USM YEAR-END 42nd In-House Review

Proceedings

Theme:

Advancing Research and Innovations Towards Sustainable Development

December 1 - 2, 2022
University of Southern Mindanao
Kabacan, Cotabato

www.usm.edu.ph/rde
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OFFICE OF THE PRESIDENT

Message

My deepest appreciation to everyone participating in your Agency Research, Development and Extension In-House Review. As we are about to end the year, we need to evaluate our RDE projects in the university to achieve favorable outcomes.

We are grateful for the support given by our stakeholders and partner agencies as we engage in research innovations towards sustainable development. The road might be tough but as we join hands and share with each other our expertise, we can surely bridge the gaps.

Let's continue to seek knowledge, technologies, and innovations to meet the demands of this generation creating more opportunities for everyone. May God bless the USM RDE family.

FRANCISCO GIL N. GARCIA, PhD
SUC President IV

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VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

Message

It is my great pleasure to welcome all the participants to the 2022 Year-End RDE In-House Review.

This event is an opportunity for our faculty members and researchers to share their accomplishments, findings, and innovations in research, development and extension (RDE) projects. This scholarly event also provides us an opportunity to review our performance in RDE and identify our opportunities for improvement. We work together in USM to the achievement of the 'Sustainable Development Goals' through Advances in our Research and Innovations. We had strategically structured our RDE agenda and aligned our RDE projects into it to be relevant and competitive, and we aim to generate technologies to be transferred it to the community for sustainable development. Our investment, efforts and time spent in RDE plays a significant role in the economic growth and prosperity of our region and country. Let us continue to deepen our knowledge to develop breakthrough sustainable innovations.

In this scholarly occasion, I congratulate our researchers and extensionists for their contributions in advancing research and innovation in the University of Southern Mindanao. I also give thanks to the cohesive efforts of the working committee for organizing this 2022 Year-End In-House Review.

MA. TEODORA N. CABASAN, PhD
VP for Research, Development and Extension

RATIONALE

This Research Development & Extension (RDE) Agency In-House Review is an annual/yearly activity of the University. The main objective is to review and evaluate all on-going and completed Research Development and Extension Programs/Projects/ Studies. This serves as avenue for all researchers, extension workers and other stakeholders to convene and exchange new knowledge or products generated and development/extension strategies relevant to the University's vision, mission, and objectives. It is also through this activity that investments in RDE can be appraised thoroughly to ensure that RDE activities are geared toward addressing the needs and problems of the clientele of the university in its service area, in particular, and in the national level in general, for sustained agricultural development and its allied fields. Expectedly, very active interactions will form part of the highlights.

OBJECTIVES

To evaluate completed and on-going RDE projects/activities particularly with regard to the attainment of objectives and adherence to the approved programs;

To identify problems met during the implementation and recommend specific courses of action, i.e. continuation, extension, modification of planned activities and methodology, suspension, termination, etc., in compliance with the recommendations of the evaluating panel;

To identify technologies generated for field testing, verification, and piloting before its final dissemination/promotion and commercialization;

To identify mature technologies ready for packaging and dissemination;

To identify significant results for policy formulation and development;

To identify new researchable areas; and

7. To record and monitor both in-house and externally funded researches.

YEAR-END IN-HOUSE REVIEW PROGRAM 2022

GENERAL SCHEDULE OF ACTIVITIES

DAY 1: December 1, 2022 (Thursday)

TI ME	ACTIVITY
8:30 AM – 9:00 AM	Registration
9:00 AM – 10:00 AM	Opening Program
10:00 AM – 10:10 AM	Break
10:10 AM – 11:30 AM	Presentations
11:30 AM – 12:00 NN	Poster Viewing
12:00 NN – 1:00 PM	Lunch Break
1:00 PM – 2:40 PM	Presentations
2:40 – 3:00 PM	Break
3:00 – 4:20 PM	Presentations
4:20 – 5:00 PM	Tabulation of Scores

DAY 2: December 2, 2022 (Friday)

TIME	ACTIVITY
8:40 – 10:00 AM	Presentations
10:00 – 10:20 AM	Break
10:20 – 12:00 NN	Presentations
12:00 – 1:30 PM	Lunch Break
1:30 PM – 3:00 PM	Closing Program

Opening Program

Commercial Building
December 1, 2022
9:00 AM

Invocation	AVP
National Anthem	AVP
Welcome Remarks	Dr. Ma. Teodora N. Cabasan Vice President for RD&E
Message of the President	Dr. Francisco Gil N. Garcia SUC President IV
Rationale	Dr. Lydia C. Pascual Director, RDO Over-all Coordinator, In-House Review
Presentation of Evaluators	Dr. Mary Joy Cañolas Director, Extension Services Office

Emcee : Ashley Coleen Ortiz

EVALUATORS

Session I
Basic Research
Dr. Onofre S. Corpuz
Dr. Elizabeth D. Malacad
Dr. Naomi G. Tangonan

Session II
Applied Research
Dr. Emmanuel P. Leaño
Dr. Harris M. Sinolinding
Dr. Lorna P. Vilbar

Session III
Development and Social Research
Dr. Mervin G. Gascon
Dr. Ariel Roy L. Reyes
Dr. Lorna G. Valdez

Session IV - Extension
Mr. Ommal H. Abdulkadil
Dr. Marcelina O. Bahalla
Dr. Moveta P. Balala

MODERATORS

Session I - Basic Research
Day 1 (December 1, 2022)
AM - Renee Jane A. Ele
PM - Joeseph S. Quisado

Day 2 (December 2, 2022)
AM – Marlyn Resurreccion
Amancio S. Manceras II

Session II - Applied Research
Day 1 (December 1, 2022)
AM – Courtney Love Donque
PM – Kathleen Ivy Bolotaolo

Day 2 (December 2, 2022)
AM – Rene Cabahug
– Maria Angelika T. Balungay

Session III - Development and Social Research
Day 1 (December 1, 2022)
AM – Rowell Nitafan
PM – Phoebe Mae Baure

Day 2 (December 2, 2022)
AM – Gideon S. Sumayo
– Karizza Jane Pejaner

Session IV - Extension
Day 1 (December 1, 2022)
AM - Florie Jane Tamon
PM – Saque Amilbahar

Day 2 (December 2, 2022)
AM – Esperanza D. Lucena, Jr.
– JP E. Fortinez

SCHEDULE OF PRESENTATIONS

Note: 20 minutes per presenter (8 minutes presentation + 12 minutes Q&A)

Legend: Programs/projects highlighted in green are competing projects.

Day 1					
Start	**End**	**Basic Research (Science)**	**Applied Research (Science)**	**Development and Social Research**	**Extension**
10:10	10:30	101 - Mark Al-Jamie J. Muttulani - Germplasm Collection, Propagation And Fertilization Of Anthurium In USMARDC	201 - Adeflor G. Garcia - Project 3. Developing Rapid and Affordale Soil Nutrient Test Fretilizer Formulation for Rubber Cropping System	301 - Glyn G. Magbanua - Research Into Practice: Practical Applications of English for Specific Purposes (ESP) in the Workplace	401 - Pia Amabelle Flores - USM LIFER Project (Components 2 and 6): USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products
10:30	10:50	102 - Lorelyn Joy Turnos-Milagrosa - Organic-Based Interventions for Selected Crops and Sheep Nutrition	202 - Lydia Pascual - Potential Anti-Cancer leads from plants in Region XII Proj. Screening of Plants	302 - Riceli C. Mendoza - University of Southern Mindanao Graduate Tracer Study: Input for Institutional Quality Assurance	402 - Tamie C. Solpot - CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects
1:50	11:10	103 - Frederick John Navarro - Nutrient Retention During Commercial Production of HVC-USM Food Products	203 - Pia Amabelle Flores - USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products	303 - Jacinta T. Pueyo - Intersectionalizing K-12 Graduates' Competencies: a Baseline for Tertiary Instruction, and Materials Development	403 - Maricel G. Dayaday - SWIPE-Solid Waste and Integrating Program for E-Waste Disposal
11:10	11:30	104 - Joseph O. Castillo - Project 1. Effective Rubber-based Cropping System in Southern Philippines	204 - Edward a. Barlaan - Project Title: Banana Health Diagnostics: Molecular Surveillance of Major Disease Causal Pathogens of Banana in Region 11 and 12	304 - Arjay S. Agbunag - Design and Development of Online Pre-registration System for University of Southern Mindanao	404 - Ardniel A. Baladjay - Tablea: Pangkabuhayan para sa Kotabateñong Pamayanan A Community-based Tablea Production for Sustainable Livelihood in Cotabato

11:30	12:00	**Poster Viewing**			
12:00	1:00	**BREAK**			
1:00	1:20	105 - Purificacion O. Cahatian - Project 4. Development of Cost and Effective Pest and Disease Management of Rubber and Intercrops		305 - Ryan Z. Gonzaga - Development and Implementation of Online Application for Graduation and Final Clearance System	405 - Gelyn V. Amilbahar - Development of Video Materials on Organic Production of Indigenous Vegetables for Dissemination
1:20	1:40	106 - Adeflor Garcia - Land suitability analysis for rubber crops in Agusan del Sur	206 - Edward A. Barlaan - Validation of Molecular Markers for Identification of Cacao HYVs, Criollo Types and Disease Resistant Varieties through Marker-Assisted Breeding	306 - Pia Amabelle M. Flores - Project Title: Usm IP-TBM Phase II: Patent Mining of Rubber Technologies Thru Intellectual Property and Technology Business Management (IP-TBM) Operations of the University of Southern Mindanao	406 - Glyn G. Magbanua - Gender Research and Capability Building in Extension Projects: Exploring Engagement, Opportunities and Entry Points
1:40	2:00	107 - Mel Chrisel A. Sales - Verification of Soil pH, OM, N, P, and K Test Methods	207 - Jessie G. Elarde - Technology Development for Corn Silage Production and Its Utilization	307 - Pia Amabelle M. Flores - Project Title: DOST PCAARRD and USM Agri-aqua Technology Business Incubator (USM-ATBI)	407 - Analyn A. Gonzales - Community-based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification
2:00	2:20	108 - Anthony S. Agravante - Cultural Management of Stingless Bees for Sustainable Honey Production	208 - Edward A. Barlaan - NICER Project 1 - Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability	308 - April Rose T. Butalid - Integrating Gender and Development (GAD) Concepts Across Mandated Language, Literature, and Social Science Courses	408 - Meldred F. Samblaceno - Development of Community Based Tourism in Kabacan, Cotabato
2:20	2:40	109 - Tamie C. Solpot - Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber	209 - Gwen Iris D. Empleo - NICER Project 2 - Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement	309 - Eugene G. Ranjo - PPMP Automation for Productivity Improvement of e-Admin Services	409 - Leorence C. Tandog - Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS Plans) (Phase 2: Facilitating Independent Learning and Teaching in the New Normal)

