



Global Reach

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Intensification of Coffee Agroforestry System Influences CLR Infections	Gerba Daba Hirpa, JUCAVM



Presenter Name: Aden Abdurahman Shibru

Title of Presentation: *Past and Future Land-use Change Implication on Biodiversity: The Case of Koore's Agricultural Landscape of Southern Ethiopia*

Thematic Area: Agri Business and Economics

Abstract: Sustained mankind's welfare depends on the wise use of environmental assets. But, the ongoing land-use change challenges its sustainability. Thus, this study intended to quantify the past and future land-use change trend focusing on its biodiversity implication in Koore's agricultural landscape of Southern Ethiopia. To quantify the change trends, ArcGIS 10.5 and ERDAS imagine 2015 were applied. A CA-Markov model was used for land-use change prediction. Relative Importance Index was used to identify major drivers of the change. The result of the study showed agroforestry, built-up and cultivation land raised by 192%, 152% and 18% at the expense of natural environment. Population growth and agricultural expansion are among the leading land-use change drivers. Change modeling results revealed a continued increment of anthropogenic land-use classes. This has adverse effect on biodiversity of the landscape. Thus, it needs a proper land-use plan.

Key Words: Land-use, Biodiversity, Koore

Presenter Name: Aruna Prabha S

Title of Presentation: *The Changing Scenario of India's International Coffee Trade*

Thematic Area: Agri Business and Economics

Abstract: India faces high threat as it is losing its export competitiveness due to poor value addition in the plantation commodities. Among the major plantation crops in India, coffee is highly dependent on trade where more than 60-70 per cent is exported to other countries. But, there is a decline in share of Indian coffee exports to world from 5.40 per cent in 2017 to 4.64 per cent in 2019. The export of coffee from India during the last 20 years had more fluctuations. The study examined the changing scenario of India's coffee exports. In this context, the objective of the study is to determine the trend, direction of trade and instability index of coffee exports during 2001-2020. To estimate the trend in quantity of coffee exports, Compound Annual Growth Rate (CAGR) is estimated. The CAGR of Indian coffee exports is observed at 3.51 per cent annum at one per cent level of significance. Direction of coffee trade was studied by examining the Indian coffee exports through Markov chain analysis. Countries like Italy, Germany, Russian Federation, Belgium, and Slovenia are the major destinations of Indian Coffee. Italy remained as the highly stable market among the major importers of Indian coffee as it possessed highest probability of retention 1 viz., Italy retained its export share over the study period was about 100 per cent. Other countries like Slovenia, Germany and Russia were the most loyal countries among the importers of Indian coffee. The high retention of imports of Indian coffee was due to high consumption level over the study period. As a result, it leads to existence of high demand for Indian coffee in the overseas market. To examine the stability of coffee exports from India to other countries, instability index was calculated. Italy was the most stable importer with the coefficient of variation of 22.76 per cent and instability index of 25.81 per cent. Belgium, Russia, Slovenia, and Ukraine were the other stable importers of coffee from India. The largest importers remained as most stable importers of Indian coffee. Poland was highly unstable importer with the coefficient of variation of 100.21 per cent and instability index of 254.35 per cent. Australia, USA and Jordan are the other unstable importers of Indian coffee.

Presenter Name: Chanuka Swarnathilake

Title of Presentation: *Sustainability in the Context of Beef Farming in Atlantic Canada*

Thematic Area: Agri Business and Economics

Abstract: Atlantic Canada has favorable conditions for beef farming: low land costs; plenty of access to grasslands. However, producers face challenges such as high resource requirements, causing negative environmental impacts. This study was initiated to assess the potential for increasing sustainable beef production in the region by identifying factors constraining competitiveness. A meta-analysis was executed by Random Effect Models. In late 2021, a survey of beef producers was conducted; n=114. Results reveal that use of research outcomes, participation in training, improving genetics, and creating a low-stress environment for animals as significant factors ($p < 0.05$) for the success of beef farming. It is recommended to educate farmers on sustainable farming practices and disseminate research outcomes with them on animal welfare, feed efficiency, and breeding through conferences, workshops, and training.

Presenter Name: Decong Tang

Title of Presentation: *Tourism Circular Economy: Identification and Measurement of Tourism Industry Ecologization*

Thematic Area: Agri Business and Economics

Abstract: Environmental problems caused by the excessive pursuit of tourism economic are becoming increasingly prominent. However, previous studies regard the sustainable process of the tourism industry as a linear process, which usually leads to a particular gap between the sustainable assessment of the tourism industry and the reality. This study notes this research gap, refines the concept of tourism industry ecologization through Circular Economy theory and matches the DPSIR model to propose an assessment framework of tourism industry ecologization. The level of tourism industry ecologization in China from 2011 to 2019 is assessed through the entropy-weighted-TOPSIS method. Our research results indicate that the application of this model can better evaluate the tourism industry ecologization level to a certain extent. Based on results, we put forward relevant policy suggestions to improve the ecological development of the tourism industry from micro, medium and macro perspectives.

Presenter Name: Fu Cheng

Title of Presentation: *Study on Low-carbon Management of Tea Plantation Based on Value Stream Analysis of Typical Tea Areas in Fujian*

Thematic Area: Agri Business and Economics

Abstract: In this study, for exploring the combination of low-carbon management behaviors in tea plantations, six tea plantations with different management types (pure chemical fertilizer, pure organic fertilizer, no fertilizer, no pesticide spraying, no pruning, intercropping other plant) were selected as research cases in Fujian Province, through value stream analysis method to analyze the correlation between value flow and soil carbon content in the links of tea plantations management. The results showed as follows: (1) For the goal of low-carbon management: applying chemical and organic fertilizers, pruning branches, applying chemical and non-chemical pesticides, weeding by machine, picking tea leaves by hand and mechanical methods. (2) For the goal of economic management: no fertilization, no pruning, no pesticide spraying, weeding by manual and mechanical means, picking tea leaves by hand. (3) For different goals, the combinations of tea plantations management behaviors are different.

Presenter Name: Jagadeshwaran P

Title of Presentation: *Modeling Direct Cash Transfer to Farmers in a CGE Framework – India*

Thematic Area: Agri Business and Economics

Abstract: Government of India had taken several policy measures and subsidy programs for the farmers to reduce their cost of production, risk mitigation during natural calamities and also provides income support to the farmers through direct benefit transfer. With increase in population and fragmentation of land area under cultivation there requires a huge capital investment to adopt advanced production technologies to meet the global food demand. Based on the CGE modeling the results indicate that there is a positive impact in the agriculture sector as well as to the economy. Further there is an increase in income level of farm households and also change in the consumption pattern. However, the changes are very minimum but with the income support there is a lesser production cost incurred by the households. The unemployment level has reduced slightly with increase in the cash transfer as the demand for factor labour change in agriculture as well as in the service sector.

Presenter Name: Keerthika B

Title of Presentation: *Export Performance of Natural Honey from India- An Analysis of Sweet Revolution*

Thematic Area: Agri Business and Economics

Abstract: Sweet revolution (2016), which is aimed at promoting apiculture, to accelerate the production of quality honey and other related products. The objectives of the study is to assess the export performance of the natural honey trade from India which was estimated using different statistical tools like CAGR, Cuddy-Della Index, Markov-Chain Analysis and Balassa's Index. The results of the study revealed that CAGR was increased by 13.86 % for production and 14.68 % for export quantity during the study period. There was an overall decrease in instability of production and export of natural honey for both production and export quantity with 20.91 and 21.60, respectively. Markov-Chain analysis showed that the USA is the large market that captures the maximum of honey export from India. The revealed comparative advantage for 2020 was 1.82 but it was 0.03 during 2015 (before Sweet Revolution) which indicates an advantage of natural honey export from India after Sweet Revolution.

