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## ASSESSMENT OF CARBON STOCK AND FUTURE POTENTIAL OF CARBON SEQUESTRATION OF SOOR SAROVAR BIRD SANCTUARY, KEETHM-UP

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**Abstract:** Soor Sarovar Bird Sanctuary is a small human-made forest with a lake on the outskirts of Agra, India. The study estimates terrestrial and aquatic carbon. The total carbon stocks estimated at 1.31 million tons bears a social cost of carbon value of ₹21 million. The aquatic carbon stock density was found to be significantly higher than the terrestrial stocks. The study outcomes are usable for maximising ecosystem services in the broader context of sustainability. The research method estimating carbon stocks is relevant to national policies and applicable to similar forests. An optimistic scenario suggests that the sanctuary area by 2030 can sequester per unit area carbon which is 12 times the target of achieving our ambitious target. An established theoretical and empirical correlation of increased carbon stocks with biodiversity and other ecosystem services are suggestive of such small urban peripheral sanctuaries playing a critical role in mitigating the climate change.

**Keywords:** Soor Sarovar Bird Sanctuary, Aquatic carbon, Terrestrial carbon, Carbon stocks, Anthropogenic

## PRECLINICAL STUDY OF HEALING EFFECT OF METHANOLIC EXTRACT OF *CORIANDRUM SATIVUM* IN WOUNDS OF AN ANIMAL MODEL OF DIABETES

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**Abstract:** People with Diabetes Mellitus often use medicinal plants to treat this metabolic disease that frequently reports complications, such as impaired wound healing. *Coriandrum sativum* has a wide range of healing properties: antibiotics, antifungals, hypoglycemics and antioxidants to name a few. However, no studies have been conducted on its potential as a wound healing agent. So, the objective of this work was to determine the wound healing effect of the methanolic extract of *C. sativum* seeds in reducing the closing time of surgical lesions in *Long Evans black* rats induced to a diabetes model with alloxane. Material and methods: Toxicity tests were performed using the *Artemia salina* model and phytochemical test were conducted to determine the composition of the extract. The Diabetes model was induced with alloxane and wound was done

with a biopsy punch. During the experiment, 6 groups of 5 rats each were included and the diameter of the wound was measured at days 0, 7, 14 and 21. At the end of the observation period, the animals were sacrificed and histological analysis of the wound skin was performed. Results: The alloxane treated group (diabetes model) had delayed wound healing. The group treated with the extract at a concentration of 2000 µg/mL presented wound closure on day 16 and histological characteristics similar to normal tissue of the control group. Conclusions: *C. sativum* methanolic extract accelerated wound healing, which was confirmed by histological analysis.

**Keywords:** Diabetes Mellitus, Coriandrum sativum, Scarring effect, Hyperglycemia, Healing effect, Wound healing

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## SEED GERMINATION BEHAVIOUR OF *CANNABIS SATIVA* L. UNDER DIFFERENT TEMPERATURE REGIMES

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**Abstract:** *Cannabis sativa* L. (Cannabaceae) is one of the earliest cultivated plant, containing many of the valuable natural components useful for health as well as livelihood. Cultivation of *Cannabis* is done by sowing its seeds in the field provided with favourable physical and chemical parameters for germination. In this study, optimum temperature and time required for germination of *Cannabis* seeds collected from Kausani, Uttarakhand have been studied at various temperatures under the controlled laboratory conditions. The percentage of germination, germination energy and seedling vigor index I and II was reported maximum at a constant temperature of '25°C' with having 3<sup>rd</sup>-4<sup>th</sup> and 6<sup>th</sup> day as its first and final count day, respectively. Therefore, it is suggested to the researchers/cultivators to raise the nursery of *Cannabis sativa* L. seed at '25°C' to achieve healthy and maximum seedlings of the crop.