2:40	3:00	**BREAK**			
3:00	3:20	110 - Jurhamid C. Imlan - Development and Acceptability of Mutton-Based Food Products for Emergencies	210 - Renel M. Alucilja - NICER Project 3 - Development of Optimized Post-Harvest Processing Approaches for Improved Quality of Cacao Beans	310 - Anita Sornito - Sustainable Green Library of USM, Kabacan	410 - Radji A. Macatabon - "Inpograp Ng Mga Inpormasyon Hinggil sa Omicron Variant Para Maiwasan ang Pagkalat ng COVID-19 at ang Benepisyo ng Pagbabakuna: Isang Teknikal na Pagsasalin"
3:20	3:40	111 - Rezin G. Cabantug - Development of a Commercial Grade Organic Planting Media Using Biochar as the Man Raw Materials	211 - Maria Elena N. Tanabe - Microbial diversity of Liguasan Marsh and their potential biotechnological applications in green energy, fisheries, sustainable agriculture and animal production, and human health	311 - Harem R. Roca - Upgrading of Cacao Post-Harvest Processing Center Facilities of USM	411 - Ellen Joy M. Farala - Strengthening Functional Literacy through Interactive Video Lessons (IVL) in Barangay Cuyapon, Kabacan, Cotabato
3:40	4:00	112 - Abubakar a. Murray - Perpetuation and Production of Red Ginger (*Zingiber Officinale* Rovb. Var. r*ubra*), Black Turmeric (*Curcuma caesia*) and Makabuhay (*Tinospora rumphii* Boerl) as Promising Raw Materials for Product Development	212 - Maria Elena M. Neyra-Tanabe - University of Southern Mindanao-Treelife Coco Sugar Research and Development	312 - Mark Al-Jamie J. Muttulani - Upgrading of Tissue Cultures Facility in University of Southern Mindanao	412 - JP E. Fortinez - CTI Capacity Building for Barangay Pisan: Pinning Intellectual Skills and New-Tech (PISan)
4:00	4:20			313 - Sandra Joy P. Pahm - Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao	
4:40	5:00	***Tabulation of Scores***			

Day 2					
Start	**End**	**Basic Research (Science)**	**Applied Research (Science)**	**Development and Social Research**	**Extension**
8:40	9:00	113 - Jasmin Pecho - Potential Use of Bca, Bio-stimulants and Water Management on Diseases of Dragon Fruit	213 - Leila Moscoso - Production, Commercialization & Technology Transfer of Kuliva Ice Cream	314 - Nenita E. Olero - Establishment and Conservation of Indigenous Tropical Fruit Crops in the University of Southern Mindanao	413 - Cheeze R. Janito - "Laro Mo, Sagot Ko": A Sports Management Skill Development Project
9:00	9:20	114 - Efren E. Magulama - Trait Enhancement of USM Varieties and Family Selections With Herbicide and Corn Borer Resistance	214 - Julius Jerome G. Ele - Development of Rice Topping Product – "kagikit" - From Chicken Meat	315 - Sheena Lucena - Establishment of Mango and Banana Germplasm for Conservation, Characterization, and Utilization	414 - Marlene Ofrecio - Kabataan Kontra Droga at Terorismo: Sports Development Project Phase 1: Skills Acquisition and Development
9:20	9:40	115 - Baser L. Mamalac - Project: Use of Triple Crop System in Enhancing Resource Use Efficiency and Crop Productivity in Corn	215 - Ivy Mar Cabornida - Processing and Packaging of Chevon Products	316 - Francisco Gil N. Garcia - University of Southern Mindanao Futures Thinking for Food Security, Systems, Innovatons and Sustainability	415 - Cherie Cano- Mangaoang BIO-NIHAN PARA SA KALIKASAN: Promoting Holistic Biodiversity Conservation Through Community Partnership
9:40	10:00	116 - Lothy F. Casim - Prevalence and Molecular Characterization of Gastrointestinal Parasites in Human-macaque Interface: the Case of Handling Leyte and New Israel, Makilala, North Cotabato	216 - Pia Amabelle Flores - Development of Diversified Products and Smart Packaging for Tinahito Brand of Smoked Catfish (*Clarias gariepinus*)	317 - Abubakar Murray - Organizational Interventions on Halal Certification Systems Towards Product Internationalization	416 - Leonila V. Papalid - Diffusion and Adoption of "Tilakas" Technology
10:00	10:20	**BREAK**			
10:20	10:40	117 - Florence Roy P. Salvaña - Assessment of Wildlife Encounters, Rescue and Trading in Protected Biodiversity Landscapes of North Cotabato	217 - Joseph O. Castillo - Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables	318 - Dyane Rhea Bana-ay - Development of e-LET Intervention Program for Professional Education	417 - Mary Rodelyn a. Cariaga - Project 6. Capability Building of Rubber Stakeholders and Role of Women and their Children Natural Rubber Industry in Agusan del Sur and North Cotabato

10:40	11:00	118 - Joan Sadoral - PROJECT 4. Disease Profile in Rubber-based Farming System in Southern Philippines	218 - Nenita Olero - National Cooperative test for Rice at USM	319 - Marianne I. Meriales - Needs Assessment, Gap Analysis and Intervention Mapping: Streamlining Nursing Program's Implementation Outcomes	418 - Mary Rodelyn A. Cariaga - Juan Food: Enabling Rural Families Through Home and Community Garden in Support for Household Livelihood in Barangay Dagupan
11:00	11:20	119 - Jeannie U. Duka - CornLai: USM Agri-based Initiatives in Food production to Address Food Security During Pandemic Crisis	219 - Marilyn S. Painagan-Calub - Optimization of Irrigation Flow Through Conduit Microhydropower to Generate Electricity for Off-grid Barangay of Kabacan, Cotabato	319 - Elsa a. Gonzaga - USM Education 4.0: Building Adaptive Higher Education Through Technology in the New Normal	419 - Hasim K. Iskak - Islamic Knowledge Development and Enhancement of Livelihood Skills Among Bangsamoro
11:20	11:40	120 - Edward A. Barlaan - "MECO-TECO" Joint Research Project: Improvement of Carabao Mango Production and Fruit Quality through Quantitative Trait Loci (QTL) Identification for Scab and Stem-End Rot Resistance by Genome Wide Association Studies (GWAS)		320 - Moreno B. Java, Jr. - Efficiency of Various Physical Exercises, Dietary Intakes, and Health Conditions of USM Employees: Basis for Program Intervention and Development of Database Management System	420 - Francisco Gil N. Garcia - Consultancy for Agricultural Productivity Enhancement (CAPE2) program
11:40	12:00	121 - Edward A. Barlaan - Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scrab- and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS)		321 - Rowell P. Nitafan - Exploring Indigenous Narratives From the South: the Pe'ngang and the Role of Datu in the Conflict Resolution Among the Obo Manobo	421 - Janice M. Bangoy - Integrated Services for Enhanced Education (I-SEE): A Connectivity Resilience Project Amidst Covid-19 Pandemic
12:00	1:00	**BREAK**			
1:00	3:00	**AWARDING AND CLOSING PROGRAM**			

Abstracts

10:10-10:30

101 - Germplasm Collection, Propagation and Fertilization of Anthurium in USMARC

Mark Al-Jamie J. Muttulani and Lorelyn Joy Turnos-Milagrosa

ABSTRACT. The Philippine Ornamental Horticulture Industry has come a long way when cut flowers are considered its major component and the growers are hobbyists or plant enthusiasts. One of the important cut flowers of the country is the Flamingo Flower, which is popularly known as "Anthurium". This crop is commonly grown in cooler climatic condition mostly in the uplands, but there are some potential varieties which can also be grown in the lowlands. To enhance the growth and yield performance of anthurium under lowland condition, a study on enhancing propagation of anthurium was conducted at the University of Southern Mindanao , which will be added to the existing collection of ornamental crops in USMARDC. The study was composed of two separate trials which were laid in Randomized Complete Block Design with three replications. Study 1 evaluated different organic fertilizers (rice hull compost, goat manure, cow manure, chicken manure, vermicompost) and Study 2 covered different plant growth regulators (ANAA, Growmore, Hormex). Treatments were applied twice a month through localized placement application for organic manures and soaking/foliar application for PGR. In Study 1, anthurium plants applied with cattle manure significantly produced tallest plants while goat manure and vermicompost-treated anthuriums resulted with greater number of developed leaves. Plants applied with rice hull compost were observed to have the widest spathe and chicken manure application resulted in highest number of flowers produced. For Study 2, plants applied with Hormex + Growmore significantly produced the tallest plants, longest leaf length and pedicel, and most numbered flowers. The application of ANAA+Growmore and Hormex+ Growmore significantly resulted in longest and widest spathe. Results of the study revealed that among the organic fertilizers and PGRs evaluated, chicken manure and Hormex+Growmore generally resulted in better growth performance, most especially in terms of the flower production.

Keywords: Anthurium, Organic Fertilizers, Plant Growth Regulators, Propagation Technique

10:30-10:50

102 - Organic-Based Interventions for Selected Crops and Sheep Nutrition

Lorelyn Joy N. Turnos-Milagrosa, Baser L. Mamalac, Mark Al-Jamie J. Muttulani, Josephine R. Migalbin, and Tamie C. Solpot

ABSTRACT. Organic foods, as products from organic agriculture, could surely contribute to better health of the consumers through reduced exposure to synthetic farm inputs and increased nutritional quality. The organic research program was composed of five components: Fermented Fruit Juice (FFJ), Fermented Plant Juice (FPJ), Fish Amino Acid (FAA) and Oriental Herbal Nutrient (OHN) were tested in tomato (Component 1), chili pepper (Component 2) and string beans (Component 3); monitoring pests and diseases (Component 4), and raising of sheep in organic pasture with the supplementation of Salvinia grass (Component 5). The crops' experimental sites were laid in RCBD with seven treatments and

three replications, and were located at USMARDC field. There was an area at the University Goat Project, USM, which served as the pasture area for the experimental sheep. For tomato and chili pepper trials, studies revealed that application of FFJ and FPJ generally resulted with statistically comparable means with the commercial checks in terms of the number of fruits per plant and the final yield. Statistically comparable results were also attained by FFJ and OHN with the commercial checks for the string beans. Significant findings with lower disease infection/insect infestation were generally observed in concoction-treated plants. Both FAA and FPJ-treated tomato plants had lower fruitworm damage caused by *Helicoverpa* spp. and lower *Epilachna* sp. population, than the untreated plants and plants treated with commercial checks. OHN, FFJ and FPJ-treated chili pepper and string beans had consistently lower *Cercospora* frogeye leafspot and *Cercospora* leafspot than the checks. Above results and findings revealed significant potentials of the concoctions tested in terms of both crop productivity and pest and disease reduction. The project on organic sheep raising revealed that with or without *Salvinia molesta* in the diet of the experimental animals, their performance in terms of body weight gain, soilage and dry matter intake was the same.