Presenter Name: Nithya Kalpana E

Title of Presentation: *Dynamics of Domestic and International Coconut Prices and Implications on Coconut Production in India*

Thematic Area: Agri Business and Economics

Abstract: India is the largest coconut producing country next to Indonesia. The country's coconut production have slightly improved. Of total area and production, 89.1% is accounted from southern states of India. Almost 70% of the total produced nuts are consumed directly, rest is used by industries for value addition like dried coconut, virgin coconut oil. The present study will be undertaken with the objective to analyze the price formation and transmission between Indian and international markets, besides studying the supply response of coconut. The Error Correction Model, to trace the short-term and long-term disequilibrium and its adjustment. The preliminary results revealed that there is a significant increase in export price of vegetable oils. In order to mitigate price shocks supportive measures were initiated by government and CDB by market intervening activity. The government has initiated direct procurement of copra to stabilize market price expecting to reduce coconut farmers income loss

Presenter Name: Sudha Ramasamy

Title of Presentation: *Impact of Microfinance on Income, Efficiency & Women Empowerment of Small & Marginal Farmers in South India*

Thematic Area: Agri Business and Economics

Abstract: The sample size was 300 respondents. Findings show that a significant relationship between access to credit & farm income production efficiency & women empowerment. From the MNL, education has positively & age has negatively related to access to BL-SHG micro-finance. Farmer's regular income & agricultural training have a significant relationship with SHG membership. From the DID model, the income progression was higher in both tribal & non-tribal SHG members compared with non-members in the study area. The stochastic frontier production function shows that the farmers were small-scale & resource-poor, but they were less fairly efficient in the use of their resources & an increase in the use of any resources would bring more than a proportionate increase in their output. The A-WEAI indicated that SHG group membership, credit & training program contributed the women's empowerment. Constraints like non-follow-up practices from government officials, & repayment operations in banks.

Presenter Name: Soujanya C. K.

Title of Presentation: *Changing Pattern in Coffee Production in Five Major Coffee-Producing Countries and India: An Economic Analysis*

Thematic Area: Agri Business and Economics

Abstract: Coffee is the second largest traded commodity after oil. To assess the changes in growth of coffee with respect to area, production and productivity the trend, instability and decomposition of coffee production in five major countries and India was collected. Time series data from 1961-2020 was split into pre and post liberalization periods. The compound growth rate in area, production and productivity showed a positive significant growth rate in Honduras, Indonesia and Vietnam from pre to post-liberalization period whereas others showed mixed rates. Area, production and productivity remained highly unstable in pre-liberalization period in most of the countries even though they started to attain medium instability in post-liberalization. Besides, the change in mean area had negative effect on production in Brazil and Columbia whereas others had a positive effect on production. The change in mean yield had a positive impact on production in all the countries except Indonesia.

Presenter Name: Vivek G

Title of Presentation: *Improving Livelihood of Farmers Through Smart Farming*

Thematic Area: Agri Business and Economics

Abstract: The way farms are handled and managed would likely change as an outcome of application of big data in agriculture. All agricultural devices and equipment can be linked together using this technology, aiding to make informed decisions concerning irrigation and application of fertilizer. Use of smart sensors in smart irrigation could help in monitoring water levels based on crop intake and also aids in assessing the soil characteristics measurement. The objective of study reveals about the farmers livelihood changes through smart farming. The result of the study depicted that farmers application of smart farming and Internet on Things (IoT) would be reliable, robust, cost-effective and scalable. The impact of study revealed about Smart decision support system (SDSS) would support farmers in making informed decisions on selecting potential crops and cultivating them at right time that maximize their profits, thereby improving their livelihood.

Presenter Name: Vetri Selvi B

Title of Presentation: COVID-19 Pandemic: Lockdown Impacts on Agriculture and Farmers' Livelihood in the Western Zone of Tamil Nadu, India

Thematic Area: Agri Business and Economics

Abstract: The current pandemic COVID-19 had wreaked havoc on global economic activities and supply networks. Of the various sectors and work groups, the impact was more pronounced and realized by the agricultural laborers and farmers who are engaged in the primary production and marketing of farm produces. The objective of the study was to analyze the impact of COVID-19 on the agricultural sector in the western region of Tamil Nadu. A total of 210 sample respondents and six perishable crops were selected for the study. By employing yield gap analysis, resource use efficiency and percentage analysis it could be interpreted that there was a negative impact of COVID-19 on the production, post-production and marketing of highly perishable commodities and also the earnings, expenditure and savings profile of the farmers growing perishable commodities in the study area.

Key words: COVID-19, Yield Gap, Horticultural crops, Post-production, Marketing.

Presenter Name: Chandrakala

Title of Presentation: Per-se Performance of Six Generations of Crosses Between Muscardine Resistant Thermotolerant Bivoltine Breeds and Muscardine Susceptible Productive Bivoltine Breed of Silkworm

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: Three thermotolerant bivoltine breeds B1, B4 and B8 crossed with a productive but muscardine susceptible bivoltine breed CSR4 were used to raise F1 and F2 generation layings. Also, BC1 and BC2 generations were obtained by crossing F1's with tolerant parent and susceptible parents, respectively. All these six generations viz., P1, P2, F1, F2, BC1 and BC2 were reared at once. The thermotolerant bivoltine breeds and their crosses were inoculated with 9×10^4 spores /ml of *Beauveria bassiana* @ 0.5 ml per silkworm. The results revealed that the thermotolerant bivoltine silkworm breed B4 and its crosses performed significantly better than others for all the five parameters studied, viz., larval weight (g/ worm), larval mortality (%), effective rate of rearing (%), cocoon yield by number (per 10,000 worms) and weight (Kg/10,000 worms) when inoculated with the fungus, while the next better breed was B1 and its crosses. This study was conducted to understand the genetics of muscardine disease resistance by analysing the segregating generation of F1 and F2 of promising thermotolerant bivoltine hybrids also processing muscardine tolerance, to further proceed towards evolving suitable bivoltine hybrids. Six generation mean analysis is under progress.

Presenter Name: Fisayo Akinyemi

Title of Presentation: Effects of Brown Seaweed on Growth Performance and Blood Parameters of Heat-Stressed Chickens

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: Given the potential benefits of seaweed, we aimed to determine the efficacy of brown seaweed meal (SWM) and extract (SWE) on growth performance, blood biochemistry, immunoglobulins (IgG and IgM), and antioxidant capacity of chickens challenged with HS. On day 28, two male birds/cage were euthanized for measuring blood parameters. Data were analyzed as a 4×2 factorial analysis of variance using GLM of Minitab LLC, (2019) software. 2% SWM inclusion significantly increased ($P < 0.05$) improved broilers growth performance. HS significantly reduced ($P < 0.05$) feed intake, furthered increased ($P < 0.05$) the bird's RT, plasma concentrations of sodium, chloride, glucose, amylase, uric acid, IgM and IgG concentrations and antioxidant status. 1 ml SWE decreased plasma ALT and increased lipase activity. Our results imply that the dietary supplementation of brown seaweed potentially mitigated the negative effects of HS by improving the plasma enzyme activities of heat-stressed birds.

