

ABSTRACTS

Volume - II

International Conference on Advances in Agriculture & Food System Towards Sustainable Development Goals

August 22 - 24th, 2022

University of Agricultural Sciences, Bangalore

Jointly organized by



University of
Agricultural Sciences,
Bangalore



All India Agricultural
Students Association
New Delhi



Indian Council of
Agricultural Research
New Delhi

Supported by



© Publisher

Address

University of Agricultural Sciences, Bangalore

E-mail: doe@uasbangalore.edu.in

Website: <https://uasbangalore.edu.in>

Editorial Team

S. Rajendra Prasad

K.C. Narayanaswamy

Basave Gowda

K.H. Nagaraj

S. Chandrashekar

Manjunath Gowda

K. Murali Mohan

M.T. Sanjay

M. Manjuantha

M.N. Thimmegowda

K.N. Srinivasappa

O.R. Nataraju

K.S. Jagadish

M. Gaddigangappa

Ashish Khandelwal

G. Karthikeyan

Vivek Saurabh

Maruthi Prasad B. P.

Correct citation: Prasad, S. R., Narayanaswamy, K.C., Gowda, B., Nagaraj, K.H., Gowda, M., Mohan, K.M, Sanjay, M.T., Manjuantha, M., Thimmegowda, M.N., Srinivasappa, K.N., Nataraju, O.R., Jagadish, K.S., Gaddigangappa, M., Khandelwal, A., Karthikeyan, G., Saurabh, V., Prasad, M.B.P. (Eds.). 2023: Abstracts Vol II, Published by the University of Agricultural Sciences, Bangalore, India pp 55.

ABSTRACTS

Volume II

Published by:

University of Agricultural Sciences, Bangalore

E-mail: doe@uasbangalore.edu.in

Website: <https://uasbangalore.edu.in>

Printed by

G.C. Enterprises, M-117, M-Block, Naveen Shahdara, Delhi-110032; Mob.: +91-8587859553;

Email: gcenterprises2020@gmail.com

LIST OF ABSTRACTS

Title of the Abstract	Page No.
AN ANALYTICAL STUDY ON ROLE OF TRIBAL WOMEN IN CROP BASED LIVELIHOOD ACTIVITIES IN SOUTHERN RAJASTHAN	1
GENOME-WIDE LINKAGE MAPPING OF QTL/S FOR YIELD ASSOCIATED TRAITS UNDER DIFFERENT WATER REGIMES IN WHEAT	2
UPSCALING THE MINOR MILLET CULTIVATION FOR LIVELIHOOD IMPROVEMENT AND SUSTAINABLE INCOME FOR THE UNDERPRIVILEGED FARMING COMMUNITY	3
CROP DIVERSIFICATION IN DIFFERENT AGROCLIMATIC ZONES OF KARNATAKA	4
NEED OF CROP DIVERSIFICATION FOR DOUBLING FARMER'S INCOME IN BUNDELKHAND REGION OF CENTRAL INDIA - A SUCCESS STORY	5
TRAIT ASSOCIATION AND PATH-COEFFICIENT STUDIES IN SEGREGATING GENERATIONS OF BLACKGRAM (VIGNA MUNGO L. HEPPER)	6
SUSTAINABILITY OF COMMODITY BASED ASSOCIATIONS IN SOUTHERN KARNATAKA OF INDIA	7
APPLICATION OF ARTIFICIAL INTELLIGENCE IN PLANT DISEASE DIAGNOSIS	8
A SAFETY ALARM SYSTEM FOR INJURY PREVENTION IN FODDER CUTTER MACHINEROLE OF GEO - SPATIAL TECHNOLOGY IN LAND DEGRADATION ASSESSMENT IN BALLIA DISTRICT OF UTTAR PRADESH, INDIA	9
INFLUENCES OF REPLACING DIETARY FISH MEAL BY SILKWORM PUPAE MEAL ON GROWTH PERFORMANCE, NUTRIENT UTILIZATION AND WHOLE-BODY PROXIMATE COMPOSITION OF PACIFIC WHITE SHRIMP (PENAEUS VANNAMEI)	10
CLIMATIC CHANGE AND RAINFALL MODELLING - A CASE STUDY OF ALAPPUZHA, KERALA	11
SCIENTIFIC AND MANAGERIAL INNOVATIONS FOR PROMOTING	12
CLIMATE SMART AGRICULTURE	13
CLIMATE RESILIENT AGRICULTURE	14
CLIMATE CHANGE AND ITS IMPACT CROP WATER REQUIREMENT OF MULBERRY (MORUS SPP., MORACEAE) CROP IN YADGIR DISTRICT, KARNATAKA, INDIA	15
FORMULATION AND EVALUATION OF THE PHYSICO-CHEMICAL QUALITY OF ANTI-DIABETIC POLYHERBAL FORMULATIONS	16
RECENT TRENDS IN PECTIN EXTRACTION FROM APPLE POMACE	17
DEVELOPMENT AND NUTRITIONAL EVALUATION OF DRAGON FRUIT PEEL AND CARROT POMACE INCORPORATED COOKIES	18

Title of the Abstract	Page No.
EXTRACTION OF LOW METHOXYL PECTIN FROM JACKFRUIT: ULTRASONICATION ASSISTED EXTRACTION USING RESPONSE SURFACE METHODOLOGY	19
PHYSICO-CHEMICAL PROPERTIES OF GROUNDNUT SHELL POWDER FOR DEVELOPMENT OF BIODEGRADABLE PACKAGING FILM	20
PRODUCTION AND CHARACTERIZATION OF PROTEIN ISOLATES FROM CHICKEN LIVER	21
DEVELOPMENT OF ENZYME LINKED IMMUNOSORBENT ASSAY USING RECOMBINANT CATHEPSIN B5 ANTIGEN FOR EARLY DIAGNOSIS OF BOVINE TROPICAL FASCIOSIS: A NEW APPROACH	22
DEVELOPMENT OF PALM SUGAR SUBSTITUTED YOGHURT	23
CONTROL OF BIOFILM IN FOOD PROCESSING ENVIRONMENT WITH METHANOLIC EXTRACTS OF CITRUS LIMON, AVERRHOA CARAMBOLA AND BRASSICA JUNCEA	24
INFLUENCE OF INTEGRATED FOLIAR NUTRITION TO COWPEA (VIGNA UNGUICULATA (L.) WALP)	25
DEVELOPMENT OF GAMMA RAYS INDUCED MUTANT LINES IN GUAVA WITH ENHANCED TOLERANCE LEVELS AGAINST FUSARIUM WILT	26
ADSORPTION LINKED FUNGAL DEGRADATION PROCESS FOR COMPLETE REMOVAL OF THE TEXTILE DYE LANASYN OLIVE: A LOW COST SOLUTION FOR MITIGATION OF DYE POLLUTION	27
NITROGEN MINERALIZATION RATE OF DIFFERENT ORGANIC SOURCES IN INCEPTISOL OF UMIAM, MEGHALAYA	28
INTEGRATED NUTRIENT MANAGEMENT IN VEGETABLE CROPS	29
NUTRIENT EXPERT®: A TOOL FOR ENHANCING RAINFED COTTON PRODUCTIVITY AND SOIL HEALTH	30
SMART PACKAGING: A PIONEERING TECHNOLOGY IN FOOD PRESERVATION	31
EFFECT OF APPLICATION OF FOLIAR NITROGEN AND POTASSIUM APPLICATION ON LEAF NUTRIENT CONTENTS OF FIG (FICUS CARICA L.)	32
XYLANASE PRODUCTION USING ALKALO-THERMOPHILIC BACILLUS HALODURANS KR-1 BY SOLID-STATE FERMENTATION	33
STUDY OF THE EFFECT OF MAGNESIUM IN ALONG WITH ORGANIC MANURES ON THE GROWTH AND YIELD ATTRIBUTES AND YIELD OF COTTON (GOSSYPIMUM HIRSUTUM L.) INTYPIC CHROMUSTERT	34
EFFECT OF GREEN SYNTHESIZED CU NANOPARTICLES PRIMING ON SEED QUALITY IN GREENGRAM	35
INFLUENCE OF INTEGRATED FOLIAR NUTRITION TO COWPEA (VIGNA UNGUICULATA (L.) WALP)	36

Title of the Abstract	Page No.
ADSORPTION LINKED FUNGAL DEGRADATION PROCESS FOR COMPLETE REMOVAL OF THE TEXTILE DYE LANASYN OLIVE: A LOW COST SOLUTION FOR MITIGATION OF DYE POLLUTION	37
PERFORMANCE OF MUSCARDINE RESISTANT THERMOTOLERANT BIVOLTINE BREEDS AND MUSCARDINE SUSCEPTIBLE PRODUCTIVE BIVOLTINE BREED OF SILKWORM, BOMBYX MORI L FOR COCOON AND REELING PARAMETERS	38
PHYTOCHEMICAL SCREENING OF PLANT EXTRACT OF BHRINGARAJ (ECLIPTA ALBA L.) MORPHOTYPES	39
A STUDY ON FOOD HABITS AMONG THE ADOLESCENT GIRLS OF VIJAYAPURA DISTRICT OF KARNATAKA	40
DETERMINANTS OF HOUSEHOLD ENERGY CONSUMPTION PATTERNS	41

**AAFS
2022**

THEME 01

**Sustainable
Transformation of
Agriculture & Food
Production System
in Alleviating
Poverty**

AN ANALYTICAL STUDY ON ROLE OF TRIBAL WOMEN IN CROP BASED LIVELIHOOD ACTIVITIES IN SOUTHERN RAJASTHAN

Asha Dagar*, Rajshree Upadhyay and Dhriti Solanki

Department of Extension Education and Communication Management,
College of Community and Applied Sciences,
Maharana Pratap University of Agriculture and Technology, Udaipur, 313004, Rajasthan

**Corresponding author: ashajaat12@gmail.com*

ABSTRACT

The tribal population is identified as the aboriginal inhabitants of our country. For centuries, they have been living a simple life based on the natural environment and have developed cultural patterns congenial to their physical and social environment. According to 2011 Census, the Scheduled Tribes (STs) comprise about 8.6 percent of India's population and tribal population in India constitutes over 104 million. Tribal women constitute half of the work force among tribals in India. They play an important role in their cultural, social, economic and religious ways of life and considered as an economic asset in their society. The present research is an attempt to see the information regarding role of tribal women in crop based livelihood activities in Rajasthan. The study was conducted in three districts of Rajasthan state namely Dungarpur, Udaipur, and Banswara with total 180 tribal women. Findings revealed that all the respondents independently participated in management of labor, application of manure and fertilizers, cleaning and drying in post-harvest management (100%). Majority of independently participated in harvesting (83.33 MPS), insect and pest control through indigenous method (82.5 MPS), seed/variety selection (81.94 MPS) and land preparation (81.38 MPS). Jointly with family members in insect and pest control through chemical application (56.66 MPS), credit/loan (60 MPS), threshing (60.27 MPS), winnowing (61.11 MPS), retention for sale (62.22 MPS), management of cash earned from sale of produce (62.77 MPS).