Keywords: Anthurium, Organic Fertilizers, Plant Growth Regulators, Propagation Technique,

10:50-11:10

103 - Nutrient Retention During Commercial Production of HVC-USM Foods

Frederick John Navarro, Deinmark Antes and Bryan Lloyd P. Bretaña

ABSTRACT. Ginger (*Zingiber officinale*) and turmeric (*Curcuma longa*) rhizomes are raw materials for powdered food products in USM High-Value Crops Processing Center (USM-HVCPC). Black turmeric (*Curcuma caesia*) and langkawas (*Alpinia galanga*) are propagated in Philippine Industrial Crops Research Institute (PICRI) as potential materials for new food products. Plant and food samples were analyzed to determine the change in macronutrient, total phenolic compound (TPC), and antioxidant property change (AOC) during the food production. Proximate composition was analyzed using standard procedures, while the TPC and AOP were analyzed using UV-vis spectrophotometry. This study developed a method using reverse-phase high-performance liquid chromatography (RP-HPLC) to simultaneously identify the significant compounds in plants and food products. Moisture, ash, crude fat, and crude fiber of food products showed a significant ($p<0.05$) decrease compared to the rhizome samples. Carbohydrates significantly increased, while crude protein did not change. The TPC and AOP decreased by 56% and 5%, respectively. The half maximal inhibitory concentration (IC50) increased between 19-29 ug/mL during production. Initial screening for configurational change in compounds showed a red shift after heating the rhizomes of black turmeric and langkawas, which was confirmed using RP-HPLC with gradient elution and a photodiode array detector (PDA). This implies that food processing reduces the raw material's macronutrient, phenolic content, and antioxidant activity. The study further concludes that RP-HPLC-PDA with gradient elution can be a potential technique for identifying and authenticating Zingiberaceae (Ginger family) rhizome products.

***Keywords*:** Anti-oxidant activity, proximate composition, RP-HPLC, total phenolic content, Zingiberaceae

11:10-11:30

104 - Project 1. Effective Rubber-based Cropping System in Southern Philippines

Joseph Castillo, Adeflor G. Garcia, Leandreux D. Ocasion, Linda Buquir, Honey B. Goloran, Edsphil Gunsi, Johnrey Gallego & Crismark Bayawa

ABSTRACT. The study was established in December 2019 at the University of Southern Mindanao Agricultural Research and Development Center, Kabacan, North Cotabato to design, showcase and determine the viability of rubber-based cropping system for smallholder farmers. The main crop is rubber planted on double hedgerows (2.75 m x 4.5 x 16 m). The main plots represent the perennial intercropping system: Rubber + cacao, rubber + coffee, rubber + banana-cardava; and rubber + lanzones. The annual intercrops represent the subplot: corn, mungbean, cassava and eggplant. There were three crop cycles of corn and mungbean planted in year 1 (2020) and year 2 (2021) for all the rubber perennial mainplots. Cassava and eggplant annual intercrops have one crop cycle during 2020 and 2021. The grain yield of USM Var 10, green corn yield of sweet and glutinous corn was all comparable among the different perennial intercropping models. The mungbean yield for three crop cycles were also comparable among the perennial intercrops. Meanwhile, tuber yield of cassava and eggplant yield did not differ significantly among the Rubber-based cropping system (RBCS) models. Furthermore, the yield levels of the annual intercrops were higher than the national average of corn, mungbean, cassava and eggplant. At 25 months after planting (MAP), average rubber stem girth across cropping system ranges from 15.0 – 18.0 cm. Rubber + Banana Model projected 6 tons/ha bunch yield. The performance of annual intercrops is now under field evaluation for the year three (3) of the RBCS models.

Keywords: Agroforestry, Rubber-Based Cropping System, Food Security, Farming Livelihoods, Household Income

1:00-1:20

105 - Project 4. Development of Cost and Effective Pest and Disease management of Rubber and Intercrops

Purificacion O. Cahatian, Joan P. Sadoral and Merian Mae D. Paule

ABSTRACT. Pest profiling was done for rubber and its perennial and annual intercrops at the University of Southern Mindanao, Kabacan, Cotabato. For rubber and perennial intercrops (banana, lanzones, cacao, and coffee), all sample trees were assessed twice a month. Annual intercrops (corn, mungbean, eggplant, and cassava), were assessed weekly for the presence of pests following a "Z pattern". Assessment for rubber, banana, cacao, and coffee revealed that sucking insects (order: Hemiptera) such as scale insects and mealybugs were the most prevalent insect pests infesting these perennials. On the other hand, an arachnid specie (mites) was observed devastating lanzones trees in the area. Low rainfall prevails some of the insect pests to increase their incidences. Major and minor insect pest species of each annual intercrops were also identified and recorded. Results showed that ESFB was the most dominant insect pests infesting eggplant, while black bean aphid was the most dominant infesting mungbean from vegetative up until the maturity stage, respectively. On the other hand, corn planthopper started

devastating corn from seedling up until the maturity stage. For our management, two botanical extracts were found to have promising results in terms of managing the population of ESFB, aphids, and as well as the yield of eggplant wherein number of fruits with borer, population count of borer, and weight of fruits with borer, had significantly lower results compared to the untreated control. Moreover, one botanical extract showed potential for controlling twig borer since it is comparable with the Synthetic Insecticide. Finally, for the management of Fall Armyworm, 10 grams of ash applied as powder had a promising result, but phytotoxicity effect was observed in treatments where ash was diluted in water.

Keywords**:** Botanical extracts, Crop diversification, Pest management, Pest Profile of Rubber-based Farming System, Wood Ash

1:20-1:40

106 – Land suitability analysis for rubber crops in Agusan del Sur

Adeflor G. Garcia, Johnvie B. Goloran, Leandreux D. Occasion & Spencer John P. Eborde

ABSTRACT. Rubber-based systems sequester soil organic carbon through the accumulation of leaf litter fall. Generally, higher elevations accumulate SOC due to lower microbial decomposition as a result of decreasing temperature with increasing altitude. The study was conducted to determine the amount of SOC sequestration and soil physicochemical properties in rubber-based system at various elevations in Cotabato (North). This was carried-out in areas with elevations ranging from 63 to 1171 masl. Samples were submitted and analyzed at Griffith University, Australia. Results were analysed through multiple linear regression analysis to determine the trend of soil organic carbon with elevation and some soil physicochemical properties. RCBD analysis was also use to differentiate the level of significance of some soil physicochemical properties. Higher SOC (4.35%), sequestered SOC (83.03 t/ha), SOM (7.49%) and total nitrogen (0.42%) were observed in high elevation (1171 masl) (Mimbalawag, Alamada). Meanwhile, lower SOC (1.11%), sequestered SOC (26.61 t/ha), SOM (1.90%) and total nitrogen (0.11%) were obtained in the lowest elevation9 USM Pasig, Kabacan). Based on the analysis, SOC, SOM and soil total N increases with increasing elevation. However, elevation did not influence soil pH, soil EC, total P, total K, bulk density, porosity and void ratio. The results imply that rubber plantations in higher elevations have higher SOC stocks compared with plantations in lower elevations.

Keywords**:** Elevation, Physicochemical, Regression, Rubber-based system, Sequestration, SOC

1:40-2:00

107 - Verification of Soil pH, OM, N, P, and K Test Methods

Mel Chrisel A. Sales, Randy B. Tumacder and Jhelyn Y. Abdulkadil

ABSTRACT. The Global Soil Laboratory Network (GLOSOLAN), under the Food and Agriculture Organization (FAO) put forward the harmonization of soil analytical data around the globe to provide reliable and comparable information between countries, generation of new harmonized soil data sets, and support evidence-based decision making for sustainable soil management. As a response, the Philippines organized the Philippine National Soil's

Laboratory Network (PhilNASOLAN) lead by BSWM and implemented the PD 1435 or the License to Operate Soil Laboratory (LTO – SL) authorizing all Soil's Laboratory to secure LTO-SL certificate and to harmonize the Soil's Laboratories in the Philippines. Thus, this project was initiated to improve the USMARDC-CL's quality system for testing soil for pH, SOC, N, P and K to ensure the reliability and validity of soil test results and conform with the existing standards and regulations. Specifically, to calibrate and repair the instruments used for soil pH, SOC, N, P, and K determination; and verify the methods used in testing soil for pH, SOC, N, P and K. Calibration of instruments were done both by the identified third-party calibrator, the DOST XI-RTSL, and the USMARDC-CL. Calibrated instruments were analytical balance, test weights (10, 20, 50, 100, 200 g), 50 ml graduated burette (2 pcs), 10 ml graduated pipette, 5 ml graduated pipette and pH meter. Instruments were calibrated having coverage factor (k) within the range of 1.96 to 2.02 and is within the assigned range of value with probability of 95%. Methods for soil pH (1:2 soil:water), OM (Walkley-Black Method), P (Bray II and Olsen's method) and K (NH4OAC) test were also verified which were tested on the required parameters that include precision, accuracy, limit of detection (LOD) and limit of quantification (LOQ). Soil OM and P Bray II method met all the required criteria of the test characteristics. The limit of detection (LOD) and limit of quantification (LOQ) for P (Bray II method) is 0.1557ppm and 0.5190ppm, respectively. Furthermore, the soil pH passed the precision (repeatability and intermediate precision), however failed the accuracy test. Soil P-Olsen's method met the criteria for intermediate precision but failed to meet the precision-repeatability and accuracy test. Initially, LOD and LOQ of soil P-Olsen's method, yields 0.0785ppm and 0.2616ppm, respectively while soil K-NH4OAC method were 0.0747ppm and 0.2490ppm, respectively. Both soil OM-Walkley Black and P Bray II methods for analysis can be performed in USMARDC-CL as the results indicate conformity of standard for method verification fit to its intended purpose. Further diagnosis, correction and conduct of method verification tests for soil pH, P-Olsen's method, K-NH4OAC extraction and N-Kjeldahl method should be done to ensure the USMARDC-CL's reliability in performing the said analysis.

