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PROBIOTICS: RECENT ADVANCES AND FUTURE PROSPECTS

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Abstract: Probiotics are the microorganism which imparts beneficial effect in the human body. The consumption of probiotic in the form of powder, capsule and drinks restore the beneficial microflora in gut and in turn help the human being by enhancing immune system. The present review focusing on the role of probiotics for its possible role in controlling and treating diseases such as urinary tract infection, diarrheal disease caused by bacteria, oral infection i.e. gingivitis, oral cavity and cancer. This review also focuses on regulation, side effect, safety and future prospects of probiotics.

Keyword: Probiotics, UTI, Oral hygiene, Diarrhea

PESTICIDES APPLIATIONS AND THEIR PERSISTANCE IN VEGETABLES

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Abstract: Although pesticide application is an essential component of modern crop production technology, however, in recent years, contamination of food commodities especially the vegetables, with trace amounts of these chemicals has become a growing issue for the general population. Unfortunately the debate has restricted to the quality standards and norms pertaining to drinking water and foods at the point of consumption. But more fundamental source of contamination of natural resources including food products with chemical pesticide residues at the farming level is of serious concern, because of their persistence or presence and often ignored. Without solving this problem at basic level, setting down the quality standards at the consumption level is not going to solve the problem, especially in developing countries like India where enforcement of rules and regulations is very weak or absent. Although some pesticides application have banned but still their residues are being reported in food products and natural resources like soil and water due to its high persistence and low biodegradability. Therefore, it is essential to create awareness amongst consumers and producers about health risks and production practices like non-pesticidal management activities should be encouraged for healthy and safe environment.

Keyword: Pesticides application, Vegetable crops, Drinking water, Health hazards

SURVEY OF MYCOFLORA AND MYCOTOXIN CONTAMINATION IN DRIED DATE PLUM PERSIMMONS (*DIOSPYROS LOTUS L.*) FROM MARKETS OF JAMMU PROVINCE

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Abstract: The present investigation was designed to analyze moulds and mycotoxins responsible for biodeterioration of the market samples of dried fruits of date plum persimmon (*Diospyros lotus* L.). A total of 31 fungal species were isolated from 65 samples by two different isolation techniques. Assessment of mycobial load exhibited the presence of many such fungal species that are broadly acknowledged as the most important mycotoxin producers. Mycotoxins were assessed by high performance liquid chromatography (HPLC). The mycotoxins detected were aflatoxins, ochratoxin A and patulin. Out of 65 samples, 69.23% of dried date plum persimmon samples were found contaminated with aflatoxins in the range of 0.78-798.34µg/kg and 47.69% samples have ochratoxin A (OTA) contamination (0.76±432.09µg/kg). Patulin was quantified in 32.30% samples in the range of 0.89-123.90µg/kg. The present study constitutes the first report of fungal and mycotoxin contamination in dried date plum persimmons from India.

Keyword: Mycoflora, Mycotoxin, *Diospyros lotus*, Survey

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BIOEFFICACY OF HERBICIDES AND EUCALYPTUS OIL FOR WEED MANAGEMENT AND THEIR EFFECT ON CROP GROWTH IN RICE (*ORYZA SATIVA* L.)

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Abstract: Severe competition from weeds is one of the most important factor affecting productivity and sustainability of rice. The present investigation was conducted during rainy seasons of 2011 and 2012 at Norman E. Borlaug Crop Research Centre, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar to determine the bio-efficacy of various herbicides and eucalyptus oil as well as their effect on crop growth and yield of transplanted rice. The treatments included four herbicides viz. butachlor, penoxsulam, bispyribac sodium and mixture of cyhalofop butyl with penoxsulam and eucalyptus oil at different concentrations. *Paspalum scrobiculatum*, *Leptochloa chinensis*, *Alternanthera sessilis*, *Ammania baccifera* and *Cyperus difformis* were the dominant weeds. Results indicated that butachlor, penoxsulam (22.5 g), bispyribac sodium and cyhalofop butyl+penoxsulam were very effective in controlling all the weeds and reducing their biomass except *Alternanthera sessilis* and *Leptochloa chinensis*. Eucalyptus oil (5%) was found to be effective against weeds but its efficacy was lower than the herbicides. Highest yield was obtained in penoxsulam (22.5 g) followed by butachlor and bispyribac sodium treatments. The higher grain yield of rice could be attributed to higher values of the physiological growth parameters relative growth rate (RGR), crop growth rate (CGR) and leaf area index (LAI).