Keywords: *Tribal Women, Livelihood, Crop, Role, Analytical*

GENOME-WIDE LINKAGE MAPPING OF QTL/S FOR YIELD ASSOCIATED TRAITS UNDER DIFFERENT WATER REGIMES IN WHEAT

Sonia Sheoran^{1*}, Sushma Panwar¹, Arpit Gaur³, PC Mishra², BS Tyagi¹, Vikram Singh³,
Sindhu Sareen¹, Gyanendra Singh¹, Gyanendra Pratap Singh¹

¹ICAR-Indian Institute of Wheat & Barley Research, Karnal, Haryana

²JNKVV, ZARS, Powarkheda

³Ch. Charan Singh Haryana Agricultural University, Hisar, Haryana

Corresponding author: Sonia.Sheoran@icar.gov.in

ABSTRACT

Climate change has strong influence on the productivity of wheat. Drought stress is the major factor that reduces wheat grain yield. Therefore, breeding drought-tolerant wheat genotypes with relevant agronomic and adaptive traits by discovering the underlying candidate genes and alleles is vital for increasing grain yield (GY). In the present study, 210 F₁₀ RILs derived from the cross of DharwarDry/DPW621-50 were genotyped using Axiom 35K Wheat Breeders Array. Field trials were conducted at three locations i.e., Karnal, Hisar and Powarkhera over four consecutive years (2015-2019) under three contrasting regimes (drought, rainfed and irrigated). A high density linkage map was generated using 1134 polymorphic SNP markers. Four stable genomic regions on chromosomes 2B, 2D, 4A and 6B were identified, each with multiple tightly linked QTL (QTL clusters) associated with two to three yield components under water stress condition. The 2B QTL cluster was associated with grain yield, thousand-kernel weight and grains weight per spike which further explored for underlying candidate genes (CGs), followed by their evaluation based on Gene Ontology (GO) enrichment analysis. The genes were found to be involved molecular function (MF), cellular component (CC) and biological process (BP). Kompetitive allele-specific PCR markers for the four QTL clusters were developed and being assessed in diverse wheat panel. The identified QTL and the KASP (Kompetitive Allele-Specific PCR) marker developed for it will be highly valuable in fine-mapping the locus and in exploiting it for marker-assisted selection in wheat breeding programs.

Keywords: Wheat, Drought, 35K wheat SNP array, QTL

UPSCALING THE MINOR MILLET CULTIVATION FOR LIVELIHOOD IMPROVEMENT AND SUSTAINABLE INCOME FOR THE UNDERPRIVILEGED FARMING COMMUNITY

D. Thirusendura Selvi^{1*}, S. Juliet Hepziba² and S. Kanjana³

¹Department of Seed Science and Technology, Tamil Nadu Agricultural University,
Coimbatore, Tamil Nadu, India.

²Department of Plant Breeding and Genetics, Agricultural College and Research Institute,
Tamil Nadu Agricultural University, Madurai, Tamil Nadu

³Department of Human Development, Agricultural College and Research Institute, Tamil
Nadu Agricultural University, Madurai, Tamil Nadu

* Corresponding author: thirusenduraselvi.d@tnau.ac.in

ABSTRACT

Barnyard millet and little millet are important minor millets which considered to be eco-friendly crops, often grown without fertilization; they are suitable for fragile and vulnerable ecosystems. In spite of these advantages, underutilized and neglected in the cultivation part in several areas. It is also a known fact that the Theni, Madurai and Dindigul districts of southern Tamil Nadu have a major population of Scheduled caste (SC) and Scheduled tribes (ST), Among the tribes, "Paliyans" are living near the foothills of the Western Ghats, which is largely rural. These populations are really vulnerable communities that need a better agricultural system for livelihood improvement and nutritional security. Here, our aim was to improve incomes, nutritional status, and empowerment on the promotion of minor millets for the attainment of food security through agricultural interventions on seed production technology and value addition in minor millets such as barnyard millet and little millet that resolve agricultural production and ensures availability of quality seeds and helps in creating jobs of a vulnerable community. As part of the Natural Resources Data Management System (NRDMS) programme on SCST development, we initiated various agricultural activities to upscale the minor millet cultivation and consumption in eight blocks in three districts namely Theni, Madurai and Dindigul districts of Tamil Nadu, India. In summary, our holistic approach brings into the independent seed security system at the village level by insisting on the seed selection, seed production, value addition and exchange of seeds among the farming community for sustainable income.

Keywords: SCST farming community, Minor millets, Interventions, Income generation

CROP DIVERSIFICATION IN DIFFERENT AGROCLIMATIC ZONES OF KARNATAKA

Anitha S ¹ and Swathy S ²

¹Research Scientist, Centre for Climate Change, EMPRI, Bangalore-560078

²Project Associate Centre for Climate Change, EMPRI, Bangalore -560078

Corresponding author:anu.s.naik@gmail.com

ABSTRACT

Karnataka is the seventh-largest state in India in terms of geographical area and nurtures five percent of country's population with substantial food production. Crop diversification is a technique for improving the use of cultivable land, water, and other resources. In this study, 10th Agricultural census data on the area of different crops and gross cropped area in each district were collected from the Department of Economics and Statistics, Karnataka 2020-21 utilised to arrive Diversity Index (DI) of district. Simpson Diversity Index (SDI) has been used to analyse the diversity of each agro-climatic zone. Among the zones, transition zones perform better with a SDI of 0.92 in the Northern Transition Zone (NTZ) followed by the Southern Transition Zone (STZ) with 0.91 and the Northeastern Transition zone (0.88). Among the dry zones of Karnataka, Southern Dry Zones (SDZ) have the highest diversification index of 0.92 followed by Northeastern Dry Zone (NEDZ) and Central Dry Zone (CDZ) with 0.89 SDI and Northern Dry zone (0.88) and least with Eastern Dry Zone (0.87). Among the ten zones, the Hilly zone has the least SDI of 0.71 and the Coastal Zone (0.77) exhibits a better diversification compared to the hilly zone.

Keywords: Crop Diversification, Agro-climatic zones, Sustainable Development Goal, Simpson Diversity Index.

NEED OF CROP DIVERSIFICATION FOR DOUBLING FARMER'S INCOME IN BUNDELKHAND REGION OF CENTRAL INDIA - A SUCCESS STORY

Om Prakash, S. Naresh Kumar and R. N. Padaria

ICAR- Indian Agricultural Research Institute, Pusa, New Delhi

ABSTRACT

In central India, the farmers of Bundelkhand region are always practicing to increase their production and net profit from the crops they are growing at their fields. Whatever crops (food, fodder, fiber, fruits, pulses and oilseeds etc.) they might cultivate, the bottom line is to invariably get better price from their produce. The farmers can increase their income either by intensifying the existing enterprises or can move towards crop diversification (by growing the new crops), value addition or successful market linkages to improve their standard of living. A farmer, Mr. Ashish Rai is a good example of this strategy; He has undertaken farm diversification to enhance farm profits. With the expertise of ICAR- IARI, Pusa, New Delhi scientists under DST-MRDP project, he was advised and convinced to go for diversified farming into successful venture in the region. The farmer was engaged in traditional farming with his father but he wanted extra income during lean months of crops season as they owned 4 acre of land under wheat - black gram rotation system. He was suggested to adopt Wheat, Chickpea, Green gram, Black gram, Onion, Bottle gourd, Cucumber and Tomato Cultivation at his farm with seed treatment, line sowing, raised bed sowing, improved seed sowing and vegetables at early sowing of improved seeds of IARI, Pusa varieties during the year 2018. With the technical support and encouragement, he initiated vegetable cultivation of cucumber in the area of about one acre. With the result, he earned up to Rs. 92,200/- per acre (net income) in four months which is far remunerative than contemporary pulse crop. To improve the farm productivity now more growers have join hands with Sh. Ashish Rai to take up this venture. Further, to improve the farm productivity Sh. Ashish Rai has put 3 acre of land under short duration pulse crop like green gram (Pusa Vishal) in summer season. This cropping system provides him an annual net income of Rs. 53,280/- per cropping season. Sh. Ashish Rai is growing newly released high yielding varieties of wheat (HD-3086) and Chickpea (Pusa- 547) in 5 acre area which gave him net annual return of about Rs. 2.1 lakh per cropping season. He was also suggested to grow onion variety (Pusa Ridhi) in one acre. The average selling price of onion was Rs. 20/kg. and total production of onion was 92.5 q/acre which gave net return of about Rs. 1,85,000/- per cropping season. He has undertaken farm diversification to enhance farm profits and earned net farm income from Rs. 3 lakhs in 2018 to Rs. 5.5 lakhs in 2019-20. The adopted model is serving integrated and sustainable farming through diversification of profitable units and marketing linkages in the region.

TRAIT ASSOCIATION AND PATH-COEFFICIENT STUDIES IN SEGREGATING GENERATIONS OF BLACKGRAM (*VIGNA MUNGOL* HEPPER)

RhitishaSood*¹, Shailja Sharma¹ and Ajay Chauhan²

Department of Genetics and Plant Breeding, CSKHPKV, Palampur (H.P.), 176062, India.

Department of Vegetable Science, COA, CCS HAU, Hisar (Haryana) - 125 004, India.

*Corresponding author: rhitishasood5529@gmail.com

ABSTRACT

The Fabaceae family's blackgram is a self-pollinated ($2n=22$) short-duration *Kharif* legume crop with *V.mungo* var. *silverstris* as its ancestor. Its loaded with abundant macro and micro nutrients, besides from that, due to the crop's narrow genetic base, poor ideotype, non-availability of high yielding varieties, cultivation in harsh and marginal lands with poor management practises, and vulnerability to various biotic and abiotic stresses, the crop's yield potential has remained low and stable over time. In light of this, the goal of the study was to generate wider adaptable and high producing genotypes by determining nature and size of the relationship between yield and related attributes in 24 genotypes including crosses, parents and checks for eleven agro-morphological characters during *Kharif* 2018 and 2019 at CSK HPKV Breeding farm, Palampur (H.P.). According to correlation analyses, seed yield per plant demonstrated a substantial and positive relationship with pods per plant, biological yield, pod length, plant height, and 100 seed weight whereas biological yield and pods per plant had the most beneficial direct and indirect effects on the total connections between yield and other component attributes in F_2 and F_3 the generations that could be indicated as the best selection indices on a priority basis, which would be beneficial in improving genotype performance for efficient breeding programme.

SUSTAINABILITY OF COMMODITY BASED ASSOCIATIONS IN SOUTHERN KARNATAKA OF INDIA

Dr. Raghupathi D¹, Dr. Naresh Nt² And Mr. Venkatesha. M³

Professor and Associate Director of Extension¹, Senior Scientist and Head, Krishi Vigyan Kendra, Mandya² and Associate Professor(Horticulture)³, UASB, VC Farm Campus Mandya, Karnataka, India.