Keywords**:** Harmonization, instrument calibration, method verification, soil analysis

2:00-2:20

108 - Cultural Management of Stingless Bees for Sustainable Honey Production

Francisco Gil N. Garcia, Neil Pep Dave N. Sumaya, Josephine R. Migalbin

ABSTRACT. Stingless bees also known as Meliponini are highly sociable insects that are native to tropical and subtropical environments. These bees locally known as "kiyot" and "pilot" are important in a number of ways. These include pollination, production of medicinal honey and other hive products as well as their value in aesthetics. The study was conducted to determine the diversity of stingless bees at the University of Southern Mindanao and the environmental factors affecting diversity and abundance. In addition, pests and disease were identified in bee colonies and an agricultural system was developed for honey production. Using honey-bait technique, only *Tetrogonula biroi* dominated the stingless bee population in USM. Ecological factors affecting stingless bees diversity are temperature and relative humidity with an average of 31.620C and 75.50%, respectively. *Aspergillus* spp. is the fungus observed to be associated with mummified stingless bees. A one hectare was developed for a diversified cropping system. The area has existing crops like calamansi, coffee and papaya. The vacant area in between the existing crops were planted with different vegetables crops such

as sweetpotato, eggplant, okra, pepper, bottle gourd, bitter gourd, alugbati, kangkong as intercrop. In addition, flowering plants like marigold, zinnia and sunflower were planted. The area was developed as bee pastures.

Keywords: stingless bees, *Tetrogonula biroi*, *Aspergillus* spp, agricultural systems, bee pastures

2:20-2:40

109 - Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber

Tamie C. Solpot, Ma. Teodora N. Cabasan, Bernadith T. Borja, Melesa M. Prado, Jomarie Abubakar

ABSTRACT. Leaf diseases of rubber are considered as one of the major constraints in rubber production resulting in lower latex yield. Biological control has been suggested as the most sustainable long-term solution toward disease management. In this project, the occurrence and prevalence of major and emerging leaf diseases of rubber in North Cotabato were determined and the evaluation of effective endophytic fungi against rubber diseases were done. There were seven leaf diseases of rubber observed in five municipalities of North Cotabato, with six (6) already known such as Colletotrichum leaf spot (*Colletotrichum gloesporiodes*), Corynespora leaf fall/spot, Phytophthora leaf fall/blight, powdery mildew, bird's eye-spot disease, and the algal spot disease. A new report of *Colletotrichum siamense* causing leaf spot disease was also described and confirmed. On the other hand, 321 endophytic fungi were isolated in pure culture and was evaluated in vitro using volatile compound assay, quadrant culture, and dual culture techniques for its efficacy against major leaf diseases of rubber. Among the endophytes, 3 (MK4L1-B, K5U2-S, MK3L4-1), 2 (MT4T3-1, MT4L5-31) and 1 (MK5L3-7) completely covered the entire medium and overgrew the pathogens *C. gloesporiodes*, *C. casiicola* and *P. palmivora*, respectively. Results of this study showed that endophytic fungi have a good antagonistic effect on mycelial growth of leaf pathogens of rubber and have the most potential to manage rubber leaf diseases.

Keywords: biocontrol, dual culture, endophyte, fungus, antagonist

3:00-3:20

110 – Development and Acceptability of Mutton-Based Food Products for Emergencies

Jurhamid C. Imlan, Josephine R. Migalbin, Jalaloden B. Marohom, Queennie L. Rufino and Maricel G. Dayaday

ABSTRACT. The project entitled "Development and Consumer Acceptability of Mutton Based Food Products for Emergencies" sought to promote the Halal mutton-based ready-to-eat (RTE) and ready-to-cook (RTC) food products that can be used in emergencies. Today, sheep are spread throughout the world. They live in a small herd and in different areas and environments. In the Philippines, sheep population stagnated from 30,000 in 1992 to the same population in 2002 (E. Davao, 2015). Dr. Patricio Faylon, Former Director of PCAARD explained that "Sheep as a commodity had very low priority as far as research and development concerned." The purpose of this project was on the development and consumer acceptability

of mutton based food products, notably in North Cotabato, to provide baseline data for sheep raisers to determine the market potential of packaged mutton products in the Philippines. Specifically, the demographic profile, level of consumer, level of awareness of Halal foods, attitude towards Halal foods, level of awareness on Mutton-Ready-To-Eat Halal Products, acceptance in terms of product appearance, flavor, aroma, and general acceptability were considered by 218 respondents. Most of the respondents were finished college, students, government employee, and were in their twenties. Generally, the mutton products were moderately acceptable to males. The least concern of the respondents for its acceptability was the price and their lack of awareness of some mutton-based food products. Moreover, the physico-chemical characterization is still on-going. For shelf-life determination, microbial analysis was conducted. Results shows that some foodborne pathogens manifested in samples were less than the standard set by the FDA. Proper storage of these samples such as freezing helps to minimize deterioration and immobilized foodborne pathogens promoting longer shelf-life. Thus, proper cooking and other processes may help to destroy the pathogens. Hence, it can be concluded that samples are fitted to the quality standard.

Keywords**:** Consumer Acceptability, Development, Halal Mutton, Food Products for Emergencies, Ready-To Eat (RTE) and Ready to Cook (RTC) Food Products

3:20-3:40

111 - Development of a Commercial Grade Organic Planting Media using Biochar as the Man Raw Materials

Rezin G. Cabantug and Tito Jun T. Tidula

ABSTRACT. Issues of food security and nutrition have wide-reaching implications for people and their environments, particularly in low and middle-income countries, especially during this Covid-19 pandemic. Having a backyard/urban garden for edible crops involves several cultural inputs. Among these, perhaps the most vital is the kind of growing medium used. Growing media must be amended to provide the appropriate physical and chemical properties necessary for plant growth. Thus, the development of a commercial-grade organic planting media using biochar as the main raw material was explored aiming to develop a biochar-based planting media for backyard gardening and validate its efficiency to support vegetable production. The project was able to produce the necessary substrate for the enhanced biochar and samples are now undergoing chemical analysis. Also, the eggplant trial showed potential in sustainable organic production showing comparable results with commercial organic products. Likewise, the project was able also to produce an organic liquid enhancer that could be used as a foliar fertilizer supplement.

Keywords: Organic agriculture, organic farming, organic soil amendments, biochar-based, concoctions

3:40-4:00

112 - Perpetuation and Production of Red Ginger (*Zingiber officinale* Rovb. Var. *rubra*), Black Turmeric (*Curcuma caesia*) and Makabuhay (*Tinospora rumphii* Boerl) as Promising Raw Materials for Product Development

Abubakar A. Murray, Prof. Frederick John B. Navarro, and Rezin G. Cabantug

ABSTRACT. The Philippines are bounded by many medicinal plants which are commonly used as herbal medicine by the natives. The expensive costs of pharmaceutical drugs today and the rising demand for supplements to boost human immune system due to the Covid-19 pandemic demands the potential of medicinal plants as alternative medicine. As such, the study aims to enhance the utilization of promising indigenous plants in the germplasm collection at PICRI, and reproduce such beneficial plants for possible product development. The project was able to establish the Black Turmeric (*Curcuma caesia*) and Makabuhay (*Tinospora rumphii* Boerl) garden, however the Red Ginger (*Zingiber Officinale Rovb*. var. *Rubra*) plants did not survive due to flooding. Samples were then collected and analyzed for some phytochemical properties. Likewise, the project was able also to produce 3 products for enhancement and reproduction. However, further analysis and testing must be done to ensure the acceptability of this product for commercialization under the USM Foods products.

Keywords: Black turmeric, Red Ginger, Makabuhay, alternative medicine, herbal products

10:10-10:30

201 - Project 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System

Adeflor G. Garcia, Johnvie B. Goloran, Leandreux D. Ocasion, Argie P. Casis, Oscar J. Jurado

ABSTRACT. The project, developing robust nutrient diagnostic tools and effective chemical formulation for rubber and companion crops to improve rubber productivity was materialized to evaluate the identified/developed protocols for effective analysis of soil availability of N, P and K, and soil nutrient status in the study areas for improving nutrient management and productivity in the rubber-based cropping systems and to determine the most suitable soil nutrient indices for N, P and K as basis for deficiency correction and fertilizer recommendation for rubber plants. Initial results of the study entitled "Physicochemical status of soil and plant and cuplump yield response of rubber as affected by fertilization in different ages of rubber.", showed an estimated 9.9% and 3.6% increase in the cuplump yield of rubber when it is applied with 1/2 rate of chemical fertilizer in 7- and 11-year-old rubber, respectively. Meanwhile, about 3.23% and 1.3% increase in cuplump yield when organic amendment is applied. Based on yield stability performance, 7-year-old rubber trees recorded 32.86 g-1t-1t-1 when applied with ½ rate of chemical fertilizer while 36.55 g-1t-1t-1 in 11-year-old rubber trees. This study provided empirical evidence on attaining the yield potential of rubber with fertilization that will impact on the productivity of rubber.

Keywords: cuplump yield, fertilization, organic amendment, rubber, soil nutrient

10:30-10:50

202 – Potential Anti-Cancer leads from plants in Region XII Proj. Screening of Plants

Lydia C. Pascual, Kate Paula M. Ysulat, Lara Jade J. Estimo, Loveille Jun A. Gonzaga, Harem R. Roca, and Francisco Gil N. Garcia

ABSTRACT. Cancer is the second cause of death worldwide whose treatment remains very expensive and inaccessible to many. Research showed the use of plants as potent anticancer agents that are effective and safe in the management of cancer. This study aimed to determine anticancer plants found in Region XII that can kill cancer cells but are safe to normal cells. Antiproliferative and antimigratory activities of the plant extracts were determined using MTT and scratch wound assays respectively, while toxicity assay: Hepatotoxicity and Nephrotoxicity were determined using Cytotox 96® NonRadioactive Cytotoxicity Assay. Confirmatory Orthogonal assay were determined using CyQUANT™ Direct Red Cell Proliferation Assay using colon cancer cell lines (HCT 116). The results of the study revealed that out of 41 plants samples, 25 plants showed antiproliferative and 30 with anti-migratory activities on liver cancer cell lines (HepG2) at the same time safe to liver and kidney cells except for one sample to be taken with precaution. Confirmatory Orthogonal assay confirmed the anticancer activity of 23 plant samples on human colorectal cancer cell lines (HCT116). The overall results revealed the top priority plant samples for further analysis: 3 Top- tier samples, 8 samples for second-tier hits and 15 samples for third-tier hits. These priority plants samples will be subjected for separation, isolation, and purification to determine the anticancer compounds responsible for its bioactivity.