Keyword: Bio-efficacy, Eucalyptus oil, Herbicides, Physiological growth parameters

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EFFECT OF DIFFERENT MULCHES AND BIOFERTILIZERS ON QUALITATIVE AND QUANTITATIVE ATTRIBUTES OF TOMATO

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Abstract: The present studies were carried out at Experimental Farm of the Dr Y S Parmar U H F, Horticulture Research Station, Kandaghat, Solan, Himachal Pradesh during Kharif season of 2011 and 2012 to find out the effect of mulches and biofertilizers on different genotypes of tomato. The experiment was laid out in Split-Split Plot Design

(SSPD) comprising of 27 treatments having combinations of three genotypes (V₁-Naveen 2000⁺, V₂-Sun-7711 and V₃-Solan Lalima), three mulches (M₀-No mulch, M₁-Pine needle mulch and M₂- black polyethylene) and three biofertilizers (B₀-recommended NPK, B₁-100 % NPK + *Azotobacter* (1g/plant) + PSB (1g/plant) and B₂-75 % NPK + *Azotobacter* (1g/plant) + PSB (1g/plant) replicated thrice. Among varieties, maximum yield was observed with the variety V₂ (Sun-7711), but the fruit quality characters were observed with the variety V₃ (Solan Lalima). Among the mulch materials the M₂ (Black polythene) and biofertilizers B₁ (100% NPK + *Azotobacter* (1g/plant) + PSB (1g/plant) were recorded to be the best regarding the fruit yield and quality. The first order interactions viz., varieties x mulch, biofertilizers x mulch and varieties x biofertilizers significantly affected most of the characters under study. Maximum fruit yield was obtained with treatment combinations of V₂M₂ (Sun-7711 applied with black polyethylene mulch), B₂M₂ (75% NPK + *Azotobacter* (1g/plant) + PSB (1g/plant) applied with black polyethylene mulch) and V₂B₂ (Sun-7711 with 75 % NPK + *Azotobacter* (1g/plant) + PSB (1g/plant). Further in three factor interaction, the highest fruit yield (1037.33 q/ha) was obtained with the treatment combination of Sun-7711, 75% NPK + *Azotobacter* (1g/plant) + PSB (1g/plant) and black polyethylene mulch (V₂B₂M₂).

Keyword: Biofertilizers, Mulch, Genotypes, *Azotobacter*

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STUDY OF TEMPORAL RAINFALL SCENARIO ON MACRO TO MICRO LEVEL AREAS

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Abstract: The present study of the twenty five years (1990 to 2015) temporal data of rainfall of India (Country) to Uttar Pradesh (State) and Western U.P. (a part) to Meerut (District) studied to understand pattern of annual and monsoon rainfall. The average normal monthly rainfall of study area of country level to state and District level are observed in India 1152.3mm, in U.P. 955.3mm, in Western U.P. 743.2mm & in Meerut 836.7mm. The long term data analysis of year wise June, July August and September contributes rainfall in India 867.3mm, in U.P. 825.7mm, in Western U.P. 653.4 and in Meerut 692.2mm in south west monsoon rainfall season respectively. The overall study of temporal data of rainfall observed 251% rainfall in the part of Western U.P. whereas observed minimum 80% in the India level. The cumulative study of rainfall data observed in India the cumulative values are observed negative in years 1990-1993 & 2001-2014 The western U.P. positive values in year 1990-1994, 1997 & 2009 to 2015 whereas in Meerut district observed cumulative negative in year 1990 to 1993 & 2015. The overall study of data overall in India has lowest in normal (39%) whereas monsoon rainfall observed 33% precipitation ratio. The monsoon rainfall anomaly were observed in years of 1994 (1.74) , 2008(2.13), 2003 (2.15) & 1.56 (1994) showing the highest positive normal rainfall anomaly in India, U.P., Parts of Western U.P. & Meerut respectively. In future, expected normal annual and south west rainfall may be less in year 2030 observed 1005.1mm, 513.4 & 725.7 India, Parts of Western U.P. & Meerut district respectively whereas the monsoon rainfall future expected rainfall are observed in India 812.5mm, in Parts of Western U.P. 417.5mm & in Meerut district 246.3mm. The expected annual & monsoon rainfall in year 2016 to 2030 rainfall patterns are declining stage. This is dynamic view to overall scenario of long term data study of future prospect.