ABSTRACT

Recently, the Govt., of India has initiated community based farmers' groups based on the major crop grown in that specific agro-climatic zones. Such groups were known as Commodity Based Associations (CBA). These were grass root level autonomous registered bodies established in rural and urban areas around a single enterprise applying the good agricultural practices and using the best marketing channels to maximize the profits. The Research study was conducted in Southern Karnataka during 2017-18. The ICAR-University of Agricultural Sciences Bangalore (UASB) has initiated and formulated 10 CBA through Krishi Vigyan Kendras (KVKs) in its jurisdictional districts, in Southern districts of Karnataka State, these have been operational since 2015. There was necessity to find out how far these CBA were sustainable in getting the profits to the farmers?. In view of this, this research was conducted to understand the functioning patterns of CBA and their level of sustainability. The total random sample of respondents drawn was 50 from the selected CBA. The research design adopted was *ex-post-facto*. The data were collected with a pre-tested interview schedule and also using secondary sources with PRA tools where ever necessary to supplement the research information. The indicators for sustainability were identified based on the judges rating method and selected the relevant statements based on the face validity under each identified indicator. The range of sustainability was worked out and categorized least to most suitability level. The study found that the profits earned had been the one of the key indicators sustainability, by taking this in to cognizance, all the CBA of UASB, KVKs of Mandya, Chamarajnagar, Tumkur, Ramanagaram and Hassan districts, the extent of working functional level was moderate. Regarding CBA, the respondents perceived to have been, to some extent economical at the average level and with moderate level of sustainability. The overall percentage of the sustainability of ICAR-UASB-KVKs was 72.22% indicating that all the CBAs were sustainable, except the CBA of minor millets Tumkur District, the main reasons being non-availability immediate accessible to mills to process the produce and finding appropriate marketing channels to sell the minor millets produce in cities and towns. The implication of the study being, for future sustainability of all the CBA, there is a need of external agencies resource support, especially in marketing of the commodities.

Keywords: *Commodity Based Associations, Sustainability, Krishi Vigyan Kendras, Indicators and Commodities*

Theme 2

Technological Innovations in High-Tech Horticulture, Precision Farming and Agri Start-up

APPLICATION OF ARTIFICIAL INTELLIGENCE IN PLANT DISEASE DIAGNOSIS

Sruthy. M

Department of Plant Pathology, Dr. PDKV, Akola-444104

**Corresponding author: msruthy13@gmail.com*

ABSTRACT

Artificial intelligence (AI) holds the promise of driving an agricultural revolution at a time when we must produce more food using fewer resources. The main idea behind AI is to create technology that works similarly to the human brain. Artificial intelligence has a huge impact in all Industrial Sectors. AI accomplished solving numerous problems and saving a profitable resource by minimizing environmental deterioration. Artificial Intelligence is making a revolution in agriculture by replacing traditional methods by using methods that are more efficient and helping the world to become a better place. The agriculture sector can be considered as the backbone for any developing economy. To obtain the maximum yield from the crops, it is required that farmers should be provided with the best technologies and methodologies. Due to its ability to perceive the problems, developing the appropriate reasons for that and to establish optimal solutions for it, artificial intelligence can act as a great aid in addressing the diseases of crops. The population is expanding enormously with this expansion the interest of food and business is likewise expanding. Intervening of AI in Agriculture is serving farmers to recover their farming efficiency and diminish environmental hostile influences. Disease infection is the main drawback of Agriculture. To identify and detect the disease on agriculture product, the AI technique is introduced.

**AAFS
2022**

THEME

02



**Technological
Innovations in
High-Tech
Horticulture,
Precision Farming
and Agri Start-up**

A SAFETY ALARM SYSTEM FOR INJURY PREVENTION IN FODDER CUTTER MACHINE

Asha K. R.¹, Adarsh Kumar², J. K. Singh², H. L. Kushwaha², and Arpan Bhowmik²

¹Ph.D. Research Scholar, ²Principal Scientist

^{1&2}Division of Agricultural Engineering, ICAR-IARI, Pusa, New Delhi-110012, India

³Scientist, ICAR-Indian Agricultural Statistics Research Institute (IASRI), Pusa, New Delhi-110012, India

*Corresponding author: ashakrv199493@gmail.com

ABSTRACT

Agricultural activities are considered the most hazardous occupations with a high risk of fatal and non-fatal injuries supported by increased farm mechanization. This adversely impacts the productivity of farmworkers, health, safety, and economic status. Farmers, generally use the chaff cutter or fodder cutter machine to chop the fodder which adds enhanced fodder storage characteristics, but the machine can cause permanent upper limb (hand) injuries while working with it. To overcome this critical issue workers should be forewarned as their hand or upper limb enters the vicinity of an injury-prone zone of the fodder cutter machine. Thus, we worked to develop the microcontroller-based alarming system. A passive infrared (PIR) sensor contains a motion detection element used here to detect the infrared radiation emitted by the human body. The sensor was pre-tested under different conditions to observe the response of the human and non-human subjects. The system was designed to sound an alarm as the hand motion is detected in the danger zone. The effects of distance between the sensor and human hand (5 to 20 cm), different hand orientations (pronation, supination, and fodder holding position), along with room temperature, and fodder temperature were studied with the subjects of different age groups. For these relevant parameters, the regression equations were derived using the Response Surface Methodology (RSM). According to the study results, 12.5 cm ahead of the identified dangerous area was the optimal distance for mounting the sensor system on the feeding chute of the fodder cutter. When a hand orientation is pronated or supinated, the sensor gives a high response in response to different temperature conditions, followed by a holding position. A temperature in the range of 24 to 27°C was ideal for the best use of the sensor system. Worker response to audible frequencies was also investigated using hand movement speed.

Keywords: PIR sensor, safety alarm system, fodder cutter machine, injury, hand orientation, etc.

ROLE OF GEO - SPATIAL TECHNOLOGY IN LAND DEGRADATION ASSESSMENT IN BALLIA DISTRICT OF UTTAR PRADESH, INDIA

Plabani Roy¹ and Nirmal De²

¹PhD research scholar, ICAR- Indian Agricultural Research Institute, New Delhi-110012

²Professor, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh – 221005

Soil Science and Agricultural Chemistry, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh – 221005

ABSTRACT

Land degradation is a significant issue in agricultural productivity, caused by a variety of reasons such as salinity, alkalinity, erosion etc. Remote sensing and geographic information systems (GIS) are excellent methods for detecting, analysing, mapping, and monitoring land degradation. A study was undertaken in the Ballia district of Uttar Pradesh to develop a spatial variability map and calculate remote sensing indices to determine the level of deterioration. For a period of 26 years, from 1994 to 2019, Landsat data were utilised to interpret images and compute several soil degradation indices such as the Normalized Difference Soil Index (NDSI). NDSI fell dramatically from 1994 to 2019, with a particularly steep drop in 2004. The NDSI value range in the study area was -0.078 to -0.141, -0.400 to -0.056, and -0.292 to -0.121 in 1994, 2004 and 2019. The sodium content in the research region is divided into three classes: low, medium and high indicating a range of 78 - 232 Kg ha⁻¹, 232 - 348 Kg ha⁻¹, and 348 - 745.28 Kg ha⁻¹ respectively. High abundance of soil-sodium content is observed in Sohaon and Rasra effecting soil health. In the southeast, 70% of the research region had high Na⁺ concentrations, indicating poor soil health due to deflocculation.

Keywords : Land degradation, Remote sensing, Geographic information systems (GIS), Normalized Difference Soil Index (NDSI)

**AAFS
2022**

THEME 03



**Advances in
Aquaculture
Research towards
Food and Nutritional
Security**

INFLUENCES OF REPLACING DIETARY FISH MEAL BY SILKWORM PUPAE MEAL ON GROWTH PERFORMANCE, NUTRIENT UTILIZATION AND WHOLE-BODY PROXIMATE COMPOSITION OF PACIFIC WHITE SHRIMP (*PENAEUS VANNAMEI*)

Govindharaj Sathishkumar^{1,2}, Nathan Felix², Elangovan Prabu² and
Kalidoss Manikandan²

¹Tamil Nadu Dr. J. Jayalalithaa Fisheries University, Institute of Fisheries Post Graduate
Studies, Chennai – 603 103.

²Tamil Nadu Dr. J. Jayalalithaa Fisheries University, Directorate of Incubation and Vocational
Training in Aquaculture, Chennai – 603 112.

ABSTRACT

A 45-day feeding trial was carried out to evaluate the effects of replacing fish meal (FM) with silkworm pupae meal (SWP) on growth performance, nutrient utilization and whole-body proximate composition of Pacific white shrimp (*Penaeus vannamei*). Five isonitrogenous (36% crude protein) diets were formulated in which the control diet contained 24% of FM and 20% (SWP 20), 40% (SWP 40), 60% (SWP 60) and 80% (SWP 80) of FM protein were replaced with SWP. Each diet was fed to triplicate groups (20 shrimp per replicate) of Pacific white shrimp (an average weight of 3.86 ± 0.20 g) to apparent satiation thrice a day (08.00, 12.00, 16.00 hours). The results showed that no significant difference ($p > .05$) was found in survival rate of *P. vannamei* fed silkworm pupae meal based diets. Significant differences ($p < .05$) were observed in growth performance such as final weight, weight gain, average daily growth, feed conversion ratio, feed efficiency ratio, protein efficiency ratio and specific growth rate of *P. vannamei* fed silkworm pupae meal based diets. Besides, silkworm pupae meal based diets did not influence the whole-body proximate composition of *P. vannamei*. Finally, the results of the current study showed that *P. vannamei* can effectively utilize dietary silkworm pupae meal up to 60% without impairing growth performance, nutrient utilization and whole-body proximate composition of shrimp.

Keywords: Fish meal replacer, Feed utilization, Pacific white shrimp, Silkworm pupae meal and Specific growth rate.

**AAFS
2022**

THEME

04



**Climate Change
Resilient
Agriculture**

CLIMATIC CHANGE AND RAINFALL MODELLING - A CASE STUDY OF ALAPPUZHA, KERALA

NEETHU R. S^{1*}, BRIGIT JOSEPH² and RESHMA P³

¹Ph. D. Scholar, Department of Agricultural Statistics, UBKV, Pundibari, Cooch Behar, West Bengal 736165

²Professor, Department of Agricultural Statistics, College of Agriculture, Vellayani, Kerala Agricultural University, Trivandrum-695304

³Ph. D. Scholar, Department of Plantation crops and Processing, , Pundibari, Cooch Behar, West Bengal 736165

**Corresponding author: neethurs37@gmail.com*

ABSTRACT

A study was made in this paper to analyse climate change overtime occurring from 1997 to 2018 in Alappuzha district of Kerala. The major climatic parameter includes maximum and minimum temperature and rainfall over a period of 22 years. The average monthly maximum temperature over the years varied from 20.97° C in July to 33.72° C in March which indicated a variation in the maximum temperature from June to April in a year. For minimum temperature, the highest value was found during the month April, May and lowest in January. Highest rainfall of 10904 mm in June followed by 9620.02 mm rainfall in July and very poor in January (294.7 mm) was noticed. Trend analysis based on Mann-Kandall (MK) and Sen's slope estimation were performed to assess climate change overtime occurred. A slight decreasing trend was observed for annual and seasonal rainfall during the study period. But for maximum and minimum temperature a clear increase in trend was noticed except during summer and winter wherein a decline in trend was observed. Even though no significant trend was noticed in rainfall except for annual and north east monsoon and the slope estimator was negative indicating a decline in rainfall. The SARIMA model was fitted to monthly rainfall and the model parameters were obtained by using maximum likelihood method and the best model were selected using information criteria. ARIMA (2, 0, 2) × (1, 1, 0)₁₂ was found best fit for rainfall.

