

# Journal of Plant Development Sciences

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#### CHEMICAL AND BIOLOGICAL CONTROL OF PATHOGENIC *ASPERGILLUS* SPP.

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**Abstract:** Six antibiotics [viz. amphotericin-B (AP), clotrimazole (CC), fluconazole (FLC), itraconazole (IT), ketoconazole (KT) and nystatin (NS)] and six bacteria (viz. *Bacillus licheniformis*, *B. haloduran*, *B. cohnii*, *B. subtilis*, *Pseudomonas* sp., and *Rhizobium* sp.) were tested for their antifungal activities against two pathogenic fungi *Aspergillus flavus* (102566) and *A. niger*, which cause a significant yield loss in many important crops during pre- and post-harvest periods. Antibiotics susceptibility test for six antibiotics revealed the antifungal activities of five antibiotics, FLC being ineffective against the test pathogens. Out of the six bacteria, two (*Pseudomonas* sp. and *Rhizobium* sp.) were found to show antifungal activities against both the test pathogens; while, all four *Bacillus* spp. were found to be ineffective against *A. flavus* and *A. niger*. The investigation revealed that the chemical and biological agents can be effectively used against the fungal pathogens.

**Keywords:** *Aspergillus* spp., Antifungal activity, Antibiotics, Biological control, *Pseudomonas* sp., *Rhizobium* sp.

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#### EFFECT OF SIMULATED ACID RAIN ON THE MORPHOLOGY, DRY WEIGHT FRACTION AND NET PRIMARY PRODUCTIVITY OF *SOLANUM MELONGENA*.

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**Abstract:** Proper growth of plants is essential for high productivity of food grains and vegetation which may be affected by pollutants in environment. As a part of study of the effect of acid rain on plants, its impact on the morphology, dry weight and net primary productivity was studied. Results of study are being discussed in present publication.

**Keywords :** *Solanum melongena*, Acid rain, Dry weight fraction, Net primary productivity

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## **SURVEY OF WEED FLORA IN WHEAT FIELDS OF DISTRICT RAJOURI (J&K), INDIA**

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**Abstract:** The present communication pertains to survey of weed flora in wheat fields of district Rajouri (J&K). The study was based on extensive and intensive field surveys made during November 2009 to April 2011. During the course of fields study the authors have selected 6 important agrarian blocks of district Rajouri. i.e. Budhal, Darhal, Thanamandi, Kalakote, Nowshera and Sunderbani. Three sites were selected in each block for collection of weed species. During the study period the authors have reported a total of 104 weed species belonging to 02 monocot and 28 dicot families from the selected sites. Out of 30 weed families reported from 06 blocks of district Rajouri the predominance was shown by family Asteraceae having 25 weed species followed by family Fabaceae having 09 weed species. The maximum infestation was shown by weeds of monocot family Poaceae. i.e. *Avena fatua* and *Phalaris minor* in all the blocks.

**Keywords:** Families, Weeds, Wheat, Agrarian

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## **IMPACT OF SUPPLEMENTAL UV-B RADIATION ON CHLOROPHYLL DEVELOPMENT IN SOYBEAN (*GLYCINE MAX L.*)**

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**Abstract:** An attempt has been made to study the impact of supplemental UV-B radiation on chlorophyll content in soybean (*Glycine max L.*). Plants were irradiated daily with supplemental UV-B radiation supplied by sun lamps, 300 watt held in frames suspended 1 meter above the plants in the fields. The total supplemental UV-B irradiance received at the top of the plants beneath the lamps was 24.23 Jm<sup>-2</sup>s<sup>-1</sup>. Control plants were not exposed to supplemental UV-B radiation. Plants of plots T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> were exposed to supplemental UV-B radiation for 1 hr, 2 hr and 3 hr daily respectively till maturity. Result indicated that chlorophyll content was inhibited at all supplemental UV-B exposures during lab condition. Shorter exposure (1 hr) of supplemental UV-B radiation inhibited the chlorophyll pigment however longer exposures of supplemental UV-B radiation (2 and 3 hr) promoted the chlorophyll pigment during crop growth in field condition. Chlorophyll 'a' seems to be more sensitive to supplemental UV-B radiation. There was a gradual increase in chlorophyll content as crop grows towards maturity.