Keywords: Anticancer, Medicinal plants, MTT assay, Scratch wound assay, Toxicity Assay

10:50-11:10

203 - USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products

Pia Amabelle Flores, Jonald Pimentel, Rowell Nitafan, Vic Lawrence Oliva, Leanne Jay Manceras, Bryan Bretana, Mary Joy Cañolas, Zaibel Rose Tamon, John Rey Agustin, Janice Labatorio, Carlo Reston

ABSTRACT. The USM LIFER Project is an initiative of the Philippines Futures Thinking Society under the Office of Senator Pia Cayetano based at the University of Southern Mindanao. It aims to investigate potential protein sources in Ligawasan Marsh towards a futuristic approach in empowering its communities. The project is composed of seven components to represent holistic approach from fish stock assessment to policy development, product development, product quality assurance, and even capacity- building in Ligawasan marsh community itself. With these, the following outputs were accomplished: (1) evaluated fish stock of nine important fishery resources in one Ligawasan Marsh fish landing site; (2) conducted surveys to profile social demographics of Ligawasan community; (3) evaluated shelf- life of catfish Ready- To-Eat products at one- month storage condition; (4) inspected quality assurance in fish RTE products; and, (5) conducted capacity- building activities on fish processing food safety for Ligawasan Marsh community. Another study was incorporated in the project on RTE meat- based products as protein source such as luncheon meat, sausage, bacon, and corned pork meat products wherein sensory evaluation was investigated. The project presents a strategic ground to provide long-term economic and social impacts in Ligawasan Marsh through effective resource management, and offering livelihood opportunities from developed fish- based RTE product from available resources. The project herein believes that this is the start of creating the bright future for Ligawasan Marsh.

***Keywords*:** Ligawasan Marsh, Future's Thinking, Protein, Ready-to-Eat (RTE), Food Security

11:10-11:30

204 - Banana Health Diagnostics: Molecular Surveillance of Major Disease Causal Pathogens of Banana in Region 11 and 12

Edward A. Barlaan and Jeralden O. Vido

ABSTRACT. Banana production in the Philippines is constrained by different diseases adversely affecting export industry and domestic consumption. Major diseases in banana include Panama disease caused by *Fusarium oxysporum* f. sp. *cubense*, bunchy top by Banana bunchy top virus and Moko by *Ralstonia solanacearum*. The study generally aimed to assess the health status of different banana growing areas in Regions 11 and 12 through advanced molecular approaches. Specifically, it aimed to determine the disease-related problems in banana growing areas; employ molecular detection and monitoring of causal pathogens banana diseases utilizing the highly specific probes (probe kits) for target pathogens using digital PCR (dPCR) and quantitative real-time PCR (qPCR) technologies; and provide feedback information to the banana growers on the health status of banana production areas.

Representative samples from plants and soils were obtained through collaborations with banana individual farmers, cooperatives or associations, tissue culture laboratories, national corporations and multi-national companies comprising a collective production area of 26,484 hectares. Of the three major diseases, Panama was the most prevalent in both regions. The causal pathogens were detected and monitored in diseased and healthy-looking plants or soils using the probe kits assayed in dPCR or qPCR platforms. The dPCR was more efficient in detection than qPCR particularly at very low microbial loads. These new technologies also helped in pathogen detection and monitoring in various control or preventive measures for Panama disease employed by government and private entities. Hence, this study affirmed the utility of the probe kits and advanced molecular technologies to support and help the banana industry.

Keywords: banana, banana bunchy top, Digital PCR, Moko, quantitative real-time PCR, Panama disease

1:20-1:40

206 - Validation of Molecular Markers for Identification of Cacao HYVs, Criollo Types and Disease Resistant Varieties through Marker-Assisted Breeding

Edward A. Barlaan, Allen Jay E. Austria, Janelle B. Opinaldo

ABSTRACT. There is a need to validate the molecular markers were generated from the completed DOST-PCAARRD funded project for utility in varietal identification and potential use in marker assisted breeding. The study aimed to validate SSR markers to identify NSIC recommended cacao varieties in commercial nurseries; to assess the claimed Criollo cacao types in the Philippines for identification of true Criollos, and to validate the SSR markers for identification of cacao breeding materials with resistance to vascular streak and Phytophthora diseases. The Bureau of Plant Industry and accredited cacao nurseries in Regions XI and XII were communicated for collaboration of the project. Leaf samples were used for DNA extraction, PCR amplification and fingerprint analysis using the primers of functional SSR markers. A total of 555 leaf samples from randomly selected cacao seedlings were collected from 39 nurseries across Regions XI and XII. Of 175 UF18 and 125 BR25 validated, about 17% were non-UF18 and 28% non-BR25, respectively. One hundred ninety-eight claimed Criollo types along with Forastero, and Trinitario collected from different regions in the Philippines were analyzed using the SSR markers. The cluster analysis based on 22 primers exhibited three major clusters indicating Criollo, Trinitario and Forastero groups. Cluster analysis showed putative true Criollo types, which needed further evaluation at phenotypic and genomic levels. Twenty-one cacao accessions from the USM genebank were collected and molecularly screened for disease resistance. SSR markers C10238t1 and C1618t2 were used for screening *Phytophthora palmivora*; and C4101t2, CDRAat11 P3T7 C74 and C1223t3 for *Lasiodiplodia theobromae*.

***Keywords*:** Cacao, SSR Markers, NSIC Varieties, Disease Resistance

1:40-2:00

207 - Technology Development for Corn Silage Production and its Utilization

Jessie G. Elarde, Nenita E. Olero, Geoffray R. Atok, Jurhamid C. Imlan & Mary Ann B. Rama

ABSTRACT. The unstable supply of forage materials is one of the major drawbacks in livestock industry which this experiment tries to address through the development of forage corn with high silage yield, understanding the effect of feeding corn silage without corn ear to small and large ruminants in terms of milk yield, weight gain, and carcass quality and determining what is the most profitable interaction of fertilizer, plant density, and variety in terms of silage yield. In developing forage corn, there were 204 tall families selected from USM Var 5 and these will be advanced for more cycles of the modified ear-to-row breeding system until reaching a height of more than 3 meters. Three thousand ninety-four kilograms (3,094 kgs) of corn silage with ear and one thousand nine hundred kilograms (1,900 kgs) of corn silage without corn ear were produced for feeding to experimental animals. Laboratory test results show that silage without ear had almost similar to those silage with corn ear and Total Mix Ration (TMR) of USM-Philippine Carabao Center in terms of percentage Ash (9.29%), Crude Fiber (10.03%), Fat (10.24%), Acid Detergent Fiber (58.49%) and Neutral Detergent Fiber (71.86%). The most profitable interaction of fertilizer, planting density, and variety was observed from USM corn Hybrid NCH 33 planted at a density of 133,333 plants/ha and fertilized at the rate of 120-60-60 kg/ha NPK with a net income of Php55,008/ha. The erect leaf architecture of NCH 33 which reduces mutual shading might be the reason why this hybrid is suitable for high-density planting.

***Keywords*:** carcass quality, corn silage, forage, milk yield, modified-ear-to-row

2:00-2:20

208 - NICER Project 1 – Molecular Fingerprinting of Cacao parental Recommended HYVs and true Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Profitability

Edward A. Barlaan, Bernadith T. Borja, Alvin John R. Quitel, Elcy Jane C. Naquitquitan, Kristine D. Paguntalan

ABSTRACT. The validated SSR markers for cacao are essential tools for identification of genuine varieties to guarantee planting of true-to-types to ensure increased productivity and profitability. The study aimed to identify and molecularly fingerprint parental sources of recommended cacao HYVs and true Criollo for multiplication of quality planting materials and to propagate and distribute the certified true-to-type cacao varieties as mother plant sources or genetic stocks. Functional SSR markers were used to validate NSIC recommended varieties and differentiate true Criollo types from non-Criollo accessions. Forty-one accredited nurseries across Regions XI and XII agreed in collaborating with the project. Leaf samples of cacao mother plants from different accredited nurseries were collected and stored. Claimed Criollo-types leaf samples were collected from different regions of the Philippines. DNAs of collected leaf samples were extracted, quantified and used for PCR amplification and gel electrophoresis. Assessment of claimed-criollo types using SSR markers is underway. For NSIC cacao varieties, most varieties sold in the nurseries are BR25 and UF18. From molecular verification,

57 genuine BR25 mother plants from various nursery sources were identified using the marker C8223t1 while 99 genuine UF18 were identified using C7729t1. Molecularly verified and BPI-certified cacao seedlings of UF18 and BR25 were propagated and distributed to different cacao nursery operators and farmers in Regions XI and XII. So far, a total 3,830 cacao quality planting materials were already distributed to 74 cacao nursery operators and private individuals. About 3,500 PBC123 seedlings were planted to serve as root stocks for further clonal propagation and distribution.

Keywords: Cacao, Criollo, NSIC varieties, quality planting materials, SSR markers

2:20-2:40

209 - NICER Project 2 – Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement

Gwen Iris D. Empleo, Ms. Ivy Pasquin, Ms. Avigel I. Cabrillos, Ms. Jeannie R. Binaohan, Erwelle Evan Escalante

ABSTRACT. The identification of *Theobroma cacao* L. clones that possess desirable traits for varietal improvement is essential to meet changing production and market conditions. This project addresses the problems on the relatively low yield and low bean quality in cacao, and the prevailing diseases and pests affecting cacao productivity. The main goal of this project is to carry out effective cacao breeding strategies for the development of cacao varieties with improved yield, bean quality, and resistance to diseases and pests. The project aims to rehabilitate the existing USM cacao gene bank; enhance the USM cacao gene bank through the introduction of additional cacao clones; evaluate the morphological and agronomic characteristics of the cacao clones for the development of the Philippine cacao catalogue; develop cacao hybrids with high yield, bean quality, or resistance to pests and diseases, and validate the F1 identity of the products of crosses using molecular approaches. To date, scions from 66 cacao clones were collected from the Davao Bukidnon and Camiguin Island and grafted at the USM nursery. A total of 69 fruit-bearing cacao clones were partially evaluated at the morphological level using the available descriptors. Seedlings from F1 and 3 three-way crosses developed from selected parents through hand pollination are grown in the nursery.