Presenter Name: Georgia Lewis

Title of Presentation: *Estimating Environmental Performance of Dehydrated Poultry Manure Production Using a Life Cycle Assessment Approach*

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: As Canada commits to climate goals, an improved understanding of the environmental impacts associated with the production of crop nutrient inputs is required to decrease agriculture's environmental impacts. There is a growing demand for nutrient sources that are an alternative to manufactured mineral fertilizers. Dehydrated poultry manure (DPM) is an alternative crop nutrient input derived from conventional poultry production that is commonly used in organic agriculture. Dehydration of the manure reduces transportation costs, and pelletization allows easier handling and application. While the environmental metrics of manufactured mineral fertilizers are relatively well documented, an analysis of environmental metrics associated with DPM manufacture has not been conducted. This research aims to estimate the environmental performance metrics of DPM production in Eastern Canada through a life cycle assessment (LCA) approach, emphasizing GHG emissions, energy use, and eutrophication.

Presenter Name: Krishna Kumar S

Title of Presentation: *Volatile Chemical Signals Underlying the Host Plant Preferences of *Earias vittella* in *Abelmoschus* spp.*

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: Chemical signals are the prime communication strategies of insects. Understanding this interaction may lead to develop impeccable bait traps. Incessant, our current study comprehended choice and no-choice assay (CA&NCA) as well as Y-tube olfactometer bioassays of headspace volatiles to determine which *Abelmoschus* species the okra shoot and fruit borer (OSFB), *Earias vittella*, preferred. The results revealed that among the selected genotypes, cultivating variety of okra, Arka anamika showed a high susceptibility by having more no. of eggs laid and a significant positive behavioral response ($P < 0.01$). Whereas, *Abelmoschus tuberculatus* exhibited extreme resistance by possessing less no. of eggs laid (CA: $\mu=7.0$; NCA: $\mu=9.06$) and a significant negative behavioral response ($P < 0.0001$). GC-EAD was also used to evaluate the screening genotype headspace volatiles, and the results showed that there were 17 and 13 principal volatile compounds in Arka anamika and *A. tuberculatus*, respectively.

Presenter Name: Kibreab Yosefe

Title of Presentation: *Effects of Feeding Avena Sativa Based Diet on Growth Performance of Bonga Sheep*

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: The objective of the experiment was to evaluate feeding *Avena sativa* based diet with/without Concentrate mix effect on feed intake and weight gain of yearling Bonga Sheep. The research done using RCBD design with seven replications. Each lamb based on diet feeding group was :T1=Silage of 48.5% *Avena sativa* 5527+48.5% *Pennisetum purpureum*+3% molasses; T2=300g Concentrate ; T3=*Avena sativa* 80AB2806 hey. T4=*Avena Sativa* 5527 hey ;T5=*Avena Sativa* 5527 hey +300g Concentrate ;T6=*Avena Sativa* 80AB2806 hey + 300g Concentrate. T7=Silage of 48.5% *Avena sativa*+48.5% *Pennisetum purpureum* + 300g +Concentrate+3% molasses.All treatments have 1% salt+1% limestone.T5 groups highest($p<0.0001$) total dry matter intake (1062.34 g/day/head), crude protein intake (157.44 g/day/head), metabolizable energy intake(11.08 MJ ME/kg DM).T5 treatment groups average daily weight gain (115g/day/Sheep), dressing percentage using empty body weight (51.58%). It is concluded that T5 is optimum and recommended.

Presenter Name: Nicolas Argenta

Title of Presentation: *Adaptation of Mucilaginibacter Rubeus P2 Isolated from a Gold and Copper Mine to a Heavy Metal Contaminated Environment*

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: Crustacean fishery is an established activity but shell diseases are an impediment to their sustainability and growth. The most economically significant shell diseases of crustaceans are impoundment and epizootic shell disease, that occur in the American lobster. The black spot disease that affects different crustaceans also have economical effects. To manage these diseases, it is necessary to understand the host-pathogen relationships. However, little is known about the microorganisms involved in these diseases or the defense mechanisms of crustaceans against these infections in tissues/organs of immune interest. Therefore, this project objective is to identify host-pathogen interactions that lead to the development of shell disease lesions in *Homarus americanus* and *Cancer borealis* through microbiome and whole transcriptome analysis. This project may reveal microbial and immune markers which can be used for the development of novel strategies in lobster infectious disease management.

Presenter Name: Li Yuanping

Title of Presentation: *Adaptation of Mucilaginibacter Rubeus P2 Isolated from a Gold and Copper Mine to a Heavy Metal Contaminated Environment*

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: Heavy metal pollution has become a serious problem that harms the development of ecosystem. Microorganisms, as the most important component in many ecosystems, are known to play a vital role in the biogeochemical cycle of heavy metals. It is of great significance to reveal the adaptive evolutionary mechanisms of specific microorganisms to heavy metals contaminated environment, which could support the study of biological evolution in extreme environments, as well as enrich strain pool for bioremediation of heavy metal pollution. In present study, *M. rubeus* P2 with a high heavy metal(loid)s resistance were isolated from a Zijin gold and copper mine was isolated: 1) Spectroscopic analysis was employed for the isolation and characterization of EPS secreted by strain P2, which confirmed that adsorption by EPS enhanced adaptation to heavy metal polluted environments. 2) Multi-omic analysis, demonstrated that the abundance of heavy metal resistance determinants and genomic plasticity plays an important role in bacterial adapt to heavy metal toxicity. 3) Two novel genes, *me1* and *me2*, which are associated with antimony and arsenic resistance for the first time.

Presenter Name: Waseyehun Assen

Title of Presentation: *Exploring the Potential of Locally Grown Amaranthus Caudatus Grain Seed as Poultry Feeds in Ethiopia*

Thematic Area: Animal Science, Aquaculture and Plant Protection

Abstract: In poultry feed, energy and protein source ingredients are two of the most expensive inputs that are included in large quantities. Due to this poultry industries are faced with a major problem of limited energy and protein sources. Moreover, change in climatic conditions globally have resulted in a scarcity in the market and instability in prices which makes it necessary to consider unconventional ingredients in feed formulation. Amaranth is one of the identified crops that might address the aforementioned problems. This research proposal will evaluate the grain yield potential of a crop and the effect of the inclusion of different levels of amaranth grains on the production of layers and broilers. The result of this study is expected to lead to cheap and sustainable feed ingredients to reduce the cost of poultry feed, while at the same time it contributing to the food and nutritional security of the society through the use of locally available none conventional feed resources

Presenter Name: Ashebir Mekonnen

Title of Presentation: Quantifying Soybean Yield Gap Using CROPGRO-Soybean Model in Ethiopia

Thematic Area: Crop Production

Abstract: CROPGRO-soybean model is an important tool to estimate crop productivity and yield gap. The objectives are to evaluate the performance of the model and to quantify potential yield, water limited yield, and yield gaps of soybean in southwestern Ethiopia. Model calibration and evaluation were done with a field experiment conducted on sowing dates of Clark 63k and SCS-1 soybean varieties in 2019 and 2020. The highest simulated potential yield and water limited yield for the dominantly cultivated soybean variety, Clark 63k, were 4055 kg ha⁻¹ and 3939 kg ha⁻¹, respectively. The yield gap due to water limits ranged from 2 to 56%. Poor distribution of rainfall and low night temperature during the reproductive growth stages of the crop have been found to be the major causes for large yield gap percentage in the target area. In conclusion, the CROPGRO-soybean model can be a useful tool for quantifying the yield gaps, and to plan appropriate strategies for better production of soybean in Ethiopia.