Keywords : Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC) and Hannan-quinn coefficient

SCIENTIFIC AND MANAGERIAL INNOVATIONS FOR PROMOTING CLIMATE SMART AGRICULTURE

Archana V. Mahida¹; Pooja R. Naik² and T. R. Ahlawat³

^{1 & 2} Senior Research Fellows, NAHEP-CAAST Sub-Project, NAU, Navsari-396450

³ Director of Research & Dean PG Studies, NAU, Navsari

*Corresponding author: mahidaarchana24@gmail.com

ABSTRACT

Climate Smart Agriculture (CSA) is an approach to help guide actions to transform and reorient agricultural systems. The challenge is intensified by agriculture's extreme vulnerability to climate change. Climate change's negative impacts are already being felt, in the form of increasing temperatures, weather variability, shifting agroecosystem boundaries, invasive crops and pests, and more frequent extreme weather events. On farms, climate change is reducing crop yields, the nutritional quality of major cereals and lowering livestock productivity. CSA is an approach that involves several aspects i.e. encouraging policy frameworks, enhancement of financing options, deploying practises on the ground etc. CSA encompasses on-farm and off-farm actions, as well as technologies, policy, institutions and investment. The World Bank Group (WBG) is currently scaling up climate-smart agriculture, In 2020, 52 percent of World Bank financing in agriculture also targeted climate adaption and mitigation. CSA is agriculture that increases productivity, improves resilience and mitigates climate change. Small holder adoption of farming technology is necessary to speed the transition to CSA. Managerial innovations involve micro farm-level approaches, farm system approaches and resilient supply chain management. Equally important are scientific innovations that address the limitations of the existing systems and barriers in the era of climate change. Adoption of CSA would impart sustainability and profitability to the existing farm systems, however there is an urgent need to conduct further research on this aspect so as to improve its adoption even by the smallest of the land holders.

Keywords: CAS, Micro Farm, Managerial innovations and Institutions innovations

CLIMATE RESILIENT AGRICULTURE

Omprakash^{1*}, Prerna Dogra² And Ramesh Chand Asiwal³

¹Assistant Professor, Department of Plant Breeding and Genetics, ²Assistant Professor, Department of Soil Science and Agricultural Chemistry, ³Assistant Professor, Department of Agricultural Economics, Sri Karan Narendra Agriculture University, Jobner, Jaipur, Rajasthan- 303329 (INDIA)

**corresponding Author: omprakash.pbg@sknau.ac.in*

ABSTRACT

Agriculture is the primary and basic source of livelihood for more than half of the population in India. One of the prevailing key challenges being witnessed by the agriculture and food security is ever changing climate leaving the disastrous impact in the form extreme weather conditions and Indian agriculture is more vulnerable to it since a large portion of population directly depends on it. Climate resilience is fundamental concept to deal with the climate change and to cop up with the existing and fourth coming risk of climate change and food security, climate resilient agriculture can serve as the alternate approach. Climate resilient agriculture is an integrated multi-dimensional approach to achieve sustainable development goals with the help of available natural resources through crop and livestock production systems. It is a high time to adopt and practice the climate resilient agriculture to achieve higher productivity and better farm income for long term under the existing climate change scenario. The goal of sustainable development through climate resilient agriculture can be achieved by implementing appropriate mitigation technologies (tolerance breeding against existing adverse climate factor), water and nutrient management, adopting conservation agriculture practices, real time weather forecasting and crop monitoring through agro-advisories.

Keywords: Agriculture, Resilience, Climate Change, sustainable development and tolerance

CLIMATE CHANGE AND ITS IMPACT CROP WATER REQUIREMENT OF MULBERRY (MORUS SPP., MORACEAE) CROP IN YADGIR DISTRICT, KARNATAKA, INDIA

D. K. Hadimani¹ and J. B. Kambale²

1. Department of Sericulture, College of Agriculture, Bheemarayanagudi, University of
Agricultural Sciences, Raichur-585104, India

2. Department of Agricultural Engineering, College of Agriculture, Bheemarayanagudi,
University of Agricultural Sciences, Raichur-585104, India

**Corresponding author: jbkambale@gmail.com.*

ABSTRACT

This study was carried out in Yadgri District, North Eastern Karnataka, India to analyse trends in crop water requirement under various climate change scenarios to provide projections of changes in crop water requirement. The scenarios that may be considered for evaluation were created from the reports of the Indian Network for Climate Change Assessment (INCCA) and the Inter-Governmental Panel on Climate Change (IPCC). In a number of climate change scenarios, the water requirements for crops were calculated using a CROPWAT-8.0 model. In overall, it showed a decreasing trend in the in Mulberry crop water requirements during the past 35 years. Even when various climate change scenarios used, there has been an increasing ET_c tendency observed for Mulberry in studied area. Climate change was discovered to have an effect on the water requirements of the mulberry crop. It was advised to help with this that water conservation activities such rainwater collecting, soil and water conservation, and improved ground water recharge should be performed in the research area to lessen the risk of production loss owing to fluctuating water availability.

Keywords: *Trend Analysis, IPCC Scenarios, CROPWAT-8.0*

**AAFS
2022**

THEME

05



**Post-Harvest
Technology: Agri-
Value & Supply
Chain for
Sustainable
Production**

FORMULATION AND EVALUATION OF THE PHYSICO-CHEMICAL QUALITY OF ANTI-DIABETIC POLYHERBAL FORMULATIONS

Bharathkumar A.^{1*}, S. L. Jagadeesh², Bhuvaneshwari G.³, Chandrashekhar, V. M.⁴,
Mallikarjun G. Awati⁵, Shashikanth Evoor⁶ and Y. C. Vishwanath⁷

^{1,3}Department of Post Harvest Technology, College of Horticulture, Bagalkot, Karnataka,
India

²Department of Post Harvest Technology, College of Horticulture, Bengaluru, Karnataka,
India

⁴Department of Pharmacology, Hanagal Shri Kumareshwar College of Pharmacy, Bagalkot,
Karnataka, India

⁵Department of Crop Physiology, College of Horticulture, Bagalkot, Karnataka, India

⁶Department of Vegetable Science, College of Horticulture, Bagalkot, Karnataka, India

⁷Department of Plantation, Spices, Medicinal and Aromatics Crops, College of Horticulture,
Bagalkot, Karnataka, India

*Corresponding author: bharathkumara4@gmail.com

ABSTRACT

In the current investigation, seven polyherbal formulations were developed using fruits, vegetables, medicinal herbs and spices by considering their anti-diabetic potential. Polyherbal formulations were carefully composed using thirteen medicinal herbal powders (*Syzigium cumini* – jamun seeds, *Embelica officinalis* – aonla fruits, *Punica granatum* – pomegranate peel, *Artocarpus heterophyllous* – jackfruit matured bulb, *Momordica charantia* – bitter gourd fruits, *Allium sativum* – garlic clove, *Murraya koenigii* – curryleaves, *Trigonella foenum graecum* – fenugreek seeds, *Cinnamomum verum* – cinnamon bark, *Curcuma longa* – turmeric rhizome, *Zingiber officinale* – turmeric rhizome, *Costus igneus* – insulin leaves and *Azadirachta indica* – neem leaves). Physico-chemical parameters such as moisture content, water activity, bulk density, tapped density, Carr's index, Hausner's ratio, angle of repose, total ash, pH, water-soluble and alcohol-soluble extractive values were determined according to standard procedure. The moisture content and water activity of seven polyherbal formulations were ranged from 7.92 to 8.43 % and 0.33 to 0.35, respectively. Bulk density and tapped density of all the seven polyherbal formulations were in the range of 0.43 - 0.46 g/cm³ and 0.56 – 0.60 g/cm³, respectively. The total ash content varied from 5.83 to 7.83 per cent in polyherbal formulations. Water-soluble and alcohol-soluble extractive values of all the seven polyherbal formulations were in the range of 8.00 - 13.75 % and 8.30 - 11.17%, respectively. The physico-chemical analysis revealed better stability and flowability, relatively low level of contamination with good quality polyherbal formulations.

Keywords: polyherbal formulation, antidiabetic, fruits, vegetables

RECENT TRENDS IN PECTIN EXTRACTION FROM APPLE POMACE

Ruchi Sharma^{1*}, Aastha Verma¹, Harpreet Kaur Saini¹, Anupama Anand¹, Chahat Thakur¹, Anjali Gautam¹

¹Research scholar, Dr Y.S. Parmar University of Horticulture & Forestry Nauni, Solan, HP
Dr Y.S. Parmar University of Horticulture & Forestry Nauni, Solan, HP
Department of Food Science and Technology Dr. YSP UHF, Nauni Solan H.P.
173230

ABSTRACT

Valorization of fruit processing by-products covers the most recent advances in the field of fruit processing following sustainability principles. Huge amount of apple pomace is being produced globally by the industries involved in manufacturing and consumption of apple related products. However, apple pomace is a potential undervalued bio-resource for value addition of food products and natural health products. Pectin is one of the most important constituent of apple pomace. The most commonly used method for pectin production is the acid extraction method by using different acids viz., sulfuric, phosphoric, acetic or hydrochloric acid. Although acid extraction is economical, but can damage the pectin structure and cause environmental problems. For this reason, different extraction methods are investigated to isolate the pectin with higher yield at low temperatures and in short time with less or no acidic solvent use. Enzymatic extraction, ultrasound-assisted extraction, sub-critical water extraction, microwave-assisted extraction and radio frequency assisted extraction are the recently used ecofriendly techniques which are being used to extract pectin from apple pomace. These techniques offer several advantages, including shorter extraction time, increased yield, reduction or suppression of solvents, and minimization of the environmental impact. Apple pomace derived pectin has diverse food applications such as that of a gelling agent, stabilizer, fat replacer, etc. In the nutraceuticals arena, apple pectin exhibits a number of functions, from decreasing blood fat to combating various types of cancers and also acts as a delivery vehicle for pro-biotics and possesses potential pre-biotic nature which can enable its phenomenal utilization in promoting health.

Keywords: *Pectin, Nutraceuticals, Pro-biotics, Prebiotics, Ecofriendly techniques*

DEVELOPMENT AND NUTRITIONAL EVALUATION OF DRAGON FRUIT PEEL AND CARROT POMACE INCORPORATED COOKIES

Prerana Shere, Pranjali Malakar, Amit Kulthe

MIT School of Food Technology, MIT Art, Design and Technology University,
Pune-412201, India.