**Keywords:** Chlorophyll content, Soybean, Supplemental UV-B radiation

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## **HETEROISIS FOR YIELD COMPONENTS AND FRUIT CHARACTERS IN BRINJAL (*SOLANUM MELONGENA L.*)**

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**Abstract:** Heterosis for yield components and fruit characters was studied using Line x Tester analysis between twelve parents consisted of nine lines (local genotypes of Chhattisgarh) viz., IGB 35, IGB 43, IGB 44, IGB 52, IGB 54, IGB 55, IGB 65, IC 31, IC35 and three testers (improved varieties) viz., DBR 8, KS 224 and JBR 03 16 and a commercial check, PH-6. A high degree of heterosis was observed for all the characters studied. High level of heterosis for fruit yield per plant was shown by the hybrids, IGB-44 x JBR-03-16 (41.19%) followed by IGB-65 x KS-224 (39.79%), IC-31 x JBR-03-16 (25.21%), IC-31 x JBR-03-16 (25.21%) and IGB-55 x JBR-03-16 (24.43%).

**Keywords:** Brinjal, Heterobeltiosis, Relative heterosis, Yield

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## **EFFECT OF BENEFICIAL BIOINOCULANTS ON THE GROWTH OF MONKEY POD TREE (*SAMANEASAMAN*) IN NURSERY CONDITION**

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**Abstract :** Nursery experiments were conducted to assess suitable bioinoculants and their combinations to improve the seedling quality of *Samaneasaman*. Seeds were germinated in polythene bag with a potting mixture of unsterilized soil, sand and Farm yard manure in the ratio of 1:2:1 and inoculated individually and in combinations with *Azospirillum*, AM fungi and *Pseudomonas*. Shoot and root length, basal diameter and biomass were recorded at six months after inoculation. Results showed that the bioinoculants increase the growth and biomass of *S.saman* seedlings. Bioinoculants caused the significant increase in the growth, biomass, chlorophyll, protein and soluble sugar content of *S.saman* when compared to control plants. The maximum total biomass was observed in *Azospirillum* + AM fungi + *Pseudomonas* inoculated seedlings, followed by seedlings inoculated with *Azospirillum* + AM fungi and then by *Azospirillum* alone.

**Key words:** Biomass, Bio-inoculants, Biochemical content and *Samaneasaman*

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## **EFFECT OF NITROGEN AND PHOSPHORUS ON YIELD ATTRIBUTING AND YIELD OF DILL (*ANETHUM SOWA ROXB*)**

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**Abstract:** A 2-year experiment was conducted to find out the effect of nitrogen and phosphorus on growth and seed yield of Dill (*Anethum sowa* Roxb). The crop planted during rabi 2006-07 and 2007-08. The nitrogen application upto 90 kg ha<sup>-1</sup> significantly increased the number of umbels per plant, seeds per umbel, seed yield, straw yield and biological yield, net returns and B:C ratio. Whereas, branches per plant increased significantly upto 60 kg N ha<sup>-1</sup>. Significantly higher seed yield (1239 kg ha<sup>-1</sup>), net returns (Rs.27890 ha<sup>-1</sup>) and B:C ratio (3.24) was recorded with 90 kg N while, significant increase in yield attributes like number of umbels per plant, seeds per umbel, seed yield, straw yield, biological yield, net returns and B:C ratio of dill was observed upto 40 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>. Whereas, branches per plant, test weight, harvest index, significantly increased upto 20 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>. Significantly higher seed yield (1163 kg ha<sup>-1</sup>), net returns (Rs. 25507 ha<sup>-1</sup>) and B:C ratio (3.05) were recorded with 40 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>. Interaction effect of 90kg N with 40kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> were found significant higher for umbels per plant and seed yield.

