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STATUS OF PEARL MILLET RESEARCH IN INDIA

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Abstract: Pearl millet [*Pennisetum glaucum* (L.)R.Br.] is grown mainly as a rainfed crop in north and northwestern parts of country. These regions are highly prone to scanty and unevenly distributed rainfall and hence are always drought-prone. High temperature and low nutrient status of soils further exaggerate the deleterious effect of drought. The pearl millet growing regions are also most vulnerable to climate change as the frequency of drought is likely to increase. The purpose of this review is to explore and document pearl millet research efforts and important milestones in its improvement and to discuss their implications for future pearl millet improvement as a grain and forage crop for the drought- and heat-stressed areas, especially in India.

Keywords: AICPMIP, All India Coordinated Pearl Millet Improvement Program; CMS, Cytoplasmic male sterility; DArT, Diversity array technology; OPV, Open-pollinated variety

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PURIFICATION OF QUALITY DNA FROM CITRUS PLANT USING IRON OXIDE NANOPARTICLE AS SOLID BASED SUPPORT

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Abstract: Purification of quality DNA is one of the essential factors affecting the success of molecular genomic studies. No single existing nucleic acid extraction method is sufficient for quality yield of DNA from high polyphenol contaminated plant materials. Here, in this study we have synchronized CTAB based lysis method with magnet mediated DNA separation utilizing iron oxide nanoparticles. An inexpensive, rapid and simple protocol has been described for extracting high quality genomic DNA from citrus leaves. Purity of the extracted DNA was revealed by the ratios of absorbance at 260/280 nm to be close to 1.80. Isolated plant genomic DNA was directly analyzed for PCR amplification which indicate freedom from common contaminating compounds. Possibly, this description is reported for the first time for the isolation of DNA from mature citrus leaf employing unmodified iron oxide nanoparticle.

Keywords: Plant, DNA isolation, Magnetic Nanoparticle, Iron oxide, PCR

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IMPACT OF DIFFERENT AGRO-FORESTRY SYSTEMS ON GROWTH AND YIELD OF TURMERIC AT TARAI REGION OF UTTARAKHAND, INDIA

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Abstract: An experiment was carried out to evaluate the effect of different agroforestry system on turmeric with reference to vegetative growth, rhizome yield and its attributes of turmeric (*Curcuma longa* L.). Turmeric showed positive response to the agroforestry system as compared to open system. Turmeric with (T2) *Diospyrus embryophyllum* had the taller plant height, maximum number of leaves, maximum leaf area index (5.02), maximum curcumin per cent (4.12) and maximum curing per cent (27.41). Maximum number of tillers was showed by the turmeric grown under T9 (*Terminalia chebula*), fresh yield (22.20 t ha⁻¹) and cured yield (6.08 t ha⁻¹) of rhizome was obtained under open condition however, among the different agroforestry system it was higher under T9. Moreover, the soil parameters such as SOC (0.99%), available N (304.51 kg ha⁻¹), P (18.23 kg ha⁻¹) and K (161.52 kg ha⁻¹) were also highly influenced by the T9 (*Terminalia chebula*).

Keywords: Agroforestry, *Curcuma longa* L., Rhizome yield, Curcumin

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FAMERS' PERCEPTION OF THE CONSTRAINTS AFFECTING THEIR LIVELIHOOD STRATEGIES IN ADAMAWA STATE, NIGERIA

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Abstract: This study examines famers' perception of the constraints affecting their livelihood strategies in Adamawa State, Nigeria. The objective of the study was to examine the socio-economic characteristics of food crop famers and to analyze constraints that affect their livelihood strategies. A multistage random sampling technique was used to select 150 food crop farmers from 8 villages of four local government areas each from the four Agricultural Development Zone of the State. Structured questionnaire survey was used to obtained data from the respondents in the study area. Descriptive statistics and Garret Ranking Technique was used to analyze the data obtained from the field survey. The study shows that majority 68.7% were full time farmers with average mean of 47 years of age and 30 years of farming experience. Majority (85.3%) was male farmers and only 15.3% of the respondent had no formal education with average land holding of 3.4 hectares. The result from the Garret Ranking Technique reveals that the most severe problem in the study area in term of financial constraints is inadequate access to credit facilities, lack of good roads was ranked the highest as infrastructural constraints and poor land fertility as the most severe among other production constraints. The study recommended intensive efforts of research toward reclamation of land fertility for sustainable agriculture, provision of affordable credit facilities and infrastructural facilities among other suggestions in the study.