Presenter Name: Babli

Title of Presentation: Studies on Some Aspects of Alternaria Blight of Rapeseed-Mustard with Special Reference to its Management

Thematic Area: Crop Production

Abstract: Alternaria blight disease of mustard caused by *Alternaria brassicae* (Berk.) Sacc. has been reported from all over the world and is one among the important diseases of rapeseed- mustard causing severe yield losses with no proven source of transferable resistance in any of the hosts. The disease appears as black spots that enlarge and develop into prominent round spots with concentric rings, later coalescing to form large patches on most plant parts. The pathogen is greatly influenced by weather with the highest disease incidence reported in wet seasons and in areas with relatively high rainfall. Field experiments were conducted, to survey three districts of Madhya Pradesh to record percent disease index among them minimum disease intensity was recorded in Gwalior districts followed by Bhind and Morena, to identify eco-friendly products and fungicides for the management of Alternaria blight, biochemical analysis of diseased mustard to study resistance governing factors to this disease.

Presenter Name: Berhanu Bilate

Title of Presentation: G x E & Yield Stability of Cassava Genotypes Using AMMI and GGE Biplot Analysis

Thematic Area: Crop Production

Abstract: Twenty-five cassava genotypes were evaluated to investigate G x E and yield stability in six environments. It was designed as a 5x5 simple lattice with 2 replications. The ANOVA revealed that GxE had a significant ($P < 0.001$) influence on root yield. The genotype by environment (G x E) interaction showed a 61.36% contribution to the total treatment variation, while the E and G effects explained 28.16% and 10.48%, respectively. The GGE biplot showed that the 6 environments fitted into 3 mega-environments. Tarcha was the ideal environment, while Jimma and Areka were undesirable environments for cassava commercial production. G10 was the ideal and overall winning genotype. Moreover, G10 and G14 were identified as being the most stable, with a higher root yield than the grand mean. The generated information indicated G10 and G14 to be promising candidates; hence, they could be used for future breeding work, i.e., for inclusion in a variety of development programs.

Presenter Name: B R Chandana

Title of Presentation: *Prediction of Frequency of Transgressive RILs in Horse Gram*

Thematic Area: Crop Production

Abstract: Early generation (F2:3) prediction of frequency of transgressive RILs that could be derived from advanced generations of crosses allows increased allocation of resources only to a few promising crosses. We predicted the frequency of transgressive RILs from two horse gram crosses for primary branches plant-1, pods plant-1, pod weight plant-1 and grain weight plant-1 based on mid-parental value, additive genetic effects and variances estimated from trait means of parents, their F2 and F2:3 generations. The frequencies of transgressive RILs predicted from IC361290 × Palem1 were higher than those predicted from HPKM320 × CRIDA18-R for three of the four traits. The minimum population size required to recover transgressive RILs predicted from IC361290 × Palem1 was relatively smaller than that from HPKM320 × CRIDA18-R. We believe that the objective criterion used in our study is handy in predicting transgressive RILs in early segregating populations derived from a few promising crosses.

Presenter Name: Deepika

Title of Presentation: *Morphological Characterization of land races of rice (Oryza sativa L.)*

Thematic Area: Crop Production

Abstract: Recent agreements within the framework of the World Trade Organization have sparked an increase in interest in the descriptive identification of plant varieties in the context of intellectual property rights. The requirements of these activities vary, for example, the varietal registration process requires that a description of a newly bred variety be produced and compared to all existing varieties of common knowledge. 31 landraces (29) including checks (2) collected from OFRC, KSNUAHS, Navile, Shivamogga were utilized for the present study. These landraces were raised in RCBD replicated thrice and evaluated for 38 morphological traits during Kharif 2021. The local landraces exhibited sufficient genetic variation for most of the traits. Out of 38 descriptors studied, five characters (Leaf collar, male sterility, leaf ligule, leaf auricle & shape of ligule) were found monomorphic, while rest of the characters showed polymorphic variations among the landraces. The genetic potential of the landraces for the desired traits can be utilized in hybridization programme to achieve promising genotypes.

Presenter Name: Gundlapalli Soumith

Title of Presentation: *Study of DUS Characterization and Diversity Analysis in Advanced Breeding Lines*

Thematic Area: Crop Production

Abstract: The present investigation entitled “Study of DUS characterization and Diversity Analysis in Advanced Breeding Lines derived from” targeted the evaluation of 120 chickpea genotypes for various qualitative and quantitative characters at the plant and seed level. Highly significant variability was observed and 120 genotypes were grouped accordingly in different categories as per DUS descriptor. Desi and Kabuli were distinct with some characters but some deviations such as Dindori in Desi and RVKG-2K21 in Kabuli were observed due to crosses in between Desi and Kabuli genotypes. All the genotypes were grouped in eleven clusters. Cluster II is with the highest number of genotypes 30 and cluster XI with lowest number of genotypes. So, a recombination breeding programme among the genotypes of these clusters will be more useful and results in rapid increase in the seed yield through high heterosis manifestation.

Presenter Name: Poonam Rajpoot

Title of Presentation: *Screening of Pearl Millet Germplasm Lines on the Basis of Disease Indexing and Gene-Specific SSR Markers Against Blast*

Thematic Area: Crop Production

Abstract: This study was conducted with the aim of identifying blast resistance genotypes based on field and molecular data generated from gene-specific SSR molecular markers. In the current research, a total number of 75 pearl millet germplasm lines have been screened against blast. In field screening, out of 75 germplasm lines 12 viz., IP-310, IP-240, IP-317, IP-126, IP-205, IP-102, IP-247, IP-386, IP-338, IP-208, IP-101 and IP-210 have been found highly resistance, 39 were resistance, 8 moderate resistance and rest susceptible. In molecular analysis, all the genotypes were grouped into 9 major clusters and among them clusters 3, 6 and 9 are grouped with highly resistant genes for blast disease. Cluster 1, 4, 5 and 8 is grouped with moderately resistant genes. The resistant germplasm lines identified in this experiment may be used as a blast resistance gene donor to develop an improved genotype that acts as a fence against the spread of the disease in new areas, consequently enhancing productivity.

Presenter Name: Poornima Sharma

Title of Presentation: *Fertilization Impact on Microbial Population, Soil Fertility, Grain Yield and Nutrient use Efficiency of Mustard in Alluvial Soil of Gwalior*

Thematic Area: Crop Production

Abstract: Objectives: 1. Fertilization impact on soil microbial population.
2. Effect on yield and yield attributes of mustard crop.
3. Effect on soil fertility and physical and chemical properties of soil.

Methods: Culturing microbes on different media by spread plate method.

Analyzing soil parameters by Referred methods of soil testing .

Counting all the yield attributes on 30, 60, 90 and 120 DAS.

RESULTS: Microbial population have different affect by soil fertilizer treatments, bacteria found more in phosphorus applied trials and fungi found more in Vermicompost and very less in fym trials.