**Keywords:** Dill, Nitrogen, Phosphorus, Economics

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## **VARIATION FOR MAJOR PLANT NUTRIENT UPTAKE IN A SET OF WHEAT LINES AND THEIR CROSSES**

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**Abstract :** An experiment was conducted in RBD design with three replications for study the variation for major plant nutrient uptake in a set of wheat lines and their crosses. The significant mean squares found for most of the nutrient content traits. The crosses were found superior in comparison to parents in relation to nutrient contents and the ranges of various nutrients were wider in crosses as comparison to parents. The association of N content (grain content) in testers as well as lines showed significant negative association with grain yield. In testers, the associations of N content in straw showed positive association with grain yield. Similarly N content in straw also exhibited strong association with P and K contents in both straw as well as grain in lines as well as in testers. In the lines however, the association of N content in grain with P in grain and K in straw were only found significant. The interrelationships among the nutrient traits in the crosses for these traits were however found non significant. In testers, the N content showed positive associations with p and K content in both straw as well as grain. In the lines however, the association of N content in grain with P in grain and K in straw were only found significant. The genotypes viz., UP-2338 followed by HD-2687 and Job 673 observed as nutrient efficient genotypes and they were also high yielder's. Thus this study indicates that it is possible to select genotypes which are high yielding as well as requires less applied fertilizers.

**Keywords:** Crosses, Correlation, Genotype, Nutrient index, Variability

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## **EFFICIENCY OF INTEGRATED USE OF ACIDULATED ROCK PHOSPHATE (PROM), FYM AND BIO-FERTILIZER ON GROWTH AND YIELD OF FENUGREEK (*TRIGONELLA FOENUM-GRACEUM* L.) AND AVAILABILITY OF PHOSPHORUS**

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**Abstract :** A field experiment was conducted during *rabi* season of year 2002-03 to find out the effects different source of phosphorus and integrated use of PROM (phosphorus rich organic matter) @ 75, 100 and 125 % of recommended dose of phosphorus, i.e., 30, 40 and 50 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> along with inoculation of PSB + *Rhizobium*, FYM @ 2, 4 and 6 t ha<sup>-1</sup> applied only with 75% PROM, i.e., 30 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup>, 40 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> through DAP and SSP on growth character (plant height, dry matter accumulation, number and weights of nodules), yield parameters of Fenugreek and availability of phosphorus in soil after post harvest analysis of soil. The application of P<sub>2</sub>O<sub>5</sub> up to 50 kg ha<sup>-1</sup> through PROM @ 125% + PSB + *Rhizobium* with recommended dose of significantly increased plant growth character, yield and available phosphorus after harvesting of Fenugreek but it was at par with PROM @ 100% P<sub>2</sub>O<sub>5</sub> of recommended dose + PSB + *Rhizobium*, PROM @ 75% P<sub>2</sub>O<sub>5</sub> of recommended dose + FYM @ 6 t ha<sup>-1</sup>, recommended dose of P through DAP and recommended dose of P through SSP as compared to remaining treatments.

**Keyword:** Fenugreek, Acidulated rock phosphate, FYM, Bio-fertilizer, Growth, Yield, Available phosphorus

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### **IN VITRO EVALUATION OF LEAF EXTRACT OF SOME PLANTS AGAINST PATHOGENIC FUNGI OF *IMPATIENS BALSAMINA* L.**

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**Abstract:** Leaf extracts of eight plants (*Azadirachta indica*, *Aegle marmelos*, *Bougainvillea spectabilis*, *Catharanthus roseus*, *Datura stramonium*, *Lantana camara*, *Ocimum sanctum* and *Parthenium hysterophorus*) were evaluated for their fungitoxic activity against *Alternaria alternata* and *Colletotrichum capsici* isolated from the leaves of *Impatiens balsamina* L. by using surface sterilization method. Poisoned food technique was used to study the *in vitro* effect of leaf extracts (10% conc.). Maximum inhibition of radial mycelial growth of *Alternaria alternata* and *Colletotrichum capsici* were observed by the leaf extract of *Aegle marmelos* (60.59% and 54.59% respectively). Leaf extracts of *Azadirachta indica*, *Lantana camara* and *Parthenium hysterophorus* also showed considerable amount of inhibition.