**Keywords:** Hemp, THC, CBD, Germination potential, Seedling vigor

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## PERFORMANCE OF INTERCROPS IN HYBRID MAIZE UNDER NORTH CENTRAL PLATEAU ZONE OF ODISHA

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**Abstract:** An experiment was conducted at Field Experimental Block, Regional Research and Technology Transfer Station, Keonjhar, during *Kharif* season for two consecutive years of 2017 and 2018 under RKVY project to study the performance of maize based intercropping system under North Central Plateau Zone of Odisha. The experiment was laid out in RBD design. The experiment comprised of thirteen treatments viz. T1- Maize + Cowpea (1:1), T2-Maize + Cowpea (2:2), T3-Maize + Radish (1:1), T4-Maize + Radish (2:2), T5-Maize + Cluster bean (1:1), T6-Maize + Cluster bean (2:2), T7-Maize + Arhar (1:1), T8-Maize + Arhar (2:2), T9-Maize (sole), T10-Cowpea (sole), T11-Radish (sole), T12- Cluster bean (sole), T13-Arhar (sole). The varieties taken were: Maize-Pioneer 3396(Hybrid), Cowpea-Kasi Kanchan, Cluster bean -Pusa Navbahar,

Arhar- Corg 9701 and Radish- Pusa Chetki Long. Results revealed that Maize + cowpea (1:1) proved to be the most profitable system being at par with maize + cowpea (2:2) & maize + radish (1:1 & 2:2) systems in both the years. However, maize + arhar (1:1) returned the highest amount per rupee invested (1.78) among all the systems when number of days occupied in the field is not taken into account. Therefore for North Central Plateau Zone of Odisha cowpea and radish are the most suitable intercropping with maize in Kharif season in the above row ratios.

**Keywords:** Kharif, Intercropping, Maize, Cowpea, Profitable

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## EFFECT OF INTEGRATED NUTRIENT MANAGEMENT ON GROWTH AND DEVELOPMENT OF MUSTARD (*BRASSICA JUNCEA* L.) IN IRRIGATED CONDITION OF UPPER GANGETIC PLAINS

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**Abstract:** A field experiment was conducted to study the effect of integrated nutrient management on growth and development of mustard (*Brassica Juncea* L.) under timely sown irrigated conditions on sandy loam soil at Students' Instructional Farm (SIF) of C.S. Azad University of Agriculture and Technology, Kanpur. The experiment was laid out in Randomized Block Design replicated thrice. The treatments comprises of either 100% RDF (N:P:K:S) @ 120:60:40:40 kg ha<sup>-1</sup> or 75 % RDF @ 90:45:30:30 kg ha<sup>-1</sup> or 50 % RDF @ 60:30:20:20 kg ha<sup>-1</sup> along with combinations of vermicompost @ 1.25 t ha<sup>-1</sup> or 0.62 t ha<sup>-1</sup>, FYM @ 5 t ha<sup>-1</sup> or 2.5 t ha<sup>-1</sup> with bio-fertilizers (azotobacter + PSB) @ 7.5 Kg ha<sup>-1</sup> + ZnSO<sub>4</sub> @ 10 Kg ha<sup>-1</sup>. The results of the present investigation revealed that the growth and yield traits viz., plant height at maturity (201.41cm), number of branches at maturity (7.59 primary, 9.37 secondary and 3.97 tertiary branches), LAI at 90 DAS (4.46), dry matter accumulated at maturity (44.23 g/plant) and grains yield (23.25 q ha<sup>-1</sup>) were recorded significantly highest with application of 50% RDF + FYM @ 2.5 t ha<sup>-1</sup> + vermicompost @ 0.62 t ha<sup>-1</sup> + bio-fertilizers @ 7.5 kg ha<sup>-1</sup> + ZnSO<sub>4</sub> @ 10 kg ha<sup>-1</sup>. Hence, it may be recommended for farmers for higher yield in the area of Upper Gangetic Plains.

