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MODERN VARIETIES FOR SELF SUFFICIENCY OF RICE PRODUCTION IN ASSAM – AN ECONOMETRIC ANALYSIS Sanjoy Borthakur^{1*}, B.C. Bhowmick² and J.P. Hajarika³

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Received-09.06.2015, Revised-22.06.2015 **Abstract:** Rice is the principal crop of Assam, which alone occupies nearly 70 percent of gross cropped area and cover around 80 percent of total food production in the state. Although, the production of rice has increased over the years especially during the recent decades, the productivity is very low as compared to other rice growing states of India. Increase in production through increase in area is not far fetching. Change in productivity is basically technological and hence, more promising. Probit model revealed that in Nagaon district co-efficient of per cent clay soil area (ha.), non-farm income (Rs.) and dummy for extension visit were positively significant. i.e., these factors had significant influence towards adoption of modern varieties in the district. While, in Golaghat district dummy for extension visit and NPK use (kg/ha) had shown significant influence towards adoption of modern varieties. Tobit model estimates revealed that dummy for extension visit and size of household had significant influence towards adoption of modern varieties in both the sample districts towards adoption of modern varieties. Factor analysis showed that amongst the factors considered in Nagaon district, dummy for credit used for production purpose, dummy for extension visit and per cent loamy sand area (ha) were the variables of importance in determining the adoption of modern varieties. Likewise, in Golaghat district Coefficient of Variation of yield (t/ha), dummy for extension visit and number of years in school attended by the household head emerged out to be the important variables in determining the adoption of modern varieties in the district. **Keywords:** Modern varieties, Probit, Tobit model, Factor analysis

NUTRITIONAL STATE AND YIELD REGRESSION BY FOLIAR NUTRIENTS IN APPLE ORCHARDS OF WESTERN HIMALAYAS

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Abstract: A nutritional survey was conducted in major apple growing belts of Western Himalayas viz. Jubbal-Kotkhai, Karsog, Kalpa, Kotgarh and Naggur areas of Himachal Pradesh (India) to study the nutritional wellbeing and effect of foliar nutrient concentrations on influencing yield. The foliar macro-nutrients, N, P, K, Ca, Mg in different locations were found in the range 1.71-2.31, 0.13-0.28, 1.18-1.82, 1.19-1.83 and 0.18-0.41 percent, respectively while the micro-nutrients Fe, Zn, Cu and Mg varied from 186.8-378.2, 17.67-61.01, 7.52-15.78 and 42.33-182.53 ppm. Multiple regressions have been calibrated for predicting apple yields at different locations and for low and high yielding (>150 kg/tree) trees where the models were found to have a high and significant predictability value. Using the data, fertilizer adjustment equations can be developed for prescribing optimum fertilizer doses for attaining high yields in the apple production areas in the Western Himalayas and indeed elsewhere with similar climatic and soil conditions.

Keywords: Nutrition, Apple, Essential nutrients, Regression plane, Sufficiency range

ESTIMATION OF COMPONENTS OF GENETIC VARIANCE AND GRAPHICAL ANALYSIS IN FIELD PEA (*PISUM SATIVUM* (L.) VAR. *ARVENSE*)

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Abstract: Genetic analysis was carried out by 8 x 8 diallel analysis (excluding reciprocals) of Field pea (*Pisum sativum* (L.) var *arvense*) genotypes. The results of t₂ test indicated the fulfillment of assumptions required under diallel analysis for all the characters under study except number of primary branches, grain yield (g) and harvest index (%). Narrow sense heritability was low for number of seeds per pod and most of the other trait except Days to 50% flowering and plant height which had moderate to high heritability. A higher proportion of dominant genes were observed in parent PRAKASH for affecting number of pods per plant. The parental line ADARSH was found having maximum recessive gene for increasing the protein content.