Keywords: Farmers' Perception, Constraints, Livelihood, Strategies, Adamawa, Nigeria

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POST EMERGENCE HERBICIDES EFFECT ON YIELD ATTRIBUTING CHARACTERS AND YIELD OF FINGER MILLET

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Abstract: Finger millet (*Eleusine indica*) is an important small millet crop that is hardy and grows well in dry zones as rain-fed crops. There were thirteen treatments which comprised single application of different post-emergence herbicides either alone or in combination and hand weeding was conducted on Clayey *Vertisols* soil of College of Agriculture, Raipur during *kharif* season of 2012. The highest number number of fingers m⁻², finger length, number of fingerlet finger⁻¹, number of grains finger⁻¹ and test weight was observed in hand weeding twice which. Hand weeding twice at 20 and 40 DAS proved significantly superior to all other treatments. Among different herbicidal weed management practices, ethoxysulfuron recorded the highest grain yield. Straw yield of finger millet was the highest under hand weeding twice which was at par with that of metsulfuron methyl + chlorimuron ethyl and Hand weeding twice gave higher harvest index. Hand weeding twice recorded the highest grain yield and net return. Application of ethoxysulfuron registered the highest B:C ratio which was at par with metsulfuron methyl + chlorimuron ethyl and hand weeding twice.

Keywords: Weed management, Finger millet, Herbicides, Poaceae

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STUDY ON EFFECTS OF WEED MANAGEMENT PRACTICES ON MONETARY ADVANTAGES AND QUALITY OF SESAME BASED INTERCROPPING WITH *KHARIF* SEASON CROPS

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Abstract: A field experiment was conducted during at SIF, C.S. Azad University of Agriculture & Technology, Kanpur-208002 (UP) during two *Kharif* seasons of 2015 and 2016. The experiment consisted 12 treatments having four intercropping viz, sesame + maize (4:1), sesame + maize (8:2), sesame + urd (4:1) and sesame + urd (8:2) and three weed management practices viz, Hand weeding, Pre-emergence of Pendimethaline 30% EC@3.0 L/ha and Early post-emergence of Alachlor 50% EC@ 0.75 kg/ha replicated four times. The experiment was laid out in Factorial Randomized Block Design. The main crop as Sesame of Shekhar variety and sub crops as Maize of P-3441 variety and urd of Shekhar-2 variety were used in the study year. The all weed flora were counted significantly lowest, in treatment of sesame + urd (8:2) intercropping composed to remaining intercropping treatment during both the years, respectively. The grain yield of sesame was significantly higher produced in sesame + urd (8:2) treatment over other rest treatment during 2015 and 2016 years, respectively. The grain yield of maize and urd intercrops with sesame in 8:2 row ratio was statistically higher produced than 4:1 row ratio during both the years except urd intercrop in second year only. The monetary benefits of main crop (sesame) was recorded significantly more with sesame + urd (8:2) intercropping over used rest intercropping during both the years, respectively. The intercropping of sesame + urd (8:2) were found significantly higher quality parameters viz., protein and oil content over sesame + maize (4:1), sesame + maize (8:2) and sesame + urd (4:1) intensively during both the years, respectively. The hand weeding practice was significantly reduced weed populations, over chemical weed management practices as pre-emergence of Pendimethaline and early post emergence of Alachlor, respectively during both years. The response of weed management practices was significantly noted in hand weeding practice in respect to grain yield of main crop (sesame) and sub crop (Maize and urd) over applied chemical weedicides as pendimethaline and Alachlor during both the years, respectively. The monetary advantages viz., system of productivity and profitability and quality aspects viz, protein and oil content with hand weeding practice were significantly more than applied both chemical control of pendimethaline and Alachlors in both the years, respectively. Therefore, inter cropping sesame + ured (8:2) with hard weeding practice may be recommended in respect to all weed populations reduced more produced grain yield of main and sub crop monetary advantages and quality aspects.