Keyword: Anomaly, Drought, Monsoon, Precipitation, Western U.P.

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PHENOTYPIC EVALUATION OF SPRING WHEAT IN TWO DIFFERENT ENVIRONMENTS

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Abstract: Wheat is one of the most important crop and primary sources of calories for millions of people world-wide. World nutrition mostly depends on wheat and its products. Different climatic and other environmental changes accentuate the requirement for breeding strategies that deliver both an extensively increase in yield potential and resilience to dangerous weather events such as frost, heat waves, and drought. Heat stress around sensitive stages of wheat development has been identified as a possible threat to wheat production in different countries including India. In the present study, we phenotypically evaluated 324 SWRS (spring wheat reference set) wheat genotypes in two different environments. We used different parameters for selection of heat tolerance genotypes like, ANOVA, CV (%), % Decline, Heat susceptibility indices (MP, STI, TI, TSI, TOL, HSI), heritability and correlation for all the 11 quantitative traits and Shannon-Weaver Index (H) was used for two qualitative traits like, leaf glaucousness and leaf rolling.

Keywords: Wheat, Abiotic stress, High temperature, Genetic improvement

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IMPACT OF GRAZING ON SOIL ATTRIBUTES IN A PART OF NANDA DEVI BIOSPHERE RESERVE, UTTARAKHAND, INDIA

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Abstract: Livestock is one of the main cause has different effects on different parts of range ecosystem. An effective factor is the number of livestock when it is beyond the capacity of the rangeland and it has different effects on soil and plants with different intensities of grazing. This studies measured short-term effects of grazing on soil attributes in sub-alpine rangelands in a part of Nanda Devi Biosphere Reserve (NDBR). To study the effect of grazing impact on soil attributes such as the P, K, organic carbon and pH in the three sites of NDBR; Toli Laga Chiae (Less Grazed), Salud Dugra (Medium Grazed) and the Tapovan (Heavy Grazed) systematic random soil sampling was conducted at 0-20 cm depth and nine samples were collected per site. The result was compared with the all sites. Result revealed that elements such as phosphorus and potassium in the heavy grazed site are more than the less grazed site. However, Organic carbon is more in less grazed site but it's significantly differs from all the sites. One way Anova was used to analyze the variance.

Keyword: Ecosystem, Grazing, Biosphere reserve, Soil

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TRADITIONAL USES OF SOME COMMON MEDICINAL PLANTS BY THE LOCAL PEOPLE OF KOTDWARA REGION, UTTARKHAND (INDIA)

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Abstract: Present communication embodies the traditional knowledge of medicinal plants used by the locals of Kotdwara region, Uttarkhand (India) and the ethnomedicinal data gathered from traditional healers (vaid) who inhabit the study area. During the present study, a total of 70 medicinal plants have been identified that belongs to 44 families. Apart from being used for medicinal purpose; some of these providing vegetables and fruits were cultivated on large scale for commercial purpose viz. *Beta vulgaris*, *Citrus aurantifolia*, *Carica papaya*, *Embllica officinalis*, *Musa paradisiaca*, *Syzygium cumini*, *Punica granatum*, *Psidium guajava* and *Momordica charantia*. Some other plants namely *Coriandrum sativum*, *Cuminum cyminum*, *Curcuma longa* and *Zingiber officinale* were used by the local peoples as spices and flavoring agents. Further studies on these medicinal plants can lead to the isolation of various photochemicals from them that can be used for health care.