Keywords: Degree of dominance, Diallel, Fieldpea, Gene action

ESTIMATION OF COMPONENTS OF GENETIC VARIANCE AND GRAPHICAL ANALYSIS IN FIELD PEA (*PISUM SATIVUM* (L.) VAR. *ARVENSE*)

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Keywords: Degree of dominance, Diallel, Fieldpea, Gene action

HONEYBEE – A NATURAL POLLINATOR IN INCREASING THE SEED YIELD AND INCOME IN THE NIGER (*GUIZOTIA ABYSSINICA* CASS) A TRADITIONAL TRIBAL CROP OF SOUTH GUJARAT REGION

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Abstract: Niger (*Guizotia abyssinica* Cass) is one of the important minor oilseed crop of hilly regions and it is used for oil purpose only by the tribal people. Therefore a study was planned to document about the role of honeybees as a pollinator in increasing the seed yield in Niger crop with paired plot technique at the Niger Research Station (NRS) at Navsari Agricultural University (NAU) and at farmer's field, Vanarasi, Navsari, Gujarat and also studied its cost benefit ratio (CB) of Niger cultivar. The trial was conducted at Niger Research Station (NRS), Vanarasi in 2014-15 and at farmer's field to ascertain the involvement of honey bees (*Aphis mellifera*) in escalating the seed yield of Niger crop (Due to pollination) and its effect on income due to increase in the Niger seed yield. Significant differences were observed for number of capitula/plant, number of seeds/capitula, 1000 seed weight and seed yield in both the location. However, the seed yield and gross returns were considerably higher in first location of T1 Natural plot/ open pollinated with Bee hive (*Aphis mellifera*). The maximum seed yield of 275 Kg/ha with the gross return of Rs. 16,500/- was obtained in this treatment.

Keywords: Niger, Honeybee, *Aphis mellifera*, Pollination

EFFECT OF AUXIN AND SIMULATED ACID RAIN ON THE SULPHUR CONTENT IN THE LEAVES OF *CAPSICUM FRUTESCENS* VAR. *SWEET MAGIC*

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Abstract: Sulphur compounds of plant as well as of animal origin are of immense medicinal interest as they cure a number of ailments. For instance, thiazoles are antibiotic (e.g. Penicillin), anti-microbial (e.g. Sulphathiazoles). They are vitality factors (for instance, Vitamin – B₁) & act on central nervous system besides other functions. Compounds of plant origin are safer in comparison to synthetic compounds. Therefore, we planned to enhance sulphur contents in the plants of Capsicum. For this purpose *Capsicum frutescens* var. *sweet magic* was treated with simulated acid rain of the pH 3.0, 4.0 & 5.0; auxin (indole acetic acid) solutions of 1.0 x 10⁻⁵, 1.0 x 10⁻⁶ & 1.0 x 10⁻⁷ M concentrations as well as interactive effects of pH – auxin binary solutions of different combinations (3.0 + 1.0 x 10⁻⁵ M, 3.0 + 1.0 x 10⁻⁶ M, 3.0 + 1.0 x 10⁻⁷ M; 4.0 + 1.0 x 10⁻⁵ M, 4.0 + 1.0 x 10⁻⁶ M, 4.0 + 1.0 x 10⁻⁷ M & 5.0 + 1.0 x 10⁻⁵ M, 5.0 + 1.0 x 10⁻⁶ M, 5.0 + 1.0 x 10⁻⁷ M) & their effect on the sulphur contents of leaves of *Capsicum frutescens* var. *sweet magic* were studied. Best pH for sulphur content is 3.0 [sulphur content at 60th day = 155.86 % of control] & best auxin concentration is 1.0 x 10⁻⁵ M [sulphur content = 141.77 % of

control at 45th day] . Best combination of pH & auxin is 3.0 + 1.0 x 10⁻⁶ M [sulphur content = 198.85 % of control at 60th day] . Moreover , acid rain & auxin assist each other towards enhancement of sulphur content in leaves.