Keywords: Weed management, Crops, *Kharif*, Treatment

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HOLY BASIL CULTIVATION FOR DOUBLING THE FARMER'S INCOME IN SANDY LOAM SOILS

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Abstract: Effective use and management of cultivable land through cultivation of suitable medicinal and aromatic plants has become keen agenda. Tulsi has an important option for livelihoods and sustainability of farmers income in central Gujarat. Large scale Front Line Demonstration (FLD) was conducted in farmers field using tulsi accession "DOS-1". A total of 7.36 t h⁻¹ fresh leaves were harvested. On an average, farmers got ` 1, 28, 528 net returns per hectare from cultivation of tulsi as a sole crop. The B:C ratio over net return of 1.39 showed the suitability of tulsi as a commercial crop. The accession DOS-1 having higher leaf yield and found suitable for main as well as two ratoon crops. The results clearly gave an idea that

medicinal plant like tulsi can be integrated into existing farming systems as one of the viable options for enhancing income of poor farmers.

Keywords: *Ocimum sanctum*, Tulsi, DOS-1, Net return, Cost of cultivation, FLD

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UTILIZATION PATTERN OF KISAN CREDIT CARD AMONG THE SMALL AND MARGINAL FARMERS IN REWA BLOCK OF REWA DISTRICT (M.P.)

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Abstract: The Kisan Credit Card scheme introduced in the year 1998 with the objective of fulfillment of agriculture the credit requirement of the farmers in a timely and hassle-free manner for raising agricultural production. Keeping the importance of KCC the present study was an attempt to assess utility of KCC as perceived by the farmers. To gain insight into the functioning of KCCs, the present study entitled “Utilization pattern of Kisan Credit Card (KCC) among the small and marginal farmers in Rewa block of Rewa District (M.P.)” was carried out with a sample of 140 beneficiaries of Kisan Credit Card (70 small & 70 marginal farmers). It may be concluded that among the selected indicators the mean utilization index of the indicator increase in income through Kisan Credit Card (70%) was highest. Kisan Credit Card was highly utilized in increasing of agriculture and allied activities and in changing cropping pattern. On the contrary utilization of Kisan Credit Card was low in amount utilized as credit increase in extent saving and duration of utilizing credit. It was also observed that the higher percentage of the small and marginal farmers belonged to medium utilization of Kisan Credit Card. As far as the relationship between profile of the respondents with their utilization pattern of Kisan Credit Card is concerned the characteristics namely education, occupation, credit acquisition, annual income, repayment of loan, contact with credit agency, source of information, mass media exposure, risk orientation, economic motivation and level of satisfaction had significant relationship with their utilization pattern of Kisan Credit Card at 5% level of significance.

Keywords: Farmers, Credit card, Utilization, Rewa district

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CORRELATION AND PATH COEFFICIENT ANALYSIS IN CHILLI (*CAPSICUM ANNUM L.*) FOR FRUIT YIELD AND ITS ATTRIBUTING TRAITS

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Abstract: The present investigation is carried out to study the correlation and path analysis for fruit yield and its attributing traits in 18 genotypes of chilli. Correlation and path coefficient analyses have been successfully used for plant selection for increasing yields of different crops. Association analysis studies indicated that fruit yield plant⁻¹ had significant positive correlation with fruiting span, number of fruit plant⁻¹, fruit length indicating that these characters are the primary yield determinant in Chilli. To measure the direct as well as indirect association of one variable through another on the end product, path coefficients were calculated for all the yield attributing traits. Path coefficient analysis revealed that plant height at 150 DAT, number of branches plant⁻¹, days to first flowering, days to 50% flowering, days to first picking, fruiting span, number of fruit plant⁻¹, fruit length, fruit width, average fruit weight were the most important characters contributing towards fruit yield plant⁻¹ and hence purposeful and balanced selection based on these characters would be made rewarding for improvement of chilli.

Keywords: Chilli, Correlation, Path coefficient analysis, Fruit

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**TO STUDY THE EFFECT OF NITROGEN ON GROWTH OF OAT
(AVENA SATIVA L.)**

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Abstract: Agriculture and Animal husbandry is complementary enterprises and it plays a vital role in Indian economy. All India summary reports of the 17th livestock census released in July 2006 points out that India possesses the largest livestock populations in the world after Brazil. It accounts for about 56 per cent of the world's buffalo population and 14 per cent of the cattle population. It ranks first in respect of buffalo and second in respect of cattle population, second in goat population and third in respect of sheep in the world. Animal husbandry output constitutes about 30 per cent of the country's agriculture output (*Indian Economy, 2007, pp. 23*).

Keywords: Nitrogen, Oat, Population, Fertilizer, Crop