Keywords: Breeding, Cacao, gene bank, hybridization, introduction

3:00-3:20

210 - Nicer Project 3 – Development of Optimized Post-Harvest Processing Approaches for Improved Quality of Cacao Beans

Renel M. Alucilja, Maricel G. Dayaday, Sheena B. Lucena, Lydia C. Pascual, Ritchell Joy T. Cuarteros, Jayson S. Baltazar, Keith Bryan V. Marcelino, Denver Von O. Ariaga, Sanshine O. Lacsao and Nelly Grace F. Toñacao

ABSTRACT. Cacao bean quality significantly influences the market price of cacao-based products. Limitations such as inadequate knowledge and expertise in post-harvest processing technologies, unavailability of post-harvest processing facilities, and lack of access to market information and high-value markets must be addressed. This study aimed to develop optimized post-harvest processing approaches for improved quality of cacao beans. The design for the

development and optimization of post-harvest machines was crafted. Fabrication and modifications of the machines and prior runs were done in preparation for the operational testing. Benchmarking surveys for the drying, fermentation, pod storage, and bean storage were done in 17 different sites of Region XI, XII, and XIII to determine the common practices for innovation and optimization. Preliminary studies on fermentation and drying were conducted and samples were submitted for analysis. The physico-chemical analysis determined the different nutrient content and chemical compositions of processed cacao beans. A total of 53 samples were collected and among the bean samples, fermentation of 5 to 9 days was slightly acidic in terms of pH and has a higher percentage value of titratable acidity (acetic acid content). Direct sun drying of 7 to 9 days and mechanized drying of cacao beans indicated a lower percentage of moisture and fat content. Meanwhile, the ash content of all the collected cacao beans lies on the typical value and has a higher percentage of carbohydrates. Region XII recorded higher protein content compared to samples collected in Region XI.

Keywords: Benchmarking, Cacao, Optimization, Physico-chemical, Post-harvest

3:20-3:40

211 – Microbial Diversity of Liguasan Marsh and their potential biotechnological applications in green energy, fisheries, sustainable agriculture and animal production, and human health

Maria Elena N. Tanabe, Cromwel M. Jumao-as, Chea Mae O. Libo-on, Jade Amythist C. Sevillano

ABSTRACT. Liguasan Marsh is the largest wetland in the Philippines. Its high biological productivity supports the livelihood of the communities around the area. The unique ecological environments of the marsh made them a hotspot for studies such as discovering novel bioactive compounds from microorganisms. This study aimed to isolate novel metabolites from microorganisms that have potential for agricultural, industrial, and pharmaceutical applications in Liguasan Marsh. Soil and water samples were collected from Cuyapon, Kabacan, Cotabato. The soil's culturable microorganisms were isolated and tested for Indole Acetic Acid (IAA), Hydrogen Cyanide (HCN) and Ammonia production, and Phosphate Solubilization Efficiency (PSE). A total of 15 microalgal genera were presumptively identified from the two-month-old heterogenous algal culture. Microscopic examination revealed Chlorella sp. as the most abundant species in the culture, while Scenedesmus as the most dominant genus. Protein and lipid content of microalgae were determined by proximate analysis. Results show that the protein content was about 18.4%, while lipid constituted 0.234% of the entire biomass. A total of 55 bacterial and 18 fungal colonies were isolated from soil sample collected from Liguasan Marsh. Among the 55 bacterial isolates, five isolates were positive for indole acetic acid, twenty-seven for ammonia production, and four for hydrogen cyanide production. In addition, 36 out of the 55 isolates were tested for phosphate solubilization. Seventeen isolates exhibited positive for phosphate solubilization which ranges from 1.01 to 1.78 PSE. The plant growth promoting attributes of the isolated fungi were scheduled for testing on the fourth week of November, 2022.

***Keywords*:** Ammonia, Indole Acetic Acid, Liguasan Marsh

3:40-4:00

212– University of Southern Mindanao-Treelife Coco Sugar Research and Development

Maria Elena N. Tanabe, Ivy Jane P. Nabre, Chea Mae O. Libo-on, Cromwel M. Jumao-as

ABSTRACT. Phosphorus is one of the macro-elements required by plants to grow. However, plants could not utilize the available insoluble phosphorus in the soil. Hence, microorganisms that can hydrolyze organic and inorganic phosphorus to soluble phosphorus are essential. This study aimed to develop phosphate solubilizing bacterial inoculants isolated from locally produced soil amendments. Bacteria from the locally produced soil amendment were isolated and screened for phosphate solubilizing activity using Pikovskaya agar. The four isolates that showed the highest phosphate solubilization efficiency were considered and subjected to compatibility testing in dual, triple, and quadruple formulations. Among the nine isolates tested for phosphate solubilization, *Bacillus altitudinis* USM-ISOK4, *Bacillus subtilis* USM-ISO19, *Bacillus megaterium* USM-ISOP9, and *Bacillus aryabhattai* USM-ISOP10 were chosen based on their individual phosphate solubilization efficiency (PSE) 11.19, 11.9, 11.63, 10.8, respectively. The formulations from the four isolates showed compatibility. Among the dual, triple and quadruple formulations, dual-culture formulations of *B. subtilis* - *B. megaterium* (11.23), and *B. subtilis* - *B. altitudinis* (12.27) have the highest PSE. Dual formulation *B. subtilis* - *B. altitudinis* (12.27) showed significant difference between *B. aryabhattai* (10.8), formulations of *B. aryabhattai*–*B. subtilis* (10.87), *B. megaterium* – *B. altitudinis* – *B. subtilis* (11.83), and *B. megaterium*–*B. aryabhattai*–*B. altitudinis*–*B. subtilis* (10.83). The study recommends the optimization of the PSE of all the isolates, in vivo testing of the single and formulated isolates, and carrier testing for packaging and shelf-life.

***Keywords*:** Bioformulation, Bioinoculant, Dual culture, Phosphate solubilizer, Soil amendment

10:10-10:30

301– Research Into Practice: Practical Applications of English for Specific Purposes (ESP) in the Workplace

Glyn B. Gabano-Magbanua, Lawrence Anthony U. Dollente and Anamarie B. Uyangurin

ABSTRACT. English for Specific Purposes (ESP) is a language teaching approach focusing on the development of language skills needed by learners for success on the job. ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. Today, it has become one of the most prominent areas of foreign language teaching and its practice is centered on the language appropriate to specific activities in terms of grammar, lexis, register, study skills, discourse and genre. For this specific project, the researchers identified and categorized errors in the written materials of public safety and academic professionals and utilized the result to develop materials to enhance the discursive competence of professionals through ESP. Police reports as well as abstracts and narrative reports comprised the corpus of the study. Error analysis was conducted in six stages: data collection, data reduction, data coding, error identification, error classification and reporting. Errors were categorized into lexis, syntax, mechanics. At the lexis level, the most frequently occurring errors include articles, preposition, conjunction, relative pronoun, verb tense and consistency. At the syntax level, identified errors include misplaced modifiers, fragments, ambiguous construction, parallelism and run-on. Errors in mechanics were likewise observed especially in the reports written by public safety officers. Numerous moves in organization were also observed in the materials collected. For the abstract, moves identified include: I-O-M-R, O-M-R, I-O-R, O-R-M and I-M-R. A self-help instructional material was designed to respond to the needs identified in the study.

Keywords: error analysis, ESP, lexis, syntax

10:30-10:50

302 – University of Southern Mindanao Graduate Tracer Study: Input for Institutional Quality Assurance

Riceli C. Mendoza, Nora B. Bolences, Julius Jerome G. Ele, Jonald L. Pimentel, Jeannie U. Duka, Ma. Lezel P. Pataray, Ivy Mar Cabornida, Melecio C. Cordero, Jr., Elizabeth Molina, Manuel J. Tayong, Emmalyn Mamaluba, Abdulnasser G. Makalugi, Norge D. Martinez, Ronielyn F. Pinsoy & Leorence C. Tandog

ABSTRACT. The third phase of graduate tracer study is spurred with the desire to initiate and entrench GTS as means by which quality assurance in the university is achieved. Since the dynamics of employment is dependent on the kind of competencies needed, universities have to be forward looking to address and engineer desirable changes. In light with the current issue, this study is conducted to determine the employability of USM graduates and enhancement of program offered by the university in order to meet the changing educational, socio-economic, industrial and technological demands on the new century. This study used descriptive survey method involving graduates from 2018-2021. As of data gathering, 20.54% total graduates are able to answer the questionnaire crafted by the Commission on Higher Education (CHED) and slightly modified for the purpose of the study. Said research instrument is sent in google forms where data from all responses are available immediately after each form submission in the

responses tab. Results revealed that 2, 051 were able to answer the survey questionnaire for undergraduates in which 63.82% of them were female while 36.18% were male; 87.91% were gainfully employed wherein 51.73% of them have jobs related to their course completed and 11.41% were unemployed. One-hundred fifty post-graduates were able to answer the questionnaire; 73.33% were female and 26.67% were male. Most of the respondents were Teachers, Instructors and Professors. For the undergraduates, 77.96% were very much satisfied with their degree's Flexibility/Adaptability, 66.85% strongly agreed with the respect being shown to them in their learning environment and 87.03% identified library as the most adequate facility in the university. Moreover, computer skills were considered to be what their curriculum has prepared them for the job. Communication skills were very much useful to the present job of the respondents. Asking questions for clarification from the appropriate source (71.92%) were the respondents' perception on competencies, trying to find the best method to do a given job (34.91%) were their perception on skills and believing that every person in the world should be treated equally (71.48%) was on values. Content of curriculum offered was considered to be the university's most observed strength. However, the study identified exchange programs as one of the areas that should be improved. In terms of communication skills, most of the respondents can express themselves easily and as graduates, they considered themselves as compliant, determined and flexible. It is true to the respondents that respecting opponent/s is part of their teamwork and problem-solving skills (41.88%) while believing that teamwork is best when everyone is involved in taking decisions as part of their leadership skills (67.48%). For the post graduates, 100% were employed; 43.33% were very much satisfied with their job and 84.00% of the respondents have jobs related to their post graduate degree, 80.65% rated that academic knowledge has the highest contribution of their degree at USM. Expanding knowledge of fields related to the current areas of professional specialization ranked first as the graduates' reason for pursuing post graduate at USM. After earning their post graduate, 74.67% continue working as employee or stay in their current job. In terms of the learning environment, 72.67% strongly agreed of showing respect to a person and 86.00% identified classrooms as the university's most adequate facility. For perception of competencies, values and skills, 70.67% described themselves as admitting to mistakes, 70.67% believed that every person in the world should be treated equally, and 38.67% considered solving a problem focusing on its main point, respectively. The results further show that respondents can express themselves easily and 63.33% considered themselves as calm, happy, compatible and cooperative. It is true to the respondents that respecting opponent/s is part of their teamwork and problem-solving skills (51.33%) while believing that teamwork is best when everyone is involved in taking decisions as part of their leadership skills (69.33%).