*Corresponding author: sherepd@gmail.com

ABSTRACT

The fruit and vegetable processing industry waste is known to be a good origin of natural bioactive compounds and could open the gateway for formulation of low cost functional food. In this research, sincere efforts were made to develop Dragon fruit peel powder (DFPP) and Carrot pomace powder (CPP) with the aim to reduce total fat content in cookies. The refined wheat flour, DFPP and CPP were mixed in the proportion of 90:5:5, 80:10:10, 65:20:15 and 50:30:20 respectively to develop cookie samples which were evaluated for sensory and nutritional quality. The result of sensory evaluation, based on 9 point hedonic scale, demonstrated overall acceptability (8.0) for sample containing 65:20:15 proportions. The proximate analysis carried out revealed- moisture (5.6%), carbohydrate (53.41%), fat (22%), protein (8.06), crude fiber (4.5%) and crude ash (6.43%) content in developed cookies sample whereas the nutritional composition reflected on the content of calcium (15mg), iron (0.8mg), carotenoids (2.16mg), vitamin C (2.83mg) and % DPPH inhibition (59.98%). The improved nutritional composition of the developed cookies reflected on the possibility of incorporating the DFPP and CPP at sensory preferred level (20:15).

Keywords: Dragon fruit peel, Carrot pomace, cookies, waste valorization

EXTRACTION OF LOW METHOXYL PECTIN FROM JACKFRUIT: ULTRASONICATION ASSISTED EXTRACTION USING RESPONSE SURFACE METHODOLOGY

Vivek Saurabh, Anamika Thakur, Misha Poddar, Shatakshi Mishra and Charanjit Kaur*

Division of Food Science and Postharvest Technology, ICAR – Indian Agricultural
Research Institute, New Delhi

**Corresponding author: charanjitkaur6@gmail.com*

ABSTRACT

Valorisation of jackfruit (*Artocarpus heterophyllus*) waste for extraction of pectin can add value to the by-products arising from processing industry. In this study, ultrasound assisted extraction and mild oxalic acid was used for extraction of pectin from jackfruit peels. A response surface methodology was employed to optimize the ultrasonic assisted extraction (UAE). The pectin obtained from UAE and conventional heating (CAE) were compared in terms of their physicochemical and antioxidant properties. The optimum UAE conditions were: ultrasound amplitude = 30%, sonication time = 12.23 min, oxalic acid concentration = 0.12 N. Under these conditions, the pectin yield and galacturonic acid content was $12.04 \pm 0.10\%$ and $68.65 \pm 0.10\%$, respectively. Characterization of pectin revealed that the degree of methyl-esterification (DM) ranged between 43.33 and 41.94% for UAE and CAE respectively. Lower DM value (<50%) categorizes this pectin as LMP which has vast applications in formulating low sugar products with low glycemic foods. Both pectin possessed considerable antioxidant activities, while pectin from UAE had stronger antioxidant abilities than CAE. Overall it seems jack fruit pectin is a potential candidate of LMP for applications in low sugar food products. Oxalic acid and UAE are alternative 'green' and safe methods for enhanced recovery and techno-functional quality of pectin from jackfruit waste.

PHYSICO-CHEMICAL PROPERTIES OF GROUNDNUT SHELL POWDER FOR DEVELOPMENT OF BIODEGRADABLE PACKAGING FILM

Sukhdeep Kaur¹, Gagandeep Kaur² and Gurveer Kaur*

Department of Processing and Food Engineering, Punjab Agricultural University, Ludhiana
141004

*Corresponding author: kaurgurveer91@pau.edu

ABSTRACT

Groundnut shell is a beneficial bio-waste in agricultural industries, a leftover product after the processing of groundnut. The waste of groundnut shell has many applications due to its compositional value and used mainly as organic material in biogas industries, bioethanol production industries and paper and pulp industries. The present study was aimed to determine the physico-chemical properties of groundnut shell powder in accordance to develop packaging film. The parameters which affect the development of packaging film like cellulose, hemicelluloses and lignin were also determined. Standard AOAC methods were used to determine each parameter of groundnut shell powder. The moisture content, ash content, protein, bulk and true density were found to be $7.1 \pm 0.05\%$, $2.7 \pm 0.03\%$, $0.2 \pm 0.01\%$ and $0.1 \pm 0.01\%$ respectively. The cellulose content was observed $22 \pm 0.17\%$ and hemicelluloses and lignin were found to be $10.4 \pm 0.11\%$ and $2.4 \pm 0.07\%$ respectively. As the groundnut shell powder has significant amount of cellulose and hemicelluloses so it can be preferred to be used as raw material in developing the biodegradable packaging film which furthermore reduces the eco waste by proper utilization of the groundnut shell.

Keywords: Cellulose, groundnut shell powder, hemicelluloses, lignin, packaging film

**AAFS
2022**

THEME 06



**Advances in Dairy
and Veterinary
Sector Towards
Sustainable
Development Goals**

PRODUCTION AND CHARACTERIZATION OF PROTEIN ISOLATES FROM CHICKEN LIVER

Hamna Vahab, Devendra Kumar*, Tanbir Ahamd, A. K. Biswas and S. K. Mendiratta

Division of Livestock Products Technology, ICAR-Indian Veterinary Research Institute,
Izatnagar, Bareilly-243122, UP, India

ABSTRACT

The study was conducted to isolate protein from chicken liver and characterization of its techno-functional properties. Prior to protein isolation, protein solubility test was carried out to determine the highest solubility at a particular pH. Isolates prepared through acidic and alkali solubilization technique was freeze dried and subjected for different quality evaluation. In protein solubility test, highest solubility was observed at pH 1.5 (26.54 ± 0.04 mg/ml) and at pH 2.0 (27.01 ± 0.08 mg/ml) while under alkaline condition, highest solubility was observed at pH 11.0 (31.23 ± 0.05 mg/ml) and at pH 11.5 (27.76 ± 0.01 mg/ml). At pH 1.5, 2.0, 11.0 and 11.5, the recovery yield of proteins in isolate was 42.9%, 45.83%, 61.13% and 56.99%, respectively. The total protein content in isolates were 70 ± 0.054 , 73.5 ± 0.045 , 74.5 ± 0.045 and 70 ± 0.052 at pH 1.5, 2.0, 11.0 and 11.5, respectively. The total pigment (ppm) was 150.96 ± 0.86 , 172.04 ± 0.65 , 93.84 ± 0.39 and 121.04 ± 0.65 at pH 1.5, 2.0, 11.0 and 11.5, respectively. The bulk density (g/ml) of protein isolates was 0.33 ± 0.001 , 0.32 ± 0.001 , 0.26 ± 0.006 , and 0.27 ± 0.008 at pH 1.5, 2.0, 11.0 and 11.5, respectively. Fat Absorption capacity (ml/g) was 3.77 ± 0.101 , 4.21 ± 0.084 , 3.76 ± 0.117 and 5.07 ± 0.066 at pH 1.5, 2.0, 11.0 and 11.5, respectively. The water absorption capacity (ml/g) was 2.45 ± 0.080 , 2.54 ± 0.085 , 2.79 ± 0.077 and 3.34 ± 0.041 at pH 1.5, 2.0, 11.0 and 11.5, respectively. Except bulk density and total pigment, it was observed that values for all recorded parameters were significantly higher for protein isolates at different pH as compared to whole liver powder. From this study it can be concluded that protein isolation could be one of the ways to utilize poultry liver for production of high protein food ingredient.

Keywords: Chicken liver, Protein isolate, Functional food ingredient, pH-Shift method, Protein solubility test

DEVELOPMENT OF ENZYME LINKED IMMUNOSORBENT ASSAY USING RECOMBINANT CATHEPSIN B5 ANTIGEN FOR EARLY DIAGNOSIS OF BOVINE TROPICAL FASCIOLOSIS: A NEW APPROACH

Pinaki Prasad Sengupta^{1*}, Siju Susan Jacob¹, Bandakote Sreeramareddy Pavithra¹, Atru
Gnana Surya Chandu¹, Opinder Krishna Raina²

¹ ICAR- National Institute of Veterinary Epidemiology and Disease Informatics, Yelahanka,
Bengaluru 560064, Karnataka, India.

² ICAR-Division of Parasitology, Indian Veterinary Research Institute, Izatnagar 243122,
Uttar Pradesh, India.

*Corresponding author: pinakisengupta1964@gmail.com

ABSTRACT

Bovine tropical fasciolosis caused by *Fasciola gigantica* is a major parasitic disease in the tropical countries responsible for significant production losses in animal husbandry practices. In the early stage of the parasite i.e., juveniles cause havoc damage in the bovine host while migrating through liver. Globally the diagnosis of the disease is done by the detection of adult parasite's ova passed in the faeces and unfortunately no test is available to detect the infection at early stage when it causes maximum harm. The cathepsin B5 is a cysteine protease which is present in excretory-secretory product of the fluke predominantly in juvenile stage. The present study is aimed to develop an enzyme linked immunosorbent assay (ELISA) using recombinant cathepsin B5 protein as antigen. The developed ELISA showed 95.3% sensitivity and 92.4% sensitivity with a cut-off of 60% percent positive. It also showed 0.768 (95% CI 0.648 to 0.889) weighted Kappa value when compared with ELISA using native cathepsin antigen. 906 bovine samples collected from different parts of the country were screened and around 40 per cent seroprevalence was recorded. The developed assay can be exploited as a potential tool in the diagnosis of bovine tropical fasciolosis.

Keywords: Bovine; fasciolosis; Cathepsin; ELISA.

DEVELOPMENT OF PALM SUGAR SUBSTITUTED YOGHURT

L.Vijay*¹, N.Karthikeyan², G.Kumaresan¹ and C.Pandiyan¹

¹Department of Livestock Products Technology (Dairy Science), Veterinary College and Research Institute, TANUVAS, Namakkal-637002, Tamil Nadu, India.

²Department of Food Business Management, College of Food and Dairy Technology, TANUVAS, Chennai-600052, Tamil Nadu, India.

ABSTRACT

A detailed study was carried out to substitute cane sugar with palm sugar in the preparation of yoghurt. The yoghurt samples were prepared by replacing cane sugar with palm sugar at 25%, 50%, 75% and 100% levels, and were designated as T1, T2, T3 and T4 respectively. The yoghurt sample without replacement by palm sugar was taken as control. The physicochemical, textural, microbial and sensory properties of the control and treatment yoghurt samples were evaluated. There found to be no variation in the curd setting time of control and treatment samples. All the yoghurt samples uniformly maintained the pH range of 4.54 to 4.57. The fat and total solids content of the control and treatments exhibited no significant difference among them. The textural properties like firmness and consistency of control and treatments exhibited a significant difference ($P<0.01$). As the cane sugar replacement level increased, the firmness and consistency scores of the treatments also increased. The coliforms and yeast and mould count of control and treatments exhibited no significant difference among them and were within the FSSAI (2012) prescribed limits. A panel of six trained judges carried out the sensory evaluation of the yoghurt samples, and the sensory parameters (such as appearance, body and texture, flavour and overall acceptability) of control and treatments revealed no significant differences among them. Nevertheless, the scores exhibited an increasing trend towards the 100 per cent substitution of cane sugar with palm sugar. Therefore, the substitution of cane sugar with palm sugar in the yoghurt improved the acceptability, as per the scores given by the sensory panel. Hence, it can be concluded that the yoghurt samples can be prepared by replacing cane sugar with palm sugar up to 100 per cent level without affecting the physicochemical, textural, microbial and sensory properties.