**Keywords:** Development, Fertilizers, FYM, Growth, Mustard, Vermicompost

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## UTILIZATION POTENTIAL OF AGRICULTURAL INFORMATION SOURCES

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**Abstract:** We are now living in the age of information where accessing and utilizing appropriate information source play crucial role in determining the success of any human activity. Agriculture of today has also become very time-critical and information-intense. Hence, the utilization potential of any information source to cater to the information needs of the farmers in various aspects would determine its usefulness to the farming community. With this background, the present research work has been conducted in order to assess the utilization potential of the existing information sources in the study area and thereby identify the factors influencing the utilization potential of the information sources. In the present study, utilization potential of the information sources has been conceptualized as the predictor variable and the nineteen other attributes associated with the farmers has been considered as the predictor variables. The study has been carried out in three villages of Coochbehar-I and two villages of Coochbehar-II block of Coochbehar district in West Bengal. Purposive as well as multistage sampling and random sampling procedures were followed in selecting hundred numbers of respondents. The data were collected with the help of structured questionnaire through personal interview method. The major statistical tools like correlation co-efficient and multiple regression analysis were used to analyse the data. The important findings of the

study are that the timeliness of the information sources has positive association with the utilization potential whereas the usefulness of the multiple sources of agricultural information ultimately reduces the utilization potential of individual information source. Farmers have also admitted that the agricultural information sources available in the study area have medium level of potential to cater to their information needs. Therefore, there is a scope to further improvement of those information sources for effective and efficient dissemination of appropriate information for sustainable agricultural development.

**Keywords:** Information source, Information-intense, Utilization potential, Sustainable agricultural development

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## **PLANT GROWTH PROMOTING ACTIVITIES OF INDIGENOUS STRAINS OF *TRICHODERMA VIRIDE* AND *TRICHODERMA HARZIANUM* USED AS SEED TREATMENT IN GROUNDNUT**

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**Abstract:** Experiment was conducted *in vivo* to study the plant growth promoting activities of strains of *Trichoderma harzianum* and *Trichoderma viride* used as seed treatment@ 10 g /kg seed in groundnut. Various observations of growth parameters and yield components i.e. plant height (cm), no. of branches, no. of pods / plant, unfilled pods/ plant, filled pods/plant and pod yield/ plant (g) were recorded maximum in *Trichoderma strains* T2 respectively, followed by T3, T4 and minimum unfilled pod was recorded in strain T4(18) superior over control.

**Keywords:** Groundnut, *Trichoderma harzianum*, *Trichoderma viride* growth parameters, Yield components, Seed

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## **EVALUATION OF SOYBEAN CULTIVARS FOR RESISTANCE TO ALTERNARIA LEAF SPOT CAUSED BY *ALTERNARIA ALTERNATA***

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**Abstract:** The present study was undertaken to study Biology and Management of *Alternaria* leaf spot of soybean caused by *Alternaria alternata*, as the disease is quite destructive in all the soybean growing areas. The field experiment was conducted two consecutive years *Kharif* season 2018 and 2019 at Department of Plant Pathology, Rajasthan College of Agriculture, Udaipur. Ten cultivars of soybean were screened for these diseases under artificial inoculated field conditions and results revealed that 3 cultivars namely (JS-9305, JS-9752 and RVS 2002-04) exhibited moderately resistant (MR) reaction, while 5 cultivars viz. JS-2029, RKS-18, RKS-113, JS-9560 and RKS-45 exhibited moderately susceptible (MR) reaction. Rest of cultivars viz. RKS-24 and JS-335 showed susceptible (S) reaction.

**Keywords:** Alternaria leaf spot, Cultivars, Resistance, Soybean

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## **ETHNO MEDICINAL KNOWLEDGE OF SPICES AND THEIR USES BY TRIBAL COMMUNITY OF RAJASTHAN, INDIA**

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**Abstract:** A spice is a dried seed, fruit, root, bark or vegetative material used in nutritionally insignificant amount as a food supplement for the reason of flavouring and imparting taste. Spices are defined as "a strongly flavoured or aromatic substance of vegetable origin, obtained from tropical plants, commonly used as a condiment". In ancient times, spices were as valuable as metal gold; and as noteworthy as medicines and perfumes. No country in the world cultivates as a lot of kinds of spices as India with quality spices come from Kerala, an Indian state. Because of the varying climates in India-from tropical to sub-tropical, temperate-almost all spices are grown in this country. In almost all of the 28 states and seven union territories of India, at least one spice is grown in profusion. Spices used by tribe as herbal ethno medicine to treat several common diseases such as fever, indigestion, diarrhoea, dysentery, vomiting, asthma, heart diseases, headache, boils, leucoderma, bold disorders, piles and insect bites etc. were documented. High level of commercial use as ethno medicinal practices adversely affect the physical, social and economic welfare of the tribal community of Chittorgarh ,Rajasthan . A survey (December 2012 to December 2013) reported data on four-teen spices belonging to twelve families identified from this region. Brief information about the scientific names with family, common names (English), plant part used, way of application of plant parts and their uses against diseases have been presented. Present study reveals that some species are important in primary healthcare sys-tem of tribal communities. This paper deals with the biodiversity of spices and their ethno medicinal uses by the tribal communality for conservation and utilisation in Chittorgarh ,Rajasthan.