Keywords: *Capsicum Frutescens* var. *sweet magic*, Simulated acid rain (SAR), Auxin (indole acetic acid)

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VARIATIONS IN BOD AND COD AT VARIOUS STAGES OF BIOGAS PRODUCTION USING DIFFERENT AGRICULTURAL WASTES

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Abstract: Cow dung along with other agricultural wastes (press mud, poultry litter, kitchen wastes, maize stalks and fruit wastes) were used for the biogas production in lab scale. For each treatment 750 g of substrate and 1500 ml of water was used as inoculum mixture in 3 liters glass bottles. Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) was estimated at various stages of gas production. BOD and COD of the slurry samples was more in the substrates initially before anaerobic digestion but later reduced gradually by the end of gas production which implies the effect of anaerobic digestion on the reduction of BOD and COD and this indirectly leads to the reduction in the environmental pollution.

Keywords: Agricultural wastes, Anaerobic digestion, Biological Oxygen Demand, Chemical Oxygen Demand

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CALCIUM INTERACTION WITH CdCl₂ INDUCED EFFECTS ON SEEDLING GROWTH AND METABOLISM OF VIGNA MUNGO L. AND SOLANUM MELONGENA L.

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Abstract: In the present research work surface sterilized seeds of *Vigna mungo*. L. and *Solanum. melongena* L. were raised to analyzed changes in germination, seedling growth, chlorophyll contents, nitrate and nitrite reductase activity under CdCl₂, CaCO₃ stress singly and in combination 10⁻² M+200 ppm, 10⁻⁴ M +100 ppm 10⁻⁵ M+50 ppm, 10⁻⁸ M+25 ppm and control were investigated. Observations were recorded at 3, 5, 7, 10, 30, 45 and 60th day of sowing displayed significant decrease in all the attributes of both crop plants on CdCl₂ application However, activity of nitrate and nitrite reductase, seedling growth, and chlorophyll contents were enhanced in lower Cd stress 10⁻⁸ M. Application of CaCO₃ shows the more elevations than CdCl₂ singly while combined effect of Cd+Ca is more pronounced in comparison to their individual effects.

Keywords: CaCO₃, NR activity, Chlorophyll contents, *Vigna mungo*. L. and *Solanum. melongena* L.

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CORRELATION OF THE ENVIRONMENTAL FACTORS WITH THE BACTERIAL BLIGHT DISEASE OF COTTON CAUSED BY XANTHOMONAS CAMPESTRIS PV. MALVACEARUM UNDER SOUTH GUJARAT CONDITION

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Abstract: Bacterial blight (BL), caused by *Xanthomonas campestris* pv. *malvacearum* (Smith) Dye, is a common disease affecting the growth, development and yield of cotton crop. Field trial was conducted for a season to determine the influence of environmental conditions representing rainfall periods, temperature and humidity on development of disease incidence. Bacterial blight disease infestation was recorded with its first appearance and subsequently at weekly interval till it prevailed on cotton G.Cot.Hy. 12 variety. The result indicated that the disease was first appeared in 32nd standard week (First week of August) with 2.66 % intensity and prevailed up to 47th Met. Week *i.e* third week of November (1.37 %) with its peak during 38th week *i.e*. September 3rd week (24.75 %) and then it gradually decreased.

Keywords: Bacterial blight, Epidemiology, *Xanthomonas campestris* pv. *malvacearum*

VARIABILITY AND DECOMPOSITION ANALYSIS OF CEREALS PRODUCTION ACROSS DIFFERENT AGRO-CLIMATIC ZONES OF UTTAR PRADESH

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Abstract: Present study is based on the secondary information collected on area, production and productivity of cereal crops grown among different agro climatic zones of Uttar Pradesh. The variability and decomposition analysis were analysed to measure the variation and decomposition analysis in area, production and productivity of cereals during three phases i.e 1981-82 to 2011-12. The decomposition analysis indicates increase in production of cereals was due to positive area and yield effect. The contribution of yield effect was greater than area effect in increasing the production of cereals in the state. Variability in area, production and productivity was also observed lowest i.e 1.34 per cent, 3.35 per cent and 3.43 per cent respectively during 2001-02 to 2011-12 and highest i.e 1.91 per cent, 6.17 per cent and 5.21 per cent respectively.