Keywords: *Yoghurt, Palm sugar, Sensory properties*

**AAFS
2022**

THEME 07



**Role of
Agrochemicals,
Biological and
Technological
Interventions Towards
Safe Food and
Nutritional Security**

CONTROL OF BIOFILM IN FOOD PROCESSING ENVIRONMENT WITH METHANOLIC EXTRACTS OF *CITRUS LIMON*, *AVERRHOA* *CARAMBOLA* AND *BRASSICA JUNCEA*

Rajendran Thomas¹, Devarshi Bharadwaj², Songeeta Singha³, Abinash Kumar², Vivek Kumar Gupta⁴

¹Senior Scientist · ²Young Professional-II · ³Senior Research Fellow · ⁴Director
Food Quality Control Laboratory, Indian Council of Agricultural Research-National Research
Centre on Pig, Rani, Assam-781131

ABSTRACT

Yersinia enterocolitica is the third commonly reported enteropathogen that mostly infects humans from contaminated processed meat and other food products. Its biofilm forming ability allows the organism to thrive after regular cleaning and disinfection, which in turn can create problems for its control in food processing environments. Extensive research has been carried out for phytochemicals serving as antimicrobial agents over the past few decades. Moreover, their potential as a control measure for biofilms in food industry has also been studied upon, with a large number of phytochemicals reported to exhibit antibiofilm activities. Plant derived methanol extracts of *Citrus limon*, *Averrhoa carambola* and *Brassica juncea* were subjected to preformed biofilms of *Y. enterocolitica* in microtitre plates with different concentrations and then were stained with crystal violet for measuring their biofilm activity by spectrophotometry. Extract of *Citrus limon* was able to inhibit biofilm better than *Averrhoa carambola* and *Brassica juncea*. The results were also confirmed by microscopy where visualisation of depletion of biofilm was observed. The resulting inhibition could be attributed to the presence of bioactive phenolic compounds in the extracts which was further confirmed through phytochemical and GC-MS/MS analysis of the extracts.

Keywords: *Yersinia enterocolitica*, biofilm, *Citrus limon*, *Averrhoa carambola*, *Brassica juncea*, microtitre plate assay.

INFLUENCE OF INTEGRATED FOLIAR NUTRITION TO COWPEA (*VIGNA UNGUICULATA* (L.) WALP)

Kavyashree C¹., S. A. Biradar., V. S. Devaranavadagi and S. B. Kalaghatagi

Department of Agronomy, College of Agriculture, Vijayapur - 586101
University of Agricultural Sciences, Dharwad - 580005 (Karnataka), India

*Corresponding author: kavya1341997@gmail.com

ABSTRACT

A field experiment was conducted to study the “Influence of integrated foliar nutrition to cowpea (*Vigna unguiculata* (L.) Walp)” in medium black soils at ICAR - Krishi Vigyan Kendra (KVK) Farm, Vijayapur during summer 2021. The experiment was laid out in Randomized Complete Block Design with nine treatments replicated thrice. The results revealed that, integrated foliar nutrition through different nutrients exerted significant influence on the growth and development parameters, yield attributes, yield, nutrient uptake and economic returns of cowpea. Among them, the treatment RPP + foliar spray of 19:19:19 @ 1% + Vermiwash @ 10% at flower initiation stage and peak flowering stage recorded significantly higher seed yield (1692 kg ha⁻¹), haulm yield (3466 kg ha⁻¹), net returns (₹ 59,398 ha⁻¹) and BC ratio (3.36) compared to all other treatments. Recommended Package of Practices recorded lower seed yield (1197 kg ha⁻¹), haulm yield (2208 kg ha⁻¹), net returns (₹ 36,648 ha⁻¹) and BC ratio (2.58) at flower initiation stage and peak flowering stage over rest of the treatments and lowest was recorded with Recommended Package of Practices.

Keywords: Cowpea, foliar nutrition, yield

DEVELOPMENT OF GAMMA RAYS INDUCED MUTANT LINES IN GUAVA WITH ENHANCED TOLERANCE LEVELS AGAINST FUSARIUM WILT

T R Usharani, Megha Ganachari, Vasugi C, Sriram S

ICAR-Indian Institute of Horticultural Research, Bengaluru, 560 089

ABSTRACT

Guava (*Psidium guajava*) is one of the most important commercial fruit crops in tropical and subtropical countries of the world. Fusarium wilt of guava is a dreaded disease complex causing enormous economic losses due to complete death of plants under severe disease incidence. There is no resistant source available in cultivated species of guava for Fusarium wilt pathogen. Hence, induced mutation was attempted with matured seeds of purple guava (*Psidium guajava*) using gamma irradiation (250 Grays) at ICAR-IIHR. Mutant lines were screened *in vitro* with the partially purified fusarium toxin (40% v/v) and the disease progression was studied. Out of 10,000 seedlings screened, four were selected that showed enhanced tolerance against *Fusarium oxysporum* f sp *psidii* under pot condition. Morphological and tissue analysis confirmed the stable tolerance against pathogen. As the plants survived after four months of challenge inoculation with *Fusarium oxysporum* f sp *psidii*, these lines can be further utilized in root stock development programme for inducing tolerance against guava wilt disease.

Keywords: Guava, mutation, Fusarium, tolerance, root stock

ADSORPTION LINKED FUNGAL DEGRADATION PROCESS FOR COMPLETE REMOVAL OF THE TEXTILE DYE LANASYN OLIVE: A LOW COST SOLUTION FOR MITIGATION OF DYE POLLUTION

Samchetshabam Gita^{1,2*}, Satya Prakash Shukla¹

¹Aquatic Environment and Health Management Division, ICAR-Central Institute of Fisheries
Education, Mumbai, Maharashtra, 400061

²College of Fisheries, CAU (I), Tripura, 799210, India

ABSTRACT

Textile dye effluents have been reported for many deleterious effects; therefore, it is essential to remove the dyes from effluents before release into waterbodies. This report describes a two-step process for decolorization of textile dye using sugarcane-bagasse (SCB). The first-step of the process involved functionalization of SCB with alginic acid for packing in column and assessing its performance for adsorptive removal of Lanasyne olive. The designed column showed 90% removal of the dye in dye-aqueous solution whereas 83% removal in dye-house wastewater. Adsorption capacity of the adsorbent increased during first 10 min and then gradually decreased with time. Breakthrough point was not achieved during the 60 minutes of treatment. Three non-equilibrium models were applied to understand the column bed properties. In the second-step, the adsorbed-dye-molecules in SCB were degraded using an edible fungus *Pleurotus* sp. to obtain a dye free nitrogen-rich bagasse. The fungus treated SCB showed no residual toxicity and a considerable improvement in nitrogen content (from 0.35% to 0.69%) was noticed after the study of elemental profile. New design of the column bed, the process of the chemical functionalization of the SCB, and bioremediation of dye treated bagasse through *Pleurotus* sp. offer a novel solution for efficient and safe disposal of textile dyes.

Keywords: Lanasyne olive; sugarcane-bagasse; *Pleurotus* sp.; remediation; textile dye

NITROGEN MINERALIZATION RATE OF DIFFERENT ORGANIC SOURCES IN INCEPTISOL OF UMIAM, MEGHALAYA

Lumbini Kalita¹, Naorem Janaki Singh²

Department of Soil Science and Agricultural Chemistry, School of Natural Resource Management.

College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University, Imphal, Umroi Road, Umiam - 793103, Meghalaya, India.

* Corresponding author email ID: lumbini_k27@yahoo.com

ABSTRACT

Study of the release pattern of nitrogen from locally available organic sources helps to reduce the chance of occurrence of nitrogen pollution of soil and water and determine the period of peak nitrogen release from organic amendments. These considerations are more relevant in the case of farming in the state of Meghalaya where the farming by default is organic in nature. An incubation study was carried out for a period of 100 days with four organic amendments namely farm yard manure, Poultry manure, Pig manure and Vermicompost and a control (at a rate of 120kg/ hectare) which were evaluated at every 10 Days interval with the aim to quantify the amount of Nitrogen mineralised and the rate of Nitrogen mineralisation at different time intervals. Initially, soil nitrate and ammonium contents were 17.5ppm and 28.0ppm respectively but with advancement in the incubation period, nitrate and ammonium in soil were found to increase. Amendment with pig manure resulted in highest nitrate and ammonium content in soil (39.6ppm and 72.3ppm respectively corresponding to 126.2% and 158.2 % over the initial soil nitrate and ammonium content). Unamended soil recorded the lowest amount of mineralised nitrogen in soil which were only 13.14% and 20.71 % higher over the initial soil nitrate and ammonium content. Change in rate of mineralizable nitrogen (dN/dt) with respect to incubation periods was found to be highest i.e 0.39mg/kg ammonium nitrogen at 60 Days after Incubation and 3.13mg/kg nitrate nitrogen at 10 Days after Incubation. Nitrogen release kinetics were worked out using two models, namely, first order and second order. The first order kinetics model was found to provide best fit equation for predicting nitrogen mineralization rate at any point of time.

Keywords: Nitrogen mineralisation rate, organic inputs, Nitrogen mineralisation kinetics

INTEGRATED NUTRIENT MANAGEMENT IN VEGETABLE CROPS

Yugvinder¹, Kuldeep Kumar², Naveen Kumar¹

1. Ph.D Scholar, Department of Vegetable Science, CCSHAU, Hisar
2. Asst. Scientist, Department of Vegetable Science, CCSHAU, Hisar

*Corresponding author: yugvindergoyat09@gmail.com

ABSTRACT

The agriculture era has been changed from resource degrading to resource conserving technologies and practices which will enable help for increasing crop productivity besides maintaining soil health for future generations. Green revolution besides achieving food security, imposes several threats like deterioration of the soil organic carbon stock, decreasing factor productivity, imbalances in NPK and micronutrient use and disparity in fertilizer consumptions etc. The Integrated Nutrient Management (INM) is a practice where all sources of nutrients namely organic, inorganic (chemical fertilizer) and biofertilizer can be combined for improving soil health, get good quality yield and maintain ecology and environment. It provides an excellent opportunity not only for sustainable soil but enhancing crop productivity also. The INM is the maintenance or adjustment of soil fertility and plant nutrient supply to an optimum level for sustaining the desired crop production through optimization of the benefits from all possible sources of plant nutrients in an integrated manner. The continuous and imbalance use of fertilizers is adversely affecting the sustainability of agricultural production besides causing environmental pollution. The major issue for the sustainable agricultural production will be management of soil organic carbon and rational use of organic inputs such as animal manure, crop residues, green manure, sewage sludge and wastes known as integrated plant resource management. However, since organic manure cannot meet the total nutrient needs of modern agriculture, hence integrated use of nutrients from fertilizers and organic sources will be the need of the time.