**Keywords:** Leaf extract, Pathogenic fungi, *Impatiens balsamina*

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### **ASSESSMENT OF BENEFICIAL MICROORGANISMS IN THE RHIZOSPHERE SOIL OF BLACK NIGHTSHADE (*SOLANUM NIGRUM* L.) IN NATURAL VEGETATION IN SEMIARID ZONE OF TAMILNADU**

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**Abstract :** *Solanum nigrum* (L.) is commonly called as Black Nightshade and it belongs to the family solanaceae. The sustainable cultivation techniques using bioinoculants not only improve the production but also maintain the soil fertility status and protect the agro ecosystem from degradation. Various types of beneficial microorganisms inhabited in the rhizosphere, which influence either directly or indirectly the growth and development of plants. Hence, Plant specific micro flora in the rhizosphere to be identify for the large scale application of bio inoculants for sustainable cultivation of *Solanum nigrum*. The present investigation focuses on the microbial interaction and rhizosphere ecology of existing wild plant of *Solanum nigrum* in semi-arid zone of Southern Tamil Nadu. The rhizosphere soil analysis showed the AM fungal spore (67/ 100 g soil) was recorded and *Glomus* as the dominant genus of AM fungi was found and 87% of AM fungal root colonization was also recorded in plants grown in sandy clay soil with a pH of 8.6. Among the fungi, the six dominant fungal species isolated and identified were *Aspergillus* sp., *Penicillium* sp., *Fusarium* sp., *Rhizopus*., *Trichoderma* sp., and *Curvularia* sp. *Solanum nigrum* are highly mycorrhizal dependent in this agro climatic region. Beneficial bacteria such as *Azospirillum*, *Pseudomonas* and *Azotobacter* were recorded. The above microorganisms may play a role in nutrient management and act as bio control for sustainable cultivation of *Solanum nigrum*.

**Keywords:** Bio-fertilizer, Rhizosphere flora, *Solanum nigrum*

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### **GRASSES OF DISTRICT SIDDHARTHANAGAR (U.P.)**

**Meenu Singh and A.K. Gupta**

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**Abstract :** The present investigation recorded 63 species belonging to 35 genera of Cyperaceae and Poaceae from the District Siddharthnagar, Uttar Pradesh.

**Keyword :** Grasses, Siddharthnagar, Uttar Pradesh

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## **EFFECT OF DIFFERENT TEMPERATURE AND GROWTH STAGES OF BLUE OYSTER MUSHROOM ON THE ACTIVITY OF ENZYMES\***

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**Abstract :** The experiment on effect of different temperature and growth stages of blue oyster mushroom on the activity of enzymes was conducted under laboratory conditions at Department of Plant Pathology, Rajasthan College of Agriculture, Udaipur (Rajasthan) during 2007-08. The activities of different enzymes such as cellulolytic and pectinolytic were determined in terms of loss in viscosity. The cellulase (Cx) and polygalacturonase transeliminase (PGTE) were detected in high quantity at 10 days (substrate colonization stage) after inoculation while polygalacturonase (PG) was maximum at 20 days (primordia initiation stage) and polymethyl galacturonase (PMG) and pectin transeliminase (PTE) were maximum at 30 days (young stage) after inoculation. Effect of temperature on the production of different enzymes such as cellulase, polygalacturonase, polymethyl galacturonase, pectin transeliminase and polygalacturonase transeliminase at different growth stages, temperature of 25°C was found better as compared to 20, 30 and 35°C temperature.