Plant yield attributes generally showed increasing trend with nutrient grading and the 75% graded nutrient gave most positive results.

Ph, EC and OC differ significantly with treatments.

Presenter Name: Tejpal Sharma

Title of Presentation: *Non-GM Cotton Cultivars Response Studies to Varying Nitrogen Levels Under Rain-Fed Organic Conditions*

Thematic Area: Crop Production

Abstract: The emergence of global environmental issues, lack of availability to high-quality non-Bt seeds, increased cost of nitrogen have spurred an interest to carry out an experiment with an objective to study the effect of varying levels of nitrogen through vermicompost on yield, fiber quality, nutrient content and soil fertility under rainfed conditions in vertisols. The results revealed that among both the Gossypium species, G. arboreum performed better as compared to G. hirsutum under organic rainfed conditions. At different nitrogen levels, among different cultivars Av-C14 (G. arboruem) performed better in terms of growth, yield, sustainability as well as the organic fertilization has also improved the soil fertility and exhibited better nutritional and fiber quality.

Presenter Name: Eshetu Bekele

Title of Presentation: *Spatiotemporal Analysis of Climate Extreme Events in Ilubator Zone*

Thematic Area: Environmental Science and Engineering

Abstract: Climate analysis is vital for natural resources management and food risk assessment. The study explored the spatiotemporal study of climate extremes in Ilubabor zone. 30 years climate data were subjected to Rclimact2 for data quality checkup. MK and Sen's Slope estimator were applied to see the magnitude of extreme climate indices. The result revealed R95p and CWD showed significant decreasing and increasing patterns respectively at ($P < 0.05$) while TN90p, TXn and TNn have shown significant increasing trend at ($P < 0.05$). In conclusion warm extremes are strongly increasing while the rainfall extremes were found highly fluctuating in the last three decades. The warming climate and unreliable rainfall has placed local livelihoods at a cross roads in between a warming planet and changing lifestyles in Ilubabor zone.

Keywords: Rclimact2, spatiotemporal variation, temperature, rainfall

Presenter Name: Abebayehu Aticho

Title of Presentation: *Urban Expansion and Nature Protection Dilemma in Fast Growing Cities of Ethiopia, Jimma*

Thematic Area: Environmental Science and Engineering

Abstract: Urbanization threatens biodiversity mostly in developing nations. Here we quantified Jimma city expansion in the past 35 years, predicted change for 2070, and identified conservation priority sites. Satellite images of two periods were used to analyze land cover and quantify changes, Markov chain model was used to predict changes over 50 years, and multi-criteria was used to identify priority areas. Our results showed in the past three decades, built-up areas were expanded by sevenfold while cropland by 34%. However, forests declined by 39%, grassland by 20%, and wetland by 28%. Our projection revealed built-up areas would further increase fourfold in 50 years whereas open water, wetland, natural forest, and cropland would decline by 81%, 40%, 42%, and 55% respectively. Our study showed, 28% of areas of Jimma city vicinity are biodiversity conservation priorities. Hence, to build resilient and sustainable urban centers, developing nations should integrate urban and nature conservation.

Presenter Name: Karthikeyan Ganesan

Title of Presentation: *Vetiver Floating Wetlands (VFWs) in Wastewater Treatment*

Thematic Area: Environmental Science and Engineering

Abstract: Anthropogenic activities have accelerated the discharge of nutrients into aquatic habitats, resulting in eutrophication and algal blooms around the world. Heavy metals from wastewater have been remedied using a variety of physicochemical procedures, although the majority of them are costly. Vetiver, a unique tropical plant, is recognized for its large biomass and dense root system and has been proven for various remediation studies. Phytoremediation, a cost-effective and eco-friendly technology. Each sq.m of Floating Wetland can process around 5 kg of N and 2 kg of P based fertilizers per year. Satellite photography was used to chart the Selvachinthamani lake. 24 geo-points were chosen based on their area and quantity, and water quality parameters were investigated. The lake's pH ranged from 7.12 to 8.99, EC was 0.8-1.85, DO was 3.4-5.8 mg L⁻¹, and BOD was 32-12 mg L⁻¹. As a result, Vetiver grass has a lot of promise when it comes to eliminating contaminants from wastewater.

Presenter Name: Gnana Keerthi Sahasa Raveendra

Title of Presentation: *Effect of Polyethylene Microplastics on Seedling Emergence of Vignamungol (Blackgram)*

Thematic Area: Environmental Science and Engineering

Abstract: The effect of micro-plastics on growth and development of crops is an area that remains largely unexplored. This experimental study was conducted to observe the influence of different concentrations (0.25, 0.50, 0.75 and 1.0%) of micro-plastics on black-gram using a standardized assay. The results indicate that there was a dose-dependent and time dependent effect of micro-plastics on seed germination, root and shoot growth. After 24 hour of incubation, there was a reduction in germination percentage from 83.33% in control to 66.67% in the treatment with 1% micro-plastics. Similarly, the rate of root growth declined in the initial 24 hours. Nonetheless, the rate of decline in germination and root growth reduced after 48 and 72 hours of incubation. This delay in germination and root growth is due to adherence of micro-plastic particles on the seed surface or micropyle. Hence, this study confirms that micro-plastics can exhibit transient effect on seedling emergence in black-gram.

Presenter Name: Kashish Bhambhani

Title of Presentation: *The Revolution of Agriculture with Digital Reforms*

Thematic Area: Environmental Science and Engineering

Abstract: India is a country currently employing 70% population. Last year it contributed to 20% of national GDP. As per Niti Ayog's report to maintain annual growth rate of 8-10%, agriculture must grow at 4% or higher rate. In view of sectors importance and realizing the harmful impacts of green revolution (excessive use of chemicals, overburdening of natural resources and the degrading of resources) has lead us to think about third green revolution which will now focus on sustainability with innovative methods and digital solutions. The third green revolution will also address global warming and climate change impact on agriculture and the nutritional requirement of growing population. To achieve these objectives new approaches like artificial intelligence, robotics, IoT, GIS, digital agriculture, Smartag, climate resilient agriculture with trends like remote sensing, aerial imaging, field mapping, data integration, localized weather data, accurate yield predictions, market analysis and drones are used.

Presenter Name: Jagadesh Muthumani

Title of Presentation: *Microbial Consortium to Mitigate Climate Change*

Thematic Area: Environmental Science and Engineering

Abstract: Nilgiri Hill Region (NHR), a UNESCO's world heritage site and a part of Western ghats biodiversity hotspot is amongst the most fragile ecosystems of the world which are facing the brunt of climate change issue. Hence to document and address this issue, a soil survey was conducted under major land uses of NHR to profile the complete soil microbiome. The effective bacterial species which possess the ability to offset atmospheric CO₂ was isolated and evaluated for their carbon dynamics under field conditions. The results revealed that the microbial mediated carbon accumulation was effective and exhibited a stronger microbial diversity and functional relationships. Thus, the consortium developed from the untouched ecosystem of western ghats has improved the carbon footprints, plant yield and serves as a promissory tool in achieving the sustainable development goals by providing, ecosystem services, crafting healthy food, tranquillizing climate change and land degradation neutrality in NHR.