Keywords: Soil, NPK, INM, Nutrients, fertilizers, organic, production

NUTRIENT EXPERT®: A TOOL FOR ENHANCING RAINFED COTTON PRODUCTIVITY AND SOIL HEALTH

**Manikandan Angamuthu *, Blaise Desouza, Bhargavi Bussa and Chandrashekhar
Mundafale**

ICAR-Central Institute for Cotton Research, Nagpur-440010, Maharashtra, India

ABSTRACT

Four R concepts is a useful tool for enhancing nutrient use efficiency in several crops. However, this concept was not attempted in cotton so far. Based on the above research gap, on-station trials with 8 treatments with 4 replications were conducted for 2 seasons (2018-2020) with Bt hybrid (BG-II). The main objective is to develop and validate the Nutrient Expert® (NE) for cotton. In addition to the NE, 3 existing fertilizer practices viz., Recommended dose of fertilizer (RDF), Soil test crop response (STCR) and Farmer's fertilizer practice (FFP) and 3 macronutrient (NPK) omissions with ample NPK were tested in rainfed conditions. Leaf NPK were found to be higher in the STCR and NE Vs other treatments. There was a significant yield difference observed and the highest seed cotton yield (SCY) was obtained in NE (3225, 3290) followed by STCR (2941, 2905 kg ha⁻¹) during 2018-19 and 2019-20 respectively. In pooled analysis, SCY was in the order of NE > STCR > RDF > FFP > K⁻ > P⁻ > N⁻. Based on the 2-year trial, we found cotton productivity and nutrient status were higher in NE followed by STCR. Thus, NE is emphasis on balanced nutrition of cotton.

Keywords: *Bt-cotton, Decision support systems, Nutrient Expert, Soil test crop response*

SMART PACKAGING: A PIONEERING TECHNOLOGY IN FOOD PRESERVATION

***Meghana G.N, ¹Harichandana Ponnappalli, ²Arun Kumar. L, ³Dr. Hemalatha. S**

*M.Sc. Scholar, Department of Food Science and Nutrition, College of Community Science, UAS, Dharwad, 580005.

¹Ph.D. Research Scholar, Department of Food Science and Nutrition, College of Community Science, UAS, Dharwad, 580005.

²M.Sc. Scholar, Department of Food Technology, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Himachal Pradesh, 173230.

³Dr. Hemalatha. S, Professor and Head, Food Processing Technology, College of Community Science, UAS, Dharwad, 580005.

**Corresponding author e-mail: gamunagowda15@gmail.com*

ABSTRACT

Smart packaging is a term used to describe product packaging options for a variety of products including food, medicine and many others, that have embedded sensor technology. It is used to extend shelf life, evaluate freshness, display information about quality and enhance product and customer safety. With the use of smart packaging, a product's lifecycle may be tracked and traced. It also analyses and manages the environment inside and outside the container to inform the manufacturer or consumer of the product's current state. These systems are designed to improve packaging capabilities in order to meet growing customer demands, regulatory restrictions, and safety concerns. For brand and retail management as well as the consumer, new packaging and design innovations are anticipated to have substantial practical ramifications. Freshness, compliance, authentication, traceability, increased shelf life, anti-counterfeiting, and brand security are all enhanced by smart packaging. Smart packaging is an all-encompassing packaging solution that proactively detects and reacts to alterations in the environment or other elements that may affect a product. Consequently, technology for food quality improvement and freshness preservation must be developed to keep up with the public's growing interest in food quality and safety.

Keywords: *Smart packaging, sensors, shelf life, traceability.*

EFFECT OF APPLICATION OF FOLIAR NITROGEN AND POTASSIUM APPLICATION ON LEAF NUTRIENT CONTENTS OF FIG (*FICUS CARICA* L.)

Kiran Masta

Department of Soil Science and Water Management,
Dr Y S Parmar University of Horticulture and Forestry Nauni, Solan, Himachal Pradesh-
173230

ABSTRACT

A field experiment was carried out in the model farm of Dr Y S Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh, during the years 2016-17 and 2017-18 to see the effect of foliar nitrogen and potassium applications on leaf nutrient contents of fig. Thirteen treatment combinations were arranged in a randomized block design comprising two levels of nitrogen viz. $N_{0.5}$ (0.5 per cent urea) and $N_{1.0}$ (1.0 per cent urea); two levels of K i.e. K_1 (1.0 per cent KNO_3) and K_2 (2.0 per cent KNO_3) and two application times i.e. September and January, and were replicated thrice. The maximum leaf N was recorded under treatment T_9 (2.71%), whereas, the highest leaf P (0.38%), leaf K (1.22%) and leaf Ca (4.64%) were recorded under treatment T_{13} , comprising nitrogen application through urea spray @ 1.0 per cent and potassium through KNO_3 @ 2.0 per cent twice during September and January. The maximum leaf micronutrient contents were also observed in the same treatment.

Keywords: *Fig, urea, potassium nitrate, foliar spray, leaf nutrient contents*

XYLANASE PRODUCTION USING ALKALO-THERMOPHILIC BACILLUS HALODURANS KR-1 BY SOLID-STATE FERMENTATION

Krityanand Kumar Mahatman¹ and Anil Kumar¹

¹School of Biotechnology, Devi Ahilya University, Indore, Madhya Pradesh

Corresponding address : krityabt@gmail.com

ABSTRACT

Solid state fermentation has been carried out using *Bacillus halodurans* KR-1 for the production of xylanase enzyme. Different agricultural by-products viz. wheat bran, rice bran, wheat straw and soybean meal were tested for xylanase production during solid state fermentation. In the process, among all the agricultural by-products, wheat bran served as best inducer of xylanase. Solid state fermentation broth was incubated up to 120 h. Aliquots were taken out at every 24 h intervals for testing xylanase production. The results indicated maximum production of xylanase after 72 h incubation. Maximum enzyme production was observed with wheat bran moisturized with water (1:1 ratio, w/v). The results indicated drastic decrease in xylanase production on increasing the ratio of tap water. Xylanase production increased on increasing the inoculum size from 5 to 10% and thereafter decreased. Xylanase production was tested at pH of the broth ranging from 5.0 to 12. The results showed maximum xylanase production at pH 9.0. Optimum incubation temperature for maximum xylanase production under solid state fermentation was found to be 40°C. There was about 80% xylanase production at 55°C. Among various moisturizing agents tested for xylanase production, tap water was found to be best in whose presence, more xylanase was produced. Different additives viz. lactose, glucose, maltose, and fructose were tested as carbon source; and potassium nitrate, sodium nitrate, and casein were tested as a nitrogen source. The results showed nearly 80% increase in xylanase production in the presence of fructose followed by lactose and glucose. However, there was no significant change in xylanase production in the presence of various nitrogen sources tested. On five times scale up, increase in xylanase production was not observed linearly. During scale up, fructose was also used as additive. There was about two times increase in enzyme production upon five times scale up.

STUDY OF THE EFFECT OF MAGNESIUM IN ALONG WITH ORGANIC MANURES ON THE GROWTH AND YIELD ATTRIBUTES AND YIELD OF COTTON (*GOSSYPIMUM HIRSUTUM* L.) IN *TYPIC CHROMUSTERT*

K. Rajkumar¹ and P. Saravana Pandian²

¹PhD Scholar, Department of Soils and Environment, Agricultural College and Research Institute, Madurai-625104 (Tamil Nadu), India

²Professor and Head, Department of Soils and Environment, Agricultural College and Research Institute, Madurai-625104 (Tamil Nadu), India

**Corresponding author: rajrakshan12@gmail.com*

ABSTRACT

Magnesium (Mg) serves as the key atom of chlorophyll, where it acts in pigment-protein complexes to gather photons in photosystem I (PSI) and photosystem II (PSII) that are used in large quantity by plants for their growth and reproduction. A field experiment was conducted in a farmer's field located in P.M Pudhur village of Aruppukottai block, Virudhunager District, from 30 Aug 2019 to Jan, 2020 to evaluate the response of cotton to foliar and soil application of magnesium combination with organic manures on the growth and yield attributes and yield of cotton in magnesium deficient soil. The soil was categorized as "Moderately deep clay *Typic Chromustert*, and medium N, P and high K content, in a randomized block design with fifteen treatments and three replications. The results revealed that the application of MgSO_4 at a rate of 50 kg ha^{-1} along with 250 kg vermicompost for 30 days (1:5 ratio) at critical stages of crop growth along with the STCR based N, P_2O_5 and K_2O RDF registered the maximum plant height at all three stages (40,70 and harvest) of crop growth (93.2, 121.6 and 219.5 cm), number of monopodial branches plant^{-1} (32.5), number of sympodial branches plant^{-1} (72.1), numbers of boll plant^{-1} (46.3), boll weight (3.92 g), and seed cotton yield (25.6 q ha^{-1}). This was followed by treatment (T_9) MgSO_4 at a rate of 50 kg ha^{-1} incubated with 500 kg FYM for 30 days (1:10 ratio) along with STCR basis N, P_2O_5 and K_2O RDF and the lowest treatment receiving the recommended dose of N, P_2O_5 and K_2O alone ($80:40:40 \text{ kg ha}^{-1}$). It was revealed that natural chelated fertilizer prepared from MgSO_4 incubated with organic manures for 30 days significantly improved the growth and yield of cotton.

Keywords : Cotton, *Gossypium hirsutum*, Magnesium, Vermicompost, Yield

EFFECT OF GREEN SYNTHESIZED CU NANOPARTICLES PRIMING ON SEED QUALITY IN GREENGRAM

Mamidi Hemalatha and S. S. Chandrashekhar

Department of Seed Science and Technology, University of Agricultural Sciences,
Dharwad, Karnataka-580005

ABSTRACT

The research work deals with investigating the effect of seed priming with green synthesized CuNPs with Tulasi leaves on seed quality attributes of greengram seeds variety DGGV-2. The greengram seeds were primed with different concentrations of green synthesized CuNPs in the ratio of 1:2 for 1 and 3 hrs soaking duration to find best concentration and soaking duration. The experiment consists of nine different treatments which includes T₁: 50 ppm CuNPs for 1 hr, T₂: 50 ppm CuNPs for 3 hr, T₃: 75 ppm CuNPs for 1 hr, T₄: 75 ppm CuNPs for 3 hr, T₅: 100 ppm CuNPs for 1 hr, T₆: 100 ppm CuNPs for 3 hr, T₇: Tulasi leaf extract for 1 hr, T₈: Tulasi leaf extract for 3 hr and T₉: Control. After drying back to 10 per cent moisture content, standard seed germination test was conducted through between paper method. The final count was taken on 7th day and various seed quality parameters were determined. Increasing CuNPs concentration showed reduced effect on seed germination and seedling vigour. Whereas, the soaking duration for 1 hr had shown higher germination per cent for all the treatments when compared to soaking duration for 3 hrs. The lowest concentration of 50 ppm CuNPs soaked for 1 hr exhibited the highest seed germination of 93 per cent accounting for 10 per cent increase in germination over control. The same treatment showed higher shoot length (14.66 cm), root length (16.5 cm), highest seedling vigour index I (2897), seedling vigour index II (23,34.3) and seedling dry weight (25.1 mg).