**Keywords:** Blue oyster mushroom, Enzymes, Growth stages, Temperature.

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## **EFFECT OF LAND CONFIGURATIONS AND MULCHES ON GROWTH, YIELD AND SOIL MOISTURE CONSERVATION IN KHARIF SORGHUM [*SORGHUM BICOLOR* (L.) MOENCH]**

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**Abstract:** A field experiment during *Kharif* season 2008-09 at College of Agriculture All India Coordinated Sorghum Improvement Project, College of Agriculture, Indore on medium black soil. A total of 15 treatment combinations consisted with three land configuration systems i.e. flat system, ridge and furrow system and flat system followed by earthing at 30 DAS and five treatments of mulches i.e. No mulch, wheat straw, FYM, green weed biomass and glyricidia leaves, replicated 3 times, were arranged in split plot design. Among land configuration systems, ridge and furrow system showed promising effect on growth parameters, yields, returns, B: C ratio and soil moisture conservation, followed by flat system earthing at 30 DAS over flat system. Among the mulches, application of glyricidia leaves followed by green weed biomass @ 6 t/ha applied at 35 DAS was significantly increased the growth, yields, returns, B:C ratio and soil moisture conservation.

**Keywords:** Mulches, Land configuration systems, Sorghum

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## **PERFORMANCE AND WATER USE EFFICIENCY OF TRANSPLANTED RICE (*ORYZA SATIVA* L.) AS AFFECTED BY MOISTURE REGIMES & INTEGRATED NUTRIENT SUPPLY SYSTEMS**

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**Abstract:** A field experiment was conducted at the Agronomy Research Farm, Narendra Deva University of Agriculture & Technology, Narendra Nagar (Kumarganj) Faizabad (U.P.) during *Kharif* season 2007-08. The experiment was laid out in split plot design with 4 replications comprising (3) three levels of moisture regime (7 cm irrigation 1, 3 and 5 DADPW) and 4 nutrient supply system (100 % NPK, 75 % NPK + 25 % N through FYM, 75% NPK + 25% N through biocompost and green manuring + 75% NPK). The soil of experimental plots was silty loam in texture with low available N, P and high K. The results indicated that 7 cm irrigation 1 DADPW was found significantly superior over 7 cm irrigation at 3 and 5 DADPW in respect to growth characters, viz., plant height, dry matter, LAI, number of shoots per hill, yield and its attributes. Nutrient management practices had also significant effect on growth parameters as well as yield and yield attributing characters. Application of recommended dose of NPK (120:60:40 kg ha<sup>-1</sup>) through chemical fertilizers found superior over rest of the nutrient management practices, which was closely followed by green manuring supplemented with 75% recommended NPK, but significantly superior over rest of the integrated nutrient supply systems. Highest grain and straw yield was obtained under 100% NPK through chemical fertilizers which was significantly superior over FYM and

biocompost + 75 % recommended NPK. The maximum water use efficiency was computed with 7 cm irrigation 1 DADPW, F<sub>4</sub> (green manuring + 75% NPK) nutrient supply system.

**Keywords:** Transplanted rice, Organic manure, IPNS, Nutrient uptake, Moisture regime, Yield

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## **EFFECT OF GROWTH AND NODULATION PATTERN OF URDBEAN (*PHASEOLUS MUNGO* L.) VARIETIES UNDER DIFFERENT AGRO-INPUT MANAGEMENT PRACTICES IN *VERTISOL***

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**Abstract:** A field experiment was carried out at Raipur during *kharif* season of 2010. Urdbean (*Phaseolus mungo* L.) variety Azad-1 recorded significantly highest plant height, number of branches plant<sup>-1</sup>, root length and dry biomass, dry matter accumulation, number and dry weight of nodules, number of flowers, number of pods plant<sup>-1</sup> and pod setting index, grain and stover yield. As regards to different agro-input management practices, application of 100% RDF + FYM 5 t ha<sup>-1</sup> + NAA 40 ppm + PSB + DAP 2% recorded significantly highest plant height, number of branches plant<sup>-1</sup>, root length and dry biomass, dry matter accumulation, number and dry weight of nodules, number of flowers, number of pods plant<sup>-1</sup> and pod setting index, grain and stover yield.