Keywords: Harmonization, instrument calibration, method verification, soil analysis

10:50-11:10

303 – University of Southern Mindanao Graduate Tracer Study: Input for Institutional Quality Assurance

Jacinta T. Pueyo, Karizza Jane B. Pejaner, Jemima M. Atok, and Kevin Ray V. Abesamis

ABSTRACT. Philippines in the latest Programme for the International Student Assessment (PISA) Examination showed the need for reforms and recalibration of the K to 12 Program to further achieve its purpose. However, this research discovered that one of the salient features of the K-12 program, which are its globally competitive competencies, particularly in the critical areas of Mathematics, Science, and English, are deficient in the first-year students

attending four (4) different universities in Cotabato in Academic Year 2021-2022. This quantitative research employed standardized examinations to assess the students in different competencies supposedly achieved in the K-12 program. The 519 target respondents were profiled where they achieved mean scores for each subject ranging from 9 to 10 which are far lower than the expected scores they should have for each subject after graduating from Senior High School. The intersectionality framework was used to identify the hidden barriers that led to the students' performance in the examinations outside of educational instruction which are commonly overlooked in these kinds of studies. Results showed that there is a weak positive relationship between the socio-demographic characteristics and the scores in English, Science, and Math. Specifically, the degree program, institution, religion, residence, mother tongue and disability are weak determinants of the scores in these subjects. However, this should not be taken for granted, the weak relationship would tell us that these variables still have an impact to the competencies of the K-12 graduates. Based on these, the safe space environment, where everyone will feel included, and learning guide were developed.

Keywords: Competencies, intersectionality, K to 12 graduates, K to 12 program, general education

11:10-11:30

304 – Design and Development of Online Pre-Registration System for University of Southern Mindanao

Arjay S. Agbunag, Nelson Balneg Jr. and Ralph Butch Garidan

ABSTRACT. The Covid-19 pandemic has successfully forced global shutdown of several activities, including educational activities, and this has resulted in tremendous crisis-response migration of universities with online platforms. This also hinders the process of enrollment in the university. Part of the process in enrollment is the admission or registration of students' profiles. An online registration system eliminates the need of filling paper forms manually and sending them to a registration office. When using online registration systems, the participants can simply register at their convenience and submit their information immediately. Thus this study proposed an Online Preregistration System for the university. The system provided a way to minimize unnecessary contact and exposure to coronavirus. This study sought to develop an online pre-registration platform for the university. Specifically, it sought to implement an online pre-registration system for freshmen and transferee students; generate statistical report bases for decision making; and evaluate the developed system in terms of functionality, usability, and performance efficiency. The system was developed using an agile development methodology in the study. Phases including planning, designing, coding, and testing are part of this process. There were two (2) applications developed: Pre-registration, a web application written in the PHP language; and Enrollment Backend API, a web API written in C# on.NET 5. The enrollment API is responsible for accessing the enrollment database. All enrollment-related data access is required to pass through the API for portability and security. The pre-registration web app is responsible for implementing business logic for admission processes. Additionally, the researchers evaluated the current procedure to find potential solutions and brainstormed with a group of people to design the system.

Keywords: admission process, registration, online pre-registration

1:00-1:20

305 – Development and Implementation of Online Application for Graduation and Final Clearance System

Ryan Z. Gonzaga, Alvin C. Mibalo, Elizabeth R. Genotiva, Danilyn A. Flores and Nor-Aine M. Corpuz

ABSTRACT. The purpose of the research is to design, develop, and implement an online application for graduation and final clearance system for the University of Southern Mindanao. It aimed to transition the clearance process from paper-based to automated which will introduce a faster way of processing of application for graduation and final clearance. The following software and programming language was utilized in designing and developing the system; PHP,Javascript, Navicat, and MSSQL for its database. The developed system was presented to the university ARO director and the university registrar. After the testing was concluded, they suggested minor changes including the gender label. In conclusion, the system gained a positive response from the respondents. They both recommended that the developed system should be deployed and utilized.

Keywords: Development, Online, Clearance, Application for graduation, Innovation

1:20-1:40

306 – Project Title: USM-IPTBM Phase: II Patent Mining of Rubber Technologies thru Intellectual Property and Technology Business Management (IP-TBMP) Operations of the University of Southern Mindanao

Pia Amabelle M. Flores, Cyrelle M. Besana, Abegail B. Sauyen, Mark Henry F. De Leon

ABSTRACT. The Patent Mining project is a continuing project of IPTBM funded by DOST-PCAARRD from 2021-2022 pursuant to Republic Act NO. 10055. The project serves to satisfy the following objectives: 1) capacitate technology transfer personnel of the University of Southern Mindanao IP-TBM Office on patent mining; 2) investigate emerging rubber technological trends and recommend priority R&D programs through patent mining; 3) enhance IP policies and technology transfer protocols of other SUC's to harmonize IP management and technology transfer activities; and, 5) provide support to the development of the IP-TBM Real Time Monitoring System (RTMS). The project serves as breakthrough in accomplishing licensing agreements and executing "Fairness Opinion Report". The IPTBM was key in the first copyright registrations from IPOPHIL, trademarks from research- based technologies and enhanced the University's IP asset. Among the highlights accomplished through project includes: Five (5) USM OPV and Hybrid corn technologies assisted for licensing; enhanced IP asset with 10 registered Utility Models, 7 registered trademarks and 21 registered copyrights. The project conducted Consultation Meeting for Rubber Industry Strategic S&T Plan (ISP) which was participated by national industry partners, private sectors, technical experts, DOST-PCAARRD, IPOPHL and selected SUC's. The information gathered from the consultation were instrumental in the crafted "Commodity Report for Rubber" and partial "Patent Landscape Report for Rubber". The re-unveiling of the IP-TBM marker in its new venue at the USM DOST-PCAARRD Technology Center (DPTC) commemorates the collaboration of the two agencies to foster intellectual property and technology commercialization activities in the University.

Keywords: Intellectual Property, RA 10055, Research and Development, Technology Commercialization, Technology Transfer, USM IP-TBM

1:40-2:00

307 - Project Title: DOST PCAARRD and USM Agri-aqua Technology Business Incubator (USM-ATBI)

Pia Amabelle M. Flores, Jalaloden B. Marohom, Benjie B. Mari, Connie Jean J. Guinmapang, Joshua G. Canlas

ABSTRACT. DOST-PCAARRD and USM pioneers agri- aqua technology business innovation in the University pursuant to "Innovative Startup Act of the Philippines (RA 11337)" which aims to satisfy the following objectives, to: 1) capacitate USM ATBI personnel; 2) identify and establish partnership with the incubatees; 3) identify and establish linkages among agencies, clients, markets, and funding sources to sustain the operation of the ATBI; 4) provide technical assistance, business development services, marketing assistance, and administrative services to the incubatees; 5) enhance USM's technology transfer and product promotion efforts. USM ATBI paved way to the University's milestone of accomplishing it's first licensing commercialization for USM Corn OPV and Hybrid technologies. Through ATBI platform, the University's first Technology Licensing Agreement (TLA) and TBI Operation Manual was crafted which are important basis for licensing and agri- aqua innovation. At the moment, USM ATBI continually provides technical, business and marketing assistance to its 13 incubatees which ventures on banana floral apex tissue culture, halal chevon products, turmeric products, organic agricultural farm products, seafood ready-to-eat (RTE) products, rabbit farming, mushroom products, corn varieties/ technologies and agri-tourism ventures.

***Keywords*:** USM ATBI, RA 1137, Technology business incubation, commercialization, incubatee

2:00-2:20

308 – Integrating Gender and Development (GAD) Concepts Across Mandated Language, Literature, and Social Science Courses

April Rose T. Butalid, Elangbai K. Dimasingkil, Estella B. Barbosa

ABSTRACT. GAD integration or gender mainstreaming into the curriculum is a mandate among all Higher Education Institutions (HEIs); this ensures that gender issues are considered in the delivery of instructional goals and objectives with the aim of achieving and maintaining gender equality. This study has determined the practices on integrating GAD concepts and activities into the syllabi and classrooms among faculty members teaching language, literature, and social science courses. Specifically, the study has determined the practices and activities on GAD integration, identified the GAD concepts that are incorporated into the syllabi and classrooms, and recommended actions and processes for GAD mainstreaming into the university curricula and other instruction-related activities. Descriptive research design was employed in this study. Data were gathered using a survey questionnaire. Syllabi and modules were also used as secondary data to identify the GAD-related concepts integrated. Forty-four (44) faculty members from the University of Southern Mindanao served as the respondents of

the study. About 29.55% of the respondents were English language professors, 18.18% were literature professors, and more than half (52.27%) were social science professors. Results have revealed that practices and activities on GAD integration are usually employed, and GAD concepts are highly integrated in language, literature, and social science courses. Such practices include using gender-fair language in the classrooms, calling students regardless of their gender orientation to recite during the discussion, and explaining how the subject exposes the role of women in the society. Moreover, GAD concepts including roles of men and women, societal expectations, and women empowerment are always integrated into their classes. The respondents also have agreed that GAD-related policies concerning gender mainstreaming into the university curricula should be implemented. Therefore, strengthening the integration of GAD concepts and activities in instruction would help in achieving the vision of creating and sustaining a gender-responsive society.