Presenter Name: Mozammel Bin Motalab

Title of Presentation: *Towards Developing Standardized Precision Agriculture Boom Sprayer by Integrating Sensing and Actuation Components for Real-Time Site-Specific Applications*

Thematic Area: Environmental Science and Engineering

Abstract: The boom sprayer is a standard agricultural equipment used to spray crop protection products over crop fields to manage pests. Modern sprayers are equipped with systems for Variable Rate Application (VRA), by which spraying will happen in a controlled manner through planned mapping. This research aims at upgrading the sprayer to site-specific applications, through which it will become able to spray based on sensors. The sensors, which are cameras attached to computers that analyze images to detect anomalies, will be integrated into the sprayer based on a standardized machine communication system called Controller Area Network (CAN). The integration will take place by developing an electronic control unit that reads the detection of anomalies from the sensor and interprets it towards the CAN to control the nozzles instantaneously. The advantages are that site-specific applications can be performed while keeping the original functionality of the sprayer with minimal hardware changes.

Presenter Name: Poornima Ramesh

Title of Presentation: *Screening Protectants to Mitigate Ozone Stress on Rice Cultivars*

Thematic Area: Environmental Science and Engineering

Abstract: Tropical nations like India are concerned about the loss of agricultural productivity due to increased tropospheric ozone. To mitigate the damage caused due to ozone stress, application of protectants serves as one of the most effective methods. The aim of this study is to screen potential protectants (neem coated urea, ascorbic acid, calcium acetate, panchagavya, neem oil and ethylene diurea) that can alleviate ozone stress (100 ppb) on rice cultivar sensitive to elevated tropospheric ozone. Results indicate that, besides EDU, NCU and AsA were both significantly effective in reducing O₃ stress. Compared to control, application of 1% NCU improved the photosynthetic rate, stomatal conductance and chlorophyll content by 36.23, 25 and 22%, respectively. Similarly, application of 1% AsA significantly improved the aforementioned physiological trait by 35.91, 25.00 and 19.12% respectively. Thus, NCU and AsA can be a better alternative for protecting the plants from ozone injury.

Presenter Name: Reem Abukmeil

Title of Presentation: *Empirical Approach to Estimate Phosphorous in Potato Plants Using Foliar Spectroscopy*

Thematic Area: Environmental Science and Engineering

Abstract: Previous research highlighted the potentials of foliar spectroscopy in providing efficient information on nutrient contents based on leaf chemical content. The challenge of deploying such approaches in potato plants is that the petioles are the ground truth and not the leaves. This study aimed to investigate the correlation between the chemical testing of phosphorus (P) in potato petioles and leaf spectrum. Data points were collected from outdoor farms and indoor following different fertilization schemes. Chemical testing of petiole was done following the official methods of AOAC. The NIRS Analyzer was used to collect the spectra of the dried leaves within 400-2500 nm. Lasso multi linear regression model was followed to create the dataset between the P content and leaf spectrum. The reference concentrations of P ranged between 0.07% to 0.7%. The estimated concentrations showed a fair distribution around the fitting line with an r² value of 0.81 and an RPD value of 2.31.

Presenter Name: Taruna Namdev

Title of Presentation: *Climate Change - An Adverse Impact on Indian Agriculture*

Thematic Area: Environmental Science and Engineering

Abstract: The Global society is facing food insecurity and climate change like huge and complex challenges. The alarming population growth rate significantly affect the dimensions and complexity of these issues. India is the second most populous country in the world with this growing population industrialization and urbanization are also widened which is proportional to the emission of greenhouse gases as well as climate change. Adverse climate conditions raise the new level of complexity and challenges by affecting productivity and production and eventually the food security due to which the farmers of this area are continuously changing their crops for their survival.

Presenter Name: Milkessa Asfaw

Title of Presentation: *Impact of Climate Change on Cereal Crops Production in Ethiopia*

Thematic Area: Environmental Science and Engineering

Abstract: The objective of this study is to explore effects of climate change on cereal crops production in Ethiopia. The study employed the Autoregressive Distributed Lag (ARDL) approach to the Co-integration with an error correction term. The estimated model justifies the existence of a long-run relationship between cereal crops production, climate change variables and other explanatory variables. Precipitation has a positive and significant effect on cereal crops production both in the long and short runs, while temperature change has a negative, significant effect. In the long-run, cereal crops production was positively and significantly affected by arable land, fertilizer consumption, and carbon dioxide emissions. The coefficient of error correction term implies that 112% of the disequilibrium error is corrected toward equilibrium annually. So, the government should have to strengthen the implementation of the Climate Resilient Green Economy.

Presenter Name: Zheya Lin

Title of Presentation: *Carbon Stock Assessment in Biosolids Amended Soils Using Mid-Infrared Spectroscopy Technique*

Thematic Area: Environmental Science and Engineering

Abstract: Carbon (C) sequestration in soils has aroused attention to counteract climate change. Biosolids land application increases in the SOC pool. While biosolids as a soil conditioner or nutrient supply in agricultural systems is well-documented, but little is known about biosolids-borne C soil sequestration processes or the primary variables determining this capability. Conventional soil wet chemistry analytical methods are labor-intensive and time-consuming, many studies have emphasized the importance of rapid and low-cost methods for analyzing large numbers of samples. Infrared spectroscopy is one of the most promising technologies to increase the availability of soil data necessary for understanding carbon characteristics. This study aims to evaluate the potential of mid-infrared (MIR) spectroscopy combined with Partial Least Squares (PLS) modeling to predict carbon stock and its variables (total C, SOC content, soil pH, and bulk density) in biosolids-amended soils in Eastern Canada.

Presenter Name: Abishek R

Title of Presentation: *Inductive Cum Targeted Yield Model Based Integrated Fertilizer Prescriptions for Hybrid castor*

Thematic Area: Plant Science

Abstract: Fertilizer prescription equations (FPEs) were developed for hybrid castor by adopting Inductive cum Targeted yield model approach under irrigated condition on Alfisol. Initially soil fertility gradients were established with respect to soil available N, P and K nutrients and twenty four treatments were imposed in three fertility strips under factorial randomized design. From the field experimental data, the basic parameters [nutrient requirement (NR) and contribution of nutrients from soil (Cs), fertilizer (Cf), and farmyard manure (Co)] were computed. Fertilizer Prescription Equations for hybrid castor was formulated using the basic parameters.

Inorganic fertilizer alone

$$FN = 10.38T - 0.70 SN$$

$$FP2O5 = 4.62 T - 3.60 SP$$

$$FK2O = 6.30 T - 0.44 SK$$

Inorganic fertilizer with FYM

$$FN = 10.38 T - 0.70 SN - 0.69 ON$$

$$FP2O5 = 4.62 T - 3.60 SP - 0.89 OP$$

$$FK2O = 6.30 T - 0.44 SK - 0.60 OK.$$

Presenter Name: Aditi Chouksey

Title of Presentation: *Effects of Integrated Nutrient Management*

Thematic Area: Plant Science

Abstract: Title of the research problem:- “Effect of integrated nutrient management on soil properties, yield and quality parameters of Tomato (*Lycopersicon esculentum*)”

Objectives:

1. To study best INM practice for growth and yield of tomato.
2. To analyse the effect of INM on soil properties.
3. To find out the quality parameters of tomatoes.
4. To assess the economics of treatments.

TECHNICAL PROGRAM OF WORK:-

Location: Krishi Vigyan Kendra, COA, Gwalior.