**Keywords:** Urdbean, Growth, Nodulation, NAA, PSB, DAP

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### **Short communication**

## **BIOEFFICACY OF INSECTICIDES AGAINST CATERPILLAR PESTS ON SOYBEAN CROP. Harish Kumar Netam and Shivam Soni**

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**Abstract :** A Field experiment will be laid out in randomized block design with six treatments including untreated control replicated four times. This crop will be sown on 4<sup>th</sup> July 2010 in plot size of 25 square meters. In this experiment numbers of caterpillars will be counted in randomly selected three one meter rows in each plot. Observations will be taken 24 hours before the spraying of insecticides and after 24 hours, 3 days, 7 days, 10 days of spraying of insecticides. Flubendiamide 480 SC was evaluated for bio-efficacy against lepidopteran pests, *S. litura* and *C. acuta*. Flubendiamide 480 SC when applied at the rate of 90 g. a.i./ha was most effective with minimum 1.62 larvae/m row and maximum grain yield of 25.47 q/ha. It was followed by the same insecticide applied @ 72 g.a.i./ha and Triazophos 40 EC with 3.00 and 3.06 larvae per meter row and 23.57 and 21.54 q/ha grain yield. Flubendiamide 480 SC@ 90 g.a.i/ha despite being most effective against the lepidopterous pests was also most economical with 34.82 percent avoidable losses and 1.53:1 benefit cost ratio. **Keywords :** Bioefficacy, Flubendiamide , *S. litura* , *C. acuta*, Soybean Lepidopteran pests, Triazophos

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### **Short communication**

## **THE FREE TREE OF INDIA: TOWARDS INCREASING GLOBAL INTEREST**

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**Abstract:** *Azadirachtaindica* is a tree in the family Meliaceae and is native to India, Pakistan and Bangladesh growing in tropical and sub-tropical regions. Neem is called The Free Tree of India and also known as the Village Pharmacy because of its healing versatility. One of the best promising of all plants and the reason is that it may gradually benefit every person on this planet. Probably no other plant yields as many strange and diverse products. With the banning of broad-spectrum, toxic insecticides, such as DDT, the use of neem in crop protection has been increasing. It has lot of importance in social forestry, agro-forestry and rehabilitating waste and degraded lands. On the contrary, India has a very high resources of neem wealth with millions of trees scattered throughout the country but we are yet to start neem research systematically except some sporadic research is being carried out in several laboratories.

**Keywords:** Neem, Medicinal products, Pesticides, Fertilizers

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**BIOEFFICACY OF INSECTICIDES AGAINST GIRDLE BEETLE ON SOYBEAN CROP.**

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**Abstract :** A Field experiment will be laid out in randomized block design with seven treatments including untreated control replicated four times. This crop will be sown on 3<sup>rd</sup> July 2010 in plot size of 25 square meters. In this experiment number of girdle beetle infested plants will be counted in randomly selected three one meter rows in each plot. Observations will be taken 24 hours before the spraying of insecticides and after 10 days and 15 days of spraying of insecticides.

Solomon 300 OD, a compound insecticide comprising Imidacloprid and Batacyfluthrin when applied at the rate of 350 ml/ha, was most effective against the girdle beetle with minimum 3.8 damaged plants/ meter row and highest grain yield of 27.3 q/ha. It was most economical with 1.75:1 benefit cost ratio and 42.49 per cent avoidable losses. It was followed by Triazophos 40 EC @ 625 ml/ha.

**Keywords :** Bioefficacy, Solomon , Girdle beetle, Soybean, Imidacloprid, Triazophos

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**Short communication**

**NUTRITIONAL COMPOSITION AND CELLULOSE DEGRADING ABILITY OF *HYPsizYGUS ULMARIUS*.**

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**Abstract:** Fruit bodies of *Hypsizygus ulmarius* (Bull.) Redhead contains 23.01 per cent protein, 52.50 per cent carbohydrate (dry weigh basis). Moreover, it also contains 12.20 per cent crude fiber and 22.05 per cent ash. The total moisture content was 89.68 per cent (fresh weight basis). The analysis reveals that the fruit bodies were quite rich in trace elements content viz. copper 33.8 ppm, iron 70.55 ppm and manganese 30.00 ppm. *Hypsizygus ulmarius* possessed higher cellulose degrading ability and produced more mycelium as compared to control.

**Keywords:** *Hypsizygus ulmarius*, protein, carbohydrate, crude fiber, cellulose degrading ability