Keyword: Kotdwara, Medicinal, Traditional, Extract, Decoction

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EFFECT OF DIFFERENT TILLAGE PRACTICES AND IRRIGATION SCHEDULE ON THE GROWTH AND YIELD OF LINSEED IN ALFISOLS OF CHHATTISGARH PLAINS

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Abstract: The field experiments was carried out at the Research-Cum-Instructional Farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh) to evaluate the effect of different tillage practices and irrigation schedule on the growth and yield of linseed in *Alfisols* of Chhattisgarh plains during two consecutive *rabi* seasons of 2009-10 and 2010-11. The experiment was laid out in strip-plot design with three replication. The horizontal strip treatments consisted of four tillage practices *viz.*, zero tillage (T₀), harrowing once (T₁), rotavator once (T₂) and conventional tillage (T₃) and vertical strip treatments consisted of four irrigation schedules *viz.*, one at after seeding (I₀), one at 35 DAS (I₁), two at 35 and 75 DAS (I₂) and three at 0, 35 and 75 DAS (I₃). Result indicated that plant population, plant height, dry mater accumulation plant⁻¹, number of branches plant⁻¹, leaf area index and yield were found significantly higher under conventional tillage (T₃) as compared to others. Among the irrigation schedules, treatment I₃ (three irrigations at 0, 35 and 75 DAS) recorded significantly maximum plant population, plant height, dry matter accumulation, number of branches plant⁻¹, leaf area index and yield.

Keyword: Tillage practices, Irrigation schedule, Growth and development, Linseed

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OCCURRENCE OF INSECTS AND DISEASES IN SOLANACEOUS VEGETABLE CROPS AS PERCIVED BY THE FARMERS IN REWA DISTRICT (M.P.)

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Abstract: Cultivation of vegetables is now becoming a viable commercial enterprise with the introduction of liberal trade policies, prospects for export of vegetables. Solanaceous vegetables *viz.*, brinjal, chilli, potato and tomato are grown throughout the year in all parts of the country in an area of 32.98 lakh ha. with the production of 441.7 lakh tonnes. The study was carried out in Rewa district of M.P. to assess the occurrence of insects and diseases in solanaceous vegetable as perceived by farmers. It was found that in solanaceous vegetable crops there was maximum infestation reported by insect shoot & fruit borer, stem borer, hadda beetle, thrips, white fly, mites, cut worm and tuber moth. The study revealed that there was severe incidence reported by phomopsis blight followed by Little leaf, damping off, leaf curl, fruit cracking, late blight, early blight, black heart, anthracnose. The constraint of experienced by the farmers regarding management of insects and diseases may be arranged in descending order as lack of trials/demonstration followed by lack of proper training for management and high cost of insecticides/pesticides. The study suggested that trails and demonstration should be conducted on farmer's field.

Keyword: Occurrence, Insect-diseases, Constraint, Crop, Vegetable

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VANISHING ACER CEASIUM: AN RET TREE SPECIES OF NORTH WEST HIMALAYAS

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Abstract: India is recognized as one of the mega biodiversity centres and the 3rd largest repository of the earth's genetic wealth (Karihaloo, 2007). According to an estimate, as many as 5285 species of angiosperms belonging to 40 genera are endemic to the country (Annual Report, BSI 2001). A relatively recent report has raised the number of genera to 49 now (Irwin & Narasimhan, 2011). Western Ghats of India are known to possess the highest percentage of the endemic taxa; approximately 48% out of total of 4000 species existing here are said to be endemic (Gopalan & Henry, 2000). The Indian Himalayan Region is another important centre of endemism (Samant *et al.*, 1998); As mega biodiversity hotspot (Myers *et al.*, 2000), it covers approximately 18% of country's total geographical area (Anonymous, 1992) and comprises of about 10,000 plant species of which 3160 are endemic (Samant *et al.*, 1998). This region also supports 121 rare and endangered plant species (Nayar & Sastry, 1987; 1988; 1990). The dependence of humans and livestock on this plant diversity is well known phenomenon since time immemorial (Samant & Dhar, 1997).