EXPERIMENTAL DETAILS:

Name of crop: Tomato (*Lycopersicon esculentum*)

T1 – Control

T2 – 100 % RDF + FYM + PSB

T3 – 75 % RDF + FYM + PSB

T4 – 100 % RDF + FYM + Azotobacter

T5 – 75 % RDF + FYM + Azotobacter

T6 – 100 % RDF + FYM + NPK Consortium

T7 – 75 % RDF + FYM + NPK Consortium

Result - Maximum profit in terms of cost, effectiveness, firmness of fruit, quality was observed in 100% RDF + FYM + NPK CONSORTIUM.

Presenter Name: Deepanshi Deora

Title of Presentation: Effect of Sowing Dates and Row Spacing on Fenugreek CV Kasuri Under Malwa Region of Madhya Pradesh

Thematic Area: Plant Science

Abstract: The field experiment was conducted at Horticulture Research Farm, Department of Plantation, Spices, Medicinal and Aromatic Crops, COH, Mandsaur, R.V.S.K.V.V., Gwalior (M.P.) during the year 2021-2022 to evaluate the effect of sowing dates and spacing on (*Trigonella corniculata*) fenugreek cv. Kasuri with three dates of sowing viz. D1 - 15th October, D2 - 30th October and D3 - 15th November as main plot and four different row spacings S1 (15 cm), S2 (20 cm), S3 (25 cm) and S4 (30 cm) as sub-plot in factorial randomized block design with three replications. The results of the experiment showed significantly early germination, flowering, maximum morphology and yield parameters in main treatment D2. Sowing of kasuri methi with narrow spacing (S1) was recorded with significantly higher plant height, leaf yield and HI by leaf yield. However, wider spacing, (S4) obtained maximum yield attributing parameters except seed yield/ha, biological yield and HI by seed which was observed in S3.

Presenter Name: Chikezie Onuora Ene

Title of Presentation: Genetic Control and Generation Mean Analysis in Tomato Crosses for Yield Enhancement and Adaptability Under Cool Tropical Monsoon Climate

Thematic Area: Plant Science

Abstract: Despite achievements recorded in tomato breeding most choice cultivars find humid environments unfavorable. Crosses were made among 5 morphologically diverse parents; wild-parent, 'CLN2498D', 'CLN2417H', 'Tima' and 'UCDanINDIA' with the wild-parent a common pollen donor to study gene actions and generation means analysis in tomato. F1s, F2s, BC1s and BC2s generations were used. Additive and additive × additive gene effects were significant in wild-parent × 'CLN2417H', wild-parent × 'CLN2498D' and wild-parent × 'Tima' for fruit yield. This indicates the importance of additive variation for tomato yield improvement and encourages selection for yield improvement. In all generations with the exception of the parents, wild-parent × 'CLN2498D' and wild-parent × 'UCDanINDIA' expressed best performance for all traits including total fruit yield. This makes them good material for selection and exploitation in the tomato breeding for increased fruit yield and adaptability to humid environments.

Presenter Name: Gerba Daba Hirpa

Title of Presentation: Intensification of Coffee Agroforestry System Influences CLR Infections in SW-Ethiopia

Thematic Area: Plant Science

Abstract: In Ethiopia coffee cultivation systems strongly vary in their degree of management and shade cover. It is currently not known how coffee leaf rust (CLR) infection rates differ between the more natural forest coffee (FC) systems and the three other intensified systems i.e. plantation coffee (PC), semi-plantation coffee (SPC) and garden coffee (GC). For these reasons, CLR infection measurements such as incidence and severity across different coffee production systems in SW Ethiopia were carried out at two sampling times, once in November 2019 and once in January 2020. We randomly established five plots of 20 x 20 m totaling 200 plots across the four systems considered. Our findings demonstrated that the coffee production system influences CLR infection rates. As coffee management intensity increased, the CLR infections significantly increased. The lowest CLR infections recorded in the FC system seems to highlight the conservation value of natural forest coffee systems.

Presenter Name: Desta Fekadu Mijena

Title of Presentation: *Qualitative Traits Diversity in Achiote Accessions from Ethiopia*

Thematic Area: Plant Science

Abstract: Anchote is native to Ethiopia, grown for food and nutritional security. 400 accessions were collected from major producing areas and planted in 2017 and 2018 at Debre Zeit Agricultural Research Centre in an alpha-lattice design with 3 replications. Phenotypic qualitative traits were used to examine the degree and distribution of variation within and among accessions. Data were collected for 42 traits on 10 sample plants and analyzed with SAS software. Except for root crack and flesh defects, there was a highly significant difference in genotypes for root, leaf, vine, and flower traits. Creamy (63%), white (23.75%) and dark cream (10.75%) were the most common root flesh colors. Root skin color correlated positively with 20 root flesh colors. Genotypes were grouped into 6 major clusters and 17 principal components with 64.99% total variation. The observed variation may be attributed to genetic and environmental factors and the traits interaction may offer a new method to anchote breeding.

Presenter Name: Hari Meena

Title of Presentation: *A Cost-Effective Approach to Improve the Post-Harvest Leaf Quality in Indian Mulberry*

Thematic Area: Plant Science

Abstract: Mulberry (*Morus* species) leaves are the sole source of food for the silkworm (*Bombyx mori* L) and hence high-quality foliage is the key to the productivity of the silk industry. Rapid loss of water from the harvested leaves is one of the major reasons for quality loss which affects silkworm feeding behavior. Previous research in our laboratory indicated that epicuticular wax is important in maintaining leaf moisture in harvested leaves of mulberry. We designed and tested an agronomic approach to increase the cuticular resistance and enhance moisture retention capacity in the harvested leaves in two genotypes of mulberry, Dudhia White and Mattegere Local. Our approach increased leaf surface wax load and moisture retention capacity and helped in preserving leaf quality. The approach developed is cost-effective and can be easily adopted in farmer's fields.

Presenter Name: Jyoti Sengar

Title of Presentation: *Studies on Different Edible Oil Coatings on Shelf Life of Guava During Storage*

Thematic Area: Plant Science

Abstract: The present investigation entitled "Studies on effect of different edible oil coatings on shelf life of Guava (*Psidium guajava* L.) during storage" was conducted to find out the best edible oil coating to extend the shelf life of Guava. Each treatment was replicated 3 times and each replication had 3 guava fruits. 8 treatments viz. T0 (Control), T1 (coconut oil), T2 (Olive oil), T3 (Linseed oil), T4 (Sesame oil), T5 (Almond oil), T6 (mustard oil), T7 (castor oil) were used in Gwalior-27 variety. The results revealed that the T1 coating greatly extend the shelf life of guava while, maintaining sufficient TSS (12.6°Brix), Total Sugar (10.1%), Titratable acidity (0.203 %) and ascorbic acid (196 mg/100gm) than control. Guava fruits coated with T1 showed minimum Physiological Loss in Weight (7.44%), maximum Marketable Fruit Retained (86.63%). T1 followed by T2 showed better fruit color, flavor, texture and taste as compared to control and other treatments.