**Keywords:** Spices, Ethno medicinal uses, TSP (Tribal specific place) Antimicrobial activity

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## **EFFECT OF SOAKING AND PLACEMENT OF SEED ON GERMINATION AND SEEDLING EMERGENCE IN LITCHI**

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**Abstract:**An experiment was conducted at ICAR-NRC on Litchi, Muzaffarpur during 2018 to assess the effect of soaking of seed, orientation and depth of seed sowing on germination and seedling emergence in litchi. Result indicated that soaking of seed in water before sowing had improved seed germination in litchi. The maximum germination was found in GandakiLalima with 92.58% as compared to without soaking (62.75%).There was a significant reduction in seedling emergence with an increase in burial depth. Seeds sown at 1 cm depth showed the highest seedling emergence with an average percentage of 79.81.The highest seed germination was found in lay flat orientation when seeds were sown at the depth of 1 cm.Litchi seedlingemergence was greatest and most rapid when seeds were sown 1 cm deep and positioned flat, on their sides.

**Keywords:** Effect, Germination, Litchi, Seed

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## **PERFORMANCE OF PARENTS AND HYBRIDS FOR YIELD AND YIELD ATTRIBUTING TRAITS IN TOMATO (*SOLANUM LYCOPERSICUM L.*)**

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**Abstract:** A field experiment was conducted during *rabi* season 2017-18 in Randomized Block Design with three replications at Horticultural Research cum Instructional Farm, Department of Vegetable Science, IGKV, Raipur (C.G.). Six diverse and horticulturally superior lines of tomato were crossed with four testers in line x tester mating design. The resultant 24 hybrids ( $F_1$ 's) along with their parents (six lines and four testers) were evaluated for eighteen yield and yield attributing traits in tomato. The experiment results revealed that parents 2014/TOLCVRES-3 performed best for characters *viz.*, number of flowers per cluster (6.38), number of fruits per cluster (4.84), pericarp thickness (mm) 6.18 mm and total soluble solid ( $^{\circ}$ Brix) 4.49  $^{\circ}$ Brix. Fruit diameter (cm), average fruit wt. (g) and fruit length (cm) were observed in parents 2015/TOLCVRES-2 and 2015/TOLCVRES-4. Whereas fruit yield per plant (3.78 kg), days to first fruit harvest (70.99) and dry matter % of fruit (6.21%) recorded in parent H-86. Among all parents, H-86 and 2014/TOLCVRES-3 with the yield of 659.72 q/ha and 611.04 q/ha respectively were found to be better yielders. Among all hybrids PR X 14/TLCV-3, PC X 15/TLCV-2, KA X 15/TLCV-2, KA X 14/TLCV-3 and AV X 14/TLCV-1 were best performing in maximum number of quality and yield attributing traits like days to 50% flowering (27.00), maximum number of fruit cluster per plant (12.42), ascorbic acid (25.01 mg/100g), number of flowers per cluster (7.12), fruit diameter 7.00 cm, average fruit wt. (144.50 g), fruit yield per plant (3.52kg), total soluble solid (5.71  $^{\circ}$ Brix), and number of locules per fruit (5.24). Fruit yield per hectare was observed in the cross H-86 X 14/TLCV-3 (727.58 q), followed by KA X 14/TLCV-3 (724.13 q) and H-86 X 15/TLCV-4 (705.76 q). Therefore, recommended for generation advancement and selection of desirable progeny lines useful for Chhattisgarh plains.

**Keywords:** Tomato, Fruit yield, Genotypes, Parents, Hybrids