Keyword: Biodiversity, *Acer ceasium*, Tree, Himalayas

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EFFECT OF DIFFERENT SOURCES OF NUTRIENTS ON GROWTH AND YIELD OF ONION (*ALLIUM CEPA* L.)

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Abstract: A field experiment was conducted during *Rabi* season 2016-17 to find out the effect of FYM and Vermi Compost with or without PSB and Azotobactor and rates of organic manures (50% and 100% RND) on growth attributes and yield parameters of onion (Agri Found Dark Red) on clay loam soil. The treatments comprised of organic, inorganic fertilizer and biofertilizers with ten treatments 100% RDF through inorganic, 100% RDF through FYM (N Basis), 100% RDF through vermicompost, 50% RDF through Inorganic Fertilizers + 50 % through FYM, 50% RDF through Inorganic Fertilizers + 50 % through vermicompost, 50% RDF through Inorganic Fertilizers + 50 % through FYM + PSB, 50% RDF through Inorganic Fertilizers + 50 % through vermicompost + PSB, 50% RDF through Inorganic Fertilizers + 25 % vermicompost + PSB, 100% RDF through FYM (N Basis) + PSB + *Azotobactor* and 100% RDF through vermicompost + PSB + *Azotobactor*. Results revealed that the application of organic manure significantly influenced the plant height (cm), number of leaves, fresh weight of leaves (g plant⁻¹) and dry weight of leaves (g plant⁻¹) with 100% RDF through Vermicompost + PSB + *Azotobactor* at 30 and 60 days of transplanting. The diameter of bulb (cm), bulb weight (g) and bulb yield (q ha⁻¹) significantly increased with 100% RDF through Vermicompost + PSB + *Azotobactor*.

Keyword: Growth, Onion, Nutrient, Yield

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EVALUATION OF DIFFERENT BOTANICALS AND BIOPESTICIDES AGAINST *HELICOVERPA ARMIGERA* ON MARIGOLD

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Abstract: The different botanicals and bio-pesticides were tested against the natural incidence of the *Helicoverpa armigera* on marigold crop var. Morden during *Rabi*2016-17. The experiment was undertaken in a randomized block design (RBD) with seven treatments viz, HaNPV (250 LE) @ 2ml/ litre, NSKE @ (5%), *Bacillus thuringiensis* @ 2.5g/litre, Neem oil @ 4ml/litre, *Beauveria bassiana* @ 4gm/litre, Karanj oil @ 5% and Untreated control in three replications with 3 x 2.5 m² plots and row to spacing of 60 x 30 cm. In all two sprayings were undertaken so as to evaluate the effectiveness of the treatments and it were observed that the larval incidence at 1, 3, 5, 7 and 10 days after both spraying was lowest in plots sprayed with HaNPV. However the next best treatments in the order of effectiveness for the control of *Helicoverpa armigera* were NSKE 5%, *Bacillusthuringiensis*@ 2.5 gm/litre, Neem oil @ 4ml/litre, *Beauveriabassiana* @ 4ml/ litre, Karanj oil @ 5%.

Keyword: *Beauveria bassiana* and *Bacillus thuringiensis*, HaNPV, Marigold, NSKE

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PLANT - POLLINATOR AND PLANT – HERBIVORE INTERACTIONS - A COMPARATIVE STUDY IN TWO SPECIES OF *LUFFA*

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Abstract: Among various plant–animal interactions occurring around us, pollination and herbivory are prominent ones. While the former exemplifies a mutualistic relationship, the latter is reverse of it. Pollinators by their visits influence both quantity and quality of pollen reaching the surface of stigma [6] [13]. Herbivores on the other hand affect plant by impairing its foliage, deterring pollinators and cause loss of pollen and ovules [9] [5]. In order to analyze these relationships and their correlation with reproductive success, studies were conducted in two species of *Luffa* (family – Cucurbitaceae) namely *L. cylindrica* and *L. acutangula* growing in Jammu division of J&K state, India (area of study). Interestingly one among the two was found to be reproductively more efficient and less affected by herbivory.

Keyword: Pollinator, Herbivory, Mutualistic relationship, Reproductive efficiency