Presenter Name: Roksana Saleh

Title of Presentation: Type of Growing Media affects Plant Growth, Yield and Quality of Micro-greens

Thematic Area: Plant Science

Abstract: A study was conducted to evaluate the effects of different mixed growing media on yield and quality of two micro-greens species: namely, kale (*Brassica oleracea*) and arugula (*Eruca vesicaria*). The treatments were T1.1 (30%vermicast+30%sawdust+10%perlite+30% PittMoss (PM)); T2.1 (30%vermicast+20% sawdust+20% perlite+30% PM); For comparison, PM was replaced with mushroom compost (MC) in the respective media to form T1.2 and T2.2. Negative control (NC) was 60% sawdust+40% PittMoss and positive control (PC) was Pro-mix BX™ potting medium alone. Yield of kale and arugula was significantly increased by 205% and 264% in T2.2, respectively. Total chlorophyll and carotenoids were about 1.5-fold higher in T1.1 and T2.2 compared to PC. Kale sugar was increased by 23% in T1.1. Protein of kale and arugula was increased in T2.2 and T1.1, respectively. Total phenolics were increased by 1.5- fold in T1.1. Overall, T2.2 was the most favorable media to increase yield and biochemical compounds of plants.

Presenter Name: Shiferaw Tola

Title of Presentation: Hot Pepper Associated Bacteria and Antagonistic to Pepper Wilt

Thematic Area: Plant Science

Abstract: Pepper wilt fusarium and *M. incognita* disease complex emerged as major constraints on pepper production in Ethiopia. Unlike agrochemicals, rhizobacteria are putative as alternatives for management of soil-borne pathogens. To this end, phyto beneficial traits of hot pepper rhizobacteria and their antagonistic activities to pepper wilt pathogens were determined in vitro. From 48 rhizosphere samples, 147 bacteria isolates were obtained, 35 effective phosphate solubilizers, IAA(27.3-59.16µg/ml) and 20 chitin hydrolysis. Also, 22 isolates inhibited growth of *Fusarium* strains(26.7- 79%). Supernatants of 12 isolates inhibited hatching of *M. incognita* eggs (51-96%), J2 mortality (45-99%). Using the 16SrNA gene, 8 bacterial species were identified; *Bacillus* (3), *Paenibacillus* (1), *Pseudomonas* (3) and *Acinetobacter* (1). Currently identified bacterial strains have multiple beneficial traits and antagonistic activities that make promising microbial inoculants for further application under greenhouse and field conditions.

Presenter Name: Shivaranjani Koti

Title of Presentation: *Impact of Temperature on Variable Isolates of Rhizoctonia Bataticola Causing Dry Root Rot in Chickpea*

Thematic Area: Plant Science

Abstract: Due to change in climatic scenario dry root rot caused by *Rhizoctonia bataticola* (Taub.) has become one of the most important disease. Keeping in mind the importance of the DRR in chickpea, the present investigation aims to understand the following aspects

Cultural and morphological characterization of *R. bataticola* was conducted at five different temperatures. The results revealed that both radial growth and radial growth rate increased with increase in temperatures

Since, Temperature is one of the major abiotic stress influencing DRR expression. pathogenicity test of the isolates on susceptible chickpea cultivar BG-212 was conducted under different temperatures regimes with three replications each using paper-towel technique. It was found that disease severity also increased with increase in both temperatures and time points.

Three isolates were selected from highly pathogenic ones to further quantify the colonization and disease progression at two contrasting temperatures viz., 20 and 30°C by using BG-212 and specific primers Rb F3 and B3. *R. bataticola* colonization contradicted the results of DSI. Although It increased with increase in temperature and time points, more disease susceptibility was observed at 30°C than at 20°C

These studies revealed that abiotic factors play a key role in disease progression. Hence, it was advised to adjust sowing dates in such a way that peak flowering and podding stages should not be coincided with high temperatures.

Presenter Name: Zhimin Hou

Title of Presentation: *High-Throughput Single-Cell Transcriptomics Reveals the Female Germline Differentiation Trajectory in Arabidopsis Thaliana*

Thematic Area: Plant Science

Abstract: Female germline cells in flowering plants differentiate from somatic cells to produce specialized reproductive organs, called ovules. We investigated the molecular basis of the developmental program by performing single-cell RNA sequencing of 16,872 single cells of *Arabidopsis thaliana* ovule primordia at three developmental time points during female germline differentiation.

This allowed us to identify the characteristic expression patterns of the female germline and its surrounding nucellus. We then reconstructed the trajectory of female germline differentiation and observed dynamic waves of gene expression along the developmental trajectory. A focused analysis revealed transcriptional cascades and identified key transcriptional factors in the female germline differentiation trajectory. Our study provides a valuable reference dataset of the transcriptional process during female germline differentiation, shedding light on the mechanisms underlying germline cell fate determination.

Presenter Name: Tayab Soomro

Title of Presentation: *Understanding the Apple Volatilome*

Thematic Area: Plant Science

Abstract: Fruit flavor volatile is an important trait that determines consumer acceptability and by extension, its marketability. However, due to intense selection for production-related traits such as storability, less attention has been given to the flavor of apples, largely determined by volatiles. In order to better understand the genetic control of volatiles, we leveraged a large apple population from Canada's Apple Biodiversity Collection and performed untargeted gas chromatography to characterize the apple 'volatilome'. Esters and aldehydes were the most abundant classes of compounds. Butyl acetate and hexyl acetate were present in nearly every sample. We found that early-harvested apples tend to express larger numbers and higher amounts of volatiles than late-harvested apples. Taken together, these results will enable further research in the precision targeting of volatiles related to improving fruit taste and aroma.

Presenter Name: Liu Ruizhe

Title of Presentation: *Identification of a New Anti-fungal Peptide W1 from a Marine Bacillus*

Amyloliqefaciens Reveals its Potential in Controlling Fungal Plant Diseases

Thematic Area: Plant Science

Abstract: A bacterium, *Bacillus amyloliqefaciens* W0101, isolated from the Arctic Ocean showed potent anti-fungal activity against several plant pathogenic fungi. An anti-fungal peptide W1, with a molecular weight of approximately 2.4 kDa, was purified from the culture supernatant of the strain W0101 using ion-exchange chromatography and high-performance liquid chromatography. By analysis of LC-MS/MS, the peptide W1 was identified as a new anti-fungal peptide. Further analysis revealed that W1 could disrupt the hyphae and spore of *Sclerotinia sclerotiorum* and inhibit its growth. W1 suppressed *S. sclerotiorum* and *F.oxysporum* at a minimum inhibitory concentration of 140 and 58 µg/ml, respectively. The anti-fungal activity of W1 remained stable at 20-80°C or pH 6-11. These results therefore suggested that the peptide W1 from marine *B.amyloliqefaciens* W0101 may represent a new anti-fungal peptide with potential application in the biocontrol of plant diseases.

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Title of Presentation: *Seed and Leaf Micromorphology of Pleione in Taxonomy*

Thematic Area: Plant Science

Abstract: This study includes two articles, one is seed ultrastructure of *Pleione*, the other is leaf ultrastructure of *Pleione*. Classification of *Pleione* is always one of the difficulties in orchid classification, so we want to find a method which could solve this problem. This study selected the middle part of mature leaves and mature seeds, took photos by SEM, quantitative measurement with CAD software, then using R and SPSS to do difference analysis, correlation analysis and cluster analysis, finally to get micro-search tables. Our results showed whatever the cluster analysis about seed or leaf, they all could distinguish *Sect. Humiles*, *Sect. Pleione* and *P. bulbocodioides* complex. *P.xtaliensis* has many indicators, the same with *P. yunnanensis* and *P. forrestii*, their relationship need further research.



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