Keywords: CuNPs (Copper Nanoparticles), Germination per cent, Tulasi leaf extract, Green Synthesis and Seedling Vigour.

INFLUENCE OF INTEGRATED FOLIAR NUTRITION TO COWPEA (*VIGNA UNGUICULATA* (L.) WALP

Kavyashree C¹., S. A. Biradar., V. S. Devaranavadi and S. B. Kalaghatagi

Department of Agronomy, College of Agriculture, Vijayapur - 586101
University of Agricultural Sciences, Dharwad - 580005 (Karnataka), India

*Corresponding author: kavya1341997@gmail.com

ABSTRACT

A field experiment was conducted to study the “Influence of integrated foliar nutrition to cowpea (*Vigna unguiculata* (L.) Walp)” in medium black soils at ICAR - Krishi Vigyan Kendra (KVK) Farm, Vijayapur during summer 2021. The experiment was laid out in Randomized Complete Block Design with nine treatments replicated thrice. The results revealed that, integrated foliar nutrition through different nutrients exerted significant influence on the growth and development parameters, yield attributes, yield, nutrient uptake and economic returns of cowpea. Among them, the treatment RPP + foliar spray of 19:19:19 @ 1% + Vermiwash @ 10% at flower initiation stage and peak flowering stage recorded significantly higher seed yield (1692 kg ha⁻¹), haulm yield (3466 kg ha⁻¹), net returns (₹ 59,398 ha⁻¹) and BC ratio (3.36) compared to all other treatments. Recommended Package of Practices recorded lower seed yield (1197 kg ha⁻¹), haulm yield (2208 kg ha⁻¹), net returns (₹ 36,648 ha⁻¹) and BC ratio (2.58) at flower initiation stage and peak flowering stage over rest of the treatments and lowest was recorded with Recommended Package of Practices.

Keywords: Cowpea, foliar nutrition, yield

ADSORPTION LINKED FUNGAL DEGRADATION PROCESS FOR COMPLETE REMOVAL OF THE TEXTILE DYE LANASYN OLIVE: A LOW COST SOLUTION FOR MITIGATION OF DYE POLLUTION

Samchetshabam Gita^{1,2*}, Satya Prakash Shukla¹

¹Aquatic Environment and Health Management Division, ICAR-Central Institute of Fisheries
Education, Mumbai, Maharashtra, 400061

²College of Fisheries, CAU (I), Tripura, 799210, India

ABSTRACT

Textile dye effluents have been reported for many deleterious effects; therefore, it is essential to remove the dyes from effluents before release into waterbodies. This report describes a two-step process for decolorization of textile dye using sugarcane-bagasse (SCB). The first-step of the process involved functionalization of SCB with alginic acid for packing in column and assessing its performance for adsorptive removal of Lanasyne olive. The designed column showed 90% removal of the dye in dye-aqueous solution whereas 83% removal in dye-house wastewater. Adsorption capacity of the adsorbent increased during first 10 min and then gradually decreased with time. Breakthrough point was not achieved during the 60 minutes of treatment. Three non-equilibrium models were applied to understand the column bed properties. In the second-step, the adsorbed-dye-molecules in SCB were degraded using an edible fungus *Pleurotus* sp. to obtain a dye free nitrogen-rich bagasse. The fungus treated SCB showed no residual toxicity and a considerable improvement in nitrogen content (from 0.35% to 0.69%) was noticed after the study of elemental profile. New design of the column bed, the process of the chemical functionalization of the SCB, and bioremediation of dye treated bagasse through *Pleurotus* sp. offer a novel solution for efficient and safe disposal of textile dyes.

Keywords: Lanasyne olive; sugarcane-bagasse; *Pleurotus* sp.; remediation; textile dye

PERFORMANCE OF MUSCARDINE RESISTANT THERMOTOLERANT BIVOLTINE BREEDS AND MUSCARDINE SUSCEPTIBLE PRODUCTIVE BIVOLTINE BREED OF SILKWORM, *BOMBYX MORI* L FOR COCOON AND REELING PARAMETERS

Chandrakala

Department of Sericulture, College of Agriculture, UAS, GKVK, Bengaluru - 560 065

**Corresponding author: cbgothagi@gmail.com*

ABSTRACT

Three thermotolerant silkworm breeds viz., B1, B4, B8 and one productive CSR₄ breed obtained from CSRTI, Mysore were reared. Parents were reared by following appropriate rearing practices. The fifth instar silkworms were topically inoculated with LC₅₀ dose of muscardine fungus (9.04×10^4 spores / ml) at the rate of 0.5 ml per worm to know their performance under fungal stress. The results revealed that among the parents of the thermotolerant bivoltine silkworm breeds, B1 performed better for cocoon parameters viz., cocoon weight (1.93 g), shell weight (0.47 g) and pupal weight (1.46 g) and silk parameters viz., filament length (1274.69 m), filament weight (0.35 g) and denier (2.50) under normal conditions. However, B4 breed performed better for cocoon parameters viz., cocoon weight (1.51 g), shell weight (0.29 g) and pupal weight (1.22 g) and silk parameters viz., filament length (788.54 m), filament weight (0.24 g) and denier (2.06) under muscardine inoculation. Thus, it could be concluded that thermotolerant bivoltine silkworm breed B4 could be used for further improvement of the breeds for dual stress tolerance.

PHYTOCHEMICAL SCREENING OF PLANT EXTRACT OF BHRINGARAJ (*ECLIPTA ALBA* L.) MORPHOTYPES

Shalini, R. M¹, K. Hima Bindu², V. K. Rao³

¹Department of Plantation, Spices, Medicinal and Aromatic Crops, College of Horticulture,
Bengaluru-560065

²Division of Flower and Medicinal crops, ICAR-IIHR, Bengaluru-560089

³Division of Basic sciences, ICAR-IIHR, Bengaluru-560089

ABSTRACT

Bhringaraj (*Eclipta alba* L.), is one of the important traditional medicinal plants traded in India. It is an annual herb commonly known as false daisy belonging to the family asteraceae, widely distributed in tropical and sub-tropical region of Asia . It is a hepatoprotective medicinal herb reported for its various pharmacological activities like hair growth promotion, antidiabetic, antimicrobial property and anticancerous activity. The estimated annual trade in India is 2000-5000 MT. In the present study 30 morphotypes of Bhringaraj were screened for phytochemical constituents such as wedelolactone, total phenolic (Singleton and Rossi, 1965) and total flavanoid content (Chun *et al.*, 2003) analysed from methanolic extract of herb. Wedelolactone is the principle compound present in bhringaraj having hepatoprotective property and is estimated by HPLC protocol. Among 30 morphotypes accession IIHR 3 recorded the highest wedelolactone content (0.6% w/w) whereas, accession IIHR 36 recorded the lowest content (0.0006% w/w). Among the morphotypes, the highest phenolic content was recorded in accession IIHR 3 (39.04 mg/g) while the lowest phenol content was recorded in the accession IIHR 37 (8.13 mg/g). The highest flavanoid content was recorded in accession IIHR 46 (16.79 mg/g) while the lowest content was recorded in accession IIHR 37 (5.86 mg/g).

Keywords: *Bhringaraj, morphotypes, accession, wedelolactone*

**AAFS
2022**

THEME

08

**Global and
Regional
Policy
Transformation**

A STUDY ON FOOD HABITS AMONG THE ADOLESCENT GIRLS OF VIJAYAPURA DISTRICT OF KARNATAKA

¹Shruti Nayak., ^{*2}Prashanth S. J., ¹Ashwini, A., and ¹Savita V. Jammanakatti.

¹ Research Scholar, Dept. of Food Processing & Nutrition, Karnataka State Akkamahadevi Women's University, Vijayapura – 586 108, Karnataka, India

² Associate Professor, Dept. of Food Processing & Nutrition, Karnataka State Akkamahadevi Women's University, Vijayapura – 586 108, Karnataka, India

ABSTRACT

The present study was conducted to know the food habits among urban and rural adolescent girls of Vijayapura district of Karnataka. Samples of 100 adolescent girls between the age group of 14-17 years were selected for the study. The self-structured questionnaire was used for collection of data regarding food habits among adolescent girls. The results revealed that, majority of the girls were ova-vegetarian (49%), majority of the girls skip the meals everyday (69%) because of lack of time and majority of the adolescent girls consume bakery products (72%) once in a week. It was also found that, less number of respondents take nutritional supplements (27%) once in a week. As adolescence is the growing age and the body need more nourishment. Skipping of meals every day may hamper their growth and development as the body is at the peak of growth and development. Adolescence is the age of puberty in which, individual can grow to maximum. So adolescents can be given awareness regarding the importance of food in growth and development and complications of skipping of meals or lower intake of food.

Keywords: Food habits, adolescent girls, everyday, monthly

DETERMINANTS OF HOUSEHOLD ENERGY CONSUMPTION PATTERNS

¹Adhi Sri latha, ²Harichandana Ponnappalli and ³Dr. Suma Hasalkar

¹Adhi Srilatha, Ph.D Scholar, Department of Family Resource Management, College of Community science, UAS, Dharwad, 580005

²Harichandana Ponnappalli, Ph.D Scholar, Department of Food Science and Nutrition, College of Community science, UAS, Dharwad, 580005

³Dr. Suma Hasalkar, Rtd. Professor and Head, Department of Family Resource Management, College of Community science, UAS, Dharwad, 580005

Corresponding author e-mail: adisrilatha20@gmail.com

ABSTRACT

Energy is considered as the prime mover of region's development. India has more villages and hence rural development is nation's development. The word energy can be paraphrased as "the potential for causing changes" and therefore one can say that energy is the cause of any change. More than half of global population are lacking clean cooking facilities. Over 2/3rd of the population continues to use firewood, agricultural residues, dung cakes etc. for cooking and other household purposes which is associated with the deterioration of human health and over 800 million people are affected by indoor air pollution of which women are more likely to develop health conditions due to their exposure to indoor air pollutants. There are differences in rural household energy consumption, which may vary according to the location of the households. The primary objective for deploying renewable energy in India is to advance economic development, improve energy security, access to clean energy and mitigate climate change. Sustainable development is possible by use of sustainable energy and by ensuring access to affordable, reliable, sustainable and modern energy for citizens. Hence, there is importance of creating different energy options when planning and implementing a sustainable energy policy for a region.

Keywords: *Energy, Biomass fuel, Indoor air pollution, Sustainable development.*

Transforming Villages. Ensuring Prosperity.



Climate Action



Rural Infrastructure



Watershed
Development



Farmer Collectives



Women
Empowerment



Tribal
Development



Financial Inclusion



NABARD

Development Bank of the Nation



978-93-93878-79-3

www.nabard.org



/nabardonline