. of India, Kamla Nehru Nagar, Ghaziabad - 201001*

Abstract: *Murraya Koenigi* (L.) (Mithaneem) spreng of family, Rutaceae is an important medicinal Plant that has many thereopetic values and contain crystalline glucoside, koenigin, murrayin and resin. The leaves are used as anti-dysentric, anti-vomiting, anti-bacterial, stomachic purposes, anti-inflammatory, anti-feedant. Pharmacognostical studies including macromorphological and microscopic characters such as Palisade ratio, stomatal number, stomatal index, vein-islet number,

veinlet termination numbers, histochemical colour reaction, fluorescence behaviour, extractive values and loss of drying were studied.

Keywords: Pharmacognostic, *Murraya Koenigii*, Rutaceae

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Keywords: Pharmacognostic, *Murraya Koenigii*, Rutaceae

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COMPARATIVE EFFICACY OF NOVEL INSECTICIDES AND BIO- PESTICIDES ON LARVAL POPULATION DENSITY OF GRAM POD BORER (*HELICOVERPA ARMIGERA* HUBNER) ON CHICKPEA

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Abstract: Field study was conducted to determine the comparative efficacy of lambda-cyhalothrin 5 EC, fenvalerate 10 EC, indoxacarb 14.5 SC, quinalphos 25 EC, spinosad 45 SC, neemarin 1500 ppm and *Ha* NPV against the larval population of gram pod borer, *Helicoverpa armigera* on chickpea in the experimental research area of Crop Research Centre of Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut-250110 (U.P.) during Rabi 2011-12. The efficacy of the insecticides was ascertained by comparing treated plots with the control plots. All the insecticides resulted in significant reduction in the larval population density of the pest in comparison with control. However, indoxacarb 14.5 SC proved to be the best insecticide followed by spinosad 45 SC, lambda-cyhalothrin 5 EC, quinalphos 25 EC, fenvalerate 10 EC, neemarin 1500 ppm and *Ha* NPV respectively.

Keywords: Chickpea, Gram pod borer, Larval population

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SCREENING OF SORGHUM GENOTYPE ENOTYPES FOR SHOOT FLY, *ATHERIGONA SOCCATA* RONDANI (DIPTERA: MUSCIDAE) OVIPOSITIONAL BEHAVIOR

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Abstract: The twenty five sorghum genotypes evaluated against shoot fly, genotypes SU 1394, SU 1397 and SU 1400 performed better being less preferred for oviposition on the 14th and 21st day after germination with a mean oviposition of 55.77 and 61.14, 56.84 and 60.00 and 54.75 and 61.33 per cent, respectively and next to resistant check IS 2312.

Keywords: Shoot fly, Oviposition, Dead heart

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CORRELATION AND PATH ANALYSIS IN CHILLI (*CAPSICUM ANNUUM* L.)

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Abstract: Correlation and path coefficient analysis for nine genotypes of chilli were evaluated during *rabiseason* of 2011-12. The studies revealed that green fruit yield per plant had highly significant and positive association with days to 50% flowering at phenotypic and genotypic level, number of primary branches at genotypic level, fruit length at phenotypic level, fruit bearing period and plant height at environmental level. Whereas, path coefficient analysis revealed that among the developmental characters *viz.*, days to 50% flowering, plant height (cm), number of primary branches, secondary branches, fruit bearing period, fruit width (cm), fruit weight (g), stalk/pedicle length (cm), number of seeds per fruit and number of fruits per plant showed high positive direct effect on green fruit yield per plant (g).

Keywords: Correlation, Path analysis, *Capsicum annuum* L.

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APPLICATION OF HYDROLYTIC ENZYME FROM THERMOPILE FUNGUS IN HYDROLYSIS OF LINGO CELLULOSE

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Abstracts: Lignocelluloses biomass refers to plant biomass that is composed of cellulose, hemicelluloses, and lignin. The carbohydrate polymers (celluloses and hemicelluloses) are tightly bound to the lignin. Lignocelluloses biomass can be grouped into four main categories: agricultural residues (including, corn stopper and sugarcane biogases), dedicated energy crops, wood residues (including saw mills and paper mill discards) and municipal paper waste.

Keywords: Enzyme, Fungus, Cellulose