Keywords: Area, Cereals, Decomposition Analysis, Production, Productivity, Variability

ROLE OF ALOE VERA GEL COATINGS IN PROLONGING SHELF LIFE OF BANANA

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Abstract: The present study was carried out to evaluate the ability of *Aloe vera* gel based herbal coatings to reduce the loss of post harvest fruit quality in banana. Unripe green banana fruits were coated with different formulations of Aloevera gel. The coated and uncoated fruits were stored at 25°C in polypackaging and in open as well for 12 days. Visual, Firmness and sensory characteristics and marketability were analysed at regular intervals during the storage period. The coated fruits survived the storage period for 12 days in polybags and 10 days in open condition whereas all the uncoated controls decayed within 4-5 days in open and polybags respectively. The coatings controlled the PLW, ripening process and decay to a great extent and there by extended the shelf life and quality of the fruits. The effectiveness of AG coating was found to improve on incorporation of citric acid. This is probably the first study on utilizing an herbal alternative to extend the shelf life of banana.

Keywords: *Aloe vera*, Banana, Coating, Shelf life, Polypackaging

A REVIEW ON THE USE OF NICOTINE BASED INSECTICIDES IN INSECT PEST MANAGEMENT

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Abstract: The green revolution in our country paved the pathway for intensive and indiscriminate use of chemical pesticide which caused serious hazardous to human being and their environment a part for increasing trends to resistance in insects. The ill effects of chemical pesticides have once again focused our attention to use the pest control. It is well known that natural pesticides are ecofriendly and are safe to the non target organisms. The tobacco plants have been recognized for its insecticidal properties. A number of nicotine based insecticides with unique mode of action were registered during the late 1990s and early 2000s for insect control in agriculture. These new insecticides have several advantages over older groups of insecticides.

Keywords: Nicotine, Insecticides, Insect

FLORAL PHENOLOGY OF *TRICHOSANTHES CUCUMERINA* L. – A MEDICINALLY IMPORTANT CUCURBIT

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Abstracts: *Trichosanthes cucumerina* L. is an annual cucurbit popularly known as “Jangali Chachinda” in hindi. It is widely distributed in tropical regions of Bangladesh, India, Nepal, Pakistan, Srilanka, Myanmar, Vietnam, Indonesia, Malaysia and Phillipine (Sandhya *et al.*, 2012). The fruits of the species are relished as a vegetable and are known to have good nutritional value. The plant is also rich in flavonoids, carotenoids and phenolic compounds. It holds promising place in the Ayurvedic and Siddha system of medicine due to its various medicinal values like antidiabetic, hepatoprotective and cytotoxic effects (Sandhya *et al.*, 2010).

Keywords: *Trichosanthes cucumerina*, Monoecious, Nocturnal, Reproductive efficiency

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EVALUATION OF AVAILABLE MICRONUTRIENTS (Fe & Cu) STATUS IN BLACK SOILS OF BAMBHANIDIH BLOCK IN DISTRICT JANJGIR-CHAMPA OF CHHATTISGARH

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Abstract: A Study was undertaken to evaluate the micronutrients status of Bambhanidih block in Janjgir- Champa district, Chhattisgarh covering 32 villages during 2011-2012. The systematic collection of samples was carried out in geo-referenced surface (0-0.15m) soils samples from 575 sites representing *Alfisols* and *Vertisols* using Global Positioning System. The samples were analyzed for DTPA-extractable iron and copper content. The statistical description of soil characteristics indicated the available Cu and Fe content ranged from 0.2 to 12 and 4.1 to 57.1 mg kg⁻¹ with mean 1.7 and 23.1 respectively. The available copper and iron content showed high level in soils of Bambhanidih block

Keywords: Micronutrients, Iron, Copper, *Alfisols*, *Vertisols*