Keywords**:** GAD concepts, gender and development, language courses, literature courses, social science courses

2:20-2:40

309 – PPMP Automation for Productivity Improvement of e-Admin Services

Eugene G. Ranjo and Arjay S. Agbunag

ABSTRACT. The project was conducted to develop an automated system for preparing and consolidating the Project Procurement Management Plan (PPMP) of the University of Southern Mindanao. PPMP is a guiding document in the procurement and implementation process in the university that serve as a vital reference to some research, offices, colleges, and other units as well. This serves also as an essential tool in the resource and financial management that allows the procuring entity to a flexible optimizing utilization of scarce resources. Some serious reason was identified for the preparation and consolidation of the PPMP. The main elements in the PPMP should be ensured and must be accurate and comprehensive because reflected estimation will serve as a basis for the generated future monthly and annually consumptions of supplies, materials, and other components from the PPMP that need to be consolidated manually and done for a couple of days to finish. That is why an automated system was planned to develop to attain the very tedious task in every preparation and consolidation time of PPMP. The accomplishment of the project showcased the final design of the PPMP automated system that was developed according to the gathered requirements like procurement procedures, problems encountered, and other details of the suggested interface and contents that were included in the system development. Moreover, to test the workability and accessibility status of the developed PPMP automated system an ongoing series of testing will be able to conduct to ensure that the automated system will deliver a most convenient working space in preparing and consolidating PPMP and provide a hassle free, fast, and accurate output to any users.

Keywords**:** procurement, annual planning, automation, system development, budget

3:00-3:20

310 – Sustainable Green Library of USM

Anita C. Sornito, Susan S. Martinez, Saque J. Amilbahar

ABSTRACT. Building energy profile, energy consumption and energy reduction are the primary concerns of the present research project. The project aims to make the USM Library (USM-KEPLRC) sustainable, green and resilient to uncontrollable change in local climate which is anchored to SDG-9. The research study applies a paradigm shift from the usual design, construct, operate, and maintain building structure. The project will be conducted for 3 years which started on the year 2022 with three components namely: study 1- SM Library Wind Simulation and Energy Consumption Reduction Formulation, study 2- USM Library Sustainable Horticulture and Landscaping and study 3 – Sustainable Green Library Programs and Practices. The research project will proceed from making a Building Information Model (BIM) of USM –KEPLRC, determining the energy profile and energy consumption, to horticulture landscaping and sustainable in the second year and sustainable program and policy making for the third year. The research project involves building modeling and energy simulation softwares. Data taken from the energy audit and softwares will be used to apply green initiatives like, horticulture and physical landscaping, and eventually use for program and policy making of the whole building. The result of this research project will have an impact on the measures and mechanism on making a structure green, sustainable and resilient to climate change.

Keywords: green library, sustainable library, USM BIM, energy audit, energy simulation

3:20-3:40

311 - Upgrading of Cacao Post-Harvest Processing Center Facilities of USM

Harem R. Roca and Sheena B. Lucena

ABSTRACT. A project was conducted with the general objective of upgrading the Cacao Post-harvest Processing Center at the University of Southern Mindanao through the physical rehabilitation of the existing cacao post- harvest processing building, acquire modern equipment and facilities, mechanize tablea processing, and support on-going and future cacao research activities. It has a duration of one year and is funded by DOST-PCAARRD-IDD with an appropriation of Php 5,000,000.00. The project was officially granted a one year extension by the funding agency. About 80% of the total number of equipment had been already delivered, installed and tested in two batches. Some are already used in tablea processing. The rehabilitation of the building started last April 2022 and is being undertaken by the USM Administration. When fully refurbished, the facility is expected to be operationalized for the production of high quality 'tablea', and at the same time as a shared facility for training, transfer of technology and for various research, development, and extension endeavors of the university.

***Keywords*:** cacao, equipment, post-harvest, processing, upgrading

3:40-4:00

312 – Upgrading of Tissue Cultures Facility in University of Southern Midanao

Mark Al-jamie J. Muttulani, Harem R. Roca, and Edward A. Barlaan

ABSTRACT. Tissue culture is an important technology to produce disease-free and high-quality planting materials for rapid production of many uniform plants. This technology has been used in mass production of planting materials for various economically important crops. This has been instrumental in supplying tissue-cultured banana planting materials in various banana growing areas in the Philippines. University of Southern Mindanao (USM) has tissue culture facility that becomes instrumental in training students, researchers and private enterprises engaged in tissue culture in banana and other crops. However, the current facilities for tissue culture and biotechnology in USM are already antiquated and inadequate to house many equipment. Thus, there is an urgent need to upgrade the tissue culture laboratory. The objective of this project is to upgrade the University of Southern Mindanao tissue culture laboratory with new facilities and equipment in tissue culture. It can also be a platform for research and production programs of USM and training for tissue culture and thesis of students both undergraduate and graduate students and other stakeholders.

***Keywords*:** Tissue Culture Laboratory, Upgrading

4:00-4:20

313 - Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao

Sandra Joy P. Pahm and Harem R. Roca

ABSTRACT. The High Value Crops Food Processing Center based at University of Southern Mindanao was established in 2012 with funds from the Department of Agriculture-Bureau of Agriculture Research (DA-BAR). It has become the processing center mainly for high quality turmeric tea and its variants and the production of the USM 'tableya' which are produced from home-grown cacao trees. The cacao trees were the result of various research and collaboration in the university with more than 100 varieties and accession of cacao are now being grown productively. Availability of efficient postharvest facilities are necessary for the development of the important characteristics and quality fine flavor beans. With the increasing supply of cacao beans for processing, it prompts the need to upgrade the Center which will be involved on improving and optimizing cacao postharvest operations such as fermentation, drying and roasting in response to the needs of the cacao farmers for appropriate technologies that are efficient, accessible and, affordable. Likewise, it is also important to acquire state-of-the-art equipment to be used in developing high quality chocolate products that are affordable to the ordinary Filipino consumer.

***Keywords*:** cacao, high value crops, processing, tableya

10:10-10:30

401 - USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat) RTE Products Component 6: Capacity Building on Fish Processing Food Safety at Ligawasan Marsh Community

Mary Joy S. Cañolas, Carlo K. Reston, and Pia Amabelle M. Flores

ABSTRACT. Pikit is one of the municipalities in Cotabato that shared the abundance of flora and fauna of Ligawasan Marsh. A variety of inland fish is caught by the tons every day with which mudfish (*Channa striata*) being the most abundant. Hot smoking of mudfish is one of the prominent enterprises along the national highway of Pikit, Cotabato. Thus, this component project aimed to (1) increase the capacity of the fish processor-entrepreneurs on fish processing food safety, (2) increase awareness of the techniques of fish smoking using wood chips, and (3) develop IEC print materials as a ready reference. Social preparation includes coordination and inception meetings, translation, and conduct of Training Needs Assessment (TNA) and validation, organizing, and profiling of the target beneficiaries. Training methodology includes lecture-discussion, techno-demo, and participatory sensory evaluation of smoked mudfish using hot and cold smoking techniques with different combusting materials. Distribution of certificates of completion and TeknoGiya leaflets were the highlights of the closing program. TNA results revealed that they had little/no knowledge of the brining and drying process. Post-test results increased while very satisfactory results were obtained for the resource persons and overall training activity evaluations. Significant differences ($P<0.05$) were observed in terms of firmness, taste, and general acceptability in favor of the cold smoking technique using wood chips. Majority of the beneficiaries were willing to buy cold smoked mudfish if available in the market.

***Keywords*:** Ligawasan Marsh, Future's Thinking, Protein, Ready-to-Eat (RTE), Food Security

10:30-10:50

402 - CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects

Tamie C. Solpot, Frederick B. John Navarro, Ivy Mar B. Cabornida, Pamela B. Villanueva

ABSTRACT. The COVID-19 has greatly affected the country and has caused loss of lives and disruption to the economy. Cacao (*Theobroma cacao*) is considered as one of the most important crops grown in the Philippines that could provide a potential source of income and have been acclaimed for many years for their health benefits. This project aims to address the limited good quality planting materials (QPM) of promising cacao clones to help strengthen the cacao industry by area expansion and promote cacao-based products as health food. A survey was done on cacao production practices and level of knowledge of local farmers and the health conditions of the local community. A total of 50 cacao farmer respondents were surveyed for the identification of training needs in selected municipalities of Cotabato. Majority of the farmer-respondents identified the following as their training needs which include technologies on cacao harvest and post-harvest practices (21.88%), harvesting and postharvest handling practices (21.88%), management of insect pest and diseases (16.67%), and crop and farm maintenance (13.54%). To date, 20 cacao farmers in Kidapawan City were

trained for cacao production and were given with QPM. Also, 100 household members were surveyed for their health status and level of knowledge on cocoa as health food from Dagupan, Kabacan. Feedback of the survey results were shared to the community and about 60 household members were trained on the importance of cocoa product as health food in the areas of Dagupan, Kabacan, and Ginatilan, Kidapawan City.

Keywords: Covid-19, pandemic, training, quality planting material, tablea

10:50-11:10

403 – SWIPE-Solid Waste and Integrating Program for E-Waste Disposal

Maricel G. Dayaday, Fredelino A. Galleto, Saque Amilbahar

ABSTRACT. The Solid Waste Integrating Program for E-waste Disposal (SWIPED) is a comprehensive extension project of the College of Engineering and Information Technology (CEIT), University of Southern Mindanao, Kabacan, Cotabato. Barangay Poblacion, Kabacan, Cotabato is the service are of the extension project. SWIPED seeks to assist the barangay local government units (BLGU) in managing the increasing amount of solid waste generated by the community. It seeks to raise awareness of the target barangay on the impact of solid and e-waste. It also helps the barangay officials in crafting ordinances in relation to e-waste management and the purok leaders to capacitate on the usage of the available bottle shredder of the barangay. The project supports the overall goal of helping local communities achieve their sustainability goals through upskilling of barangay local government unit officials (BLGUs) and purok leaders. The SWIPED aims to: 1) Increase awareness of e-waste management among beneficiaries 2) Craft policy recommendations for E-waste management 3) Develop crafts and other arts from e-waste products, including how to de-solder metal products from e-wastes 4) Training on operations of bottle shredder machine 5) Adopt the use of bottle shredder machine in the community as a source of livelihood. SWIPED project has conducted the following activities such as: a) E-waste knowledge survey; b) Launching of SWIPED; c) Community Awareness on SWIPED d) Training on Disassembling of E-waste components and arts and crafts development e) Training on Operations of Bottle Shredder Machine f) Training on Solid Waste for Construction g) Crafting of barangay ordinance.

***Keywords*:** Awareness, Bottle shredder, Construction, Electronics waste, Solid waste

11:10-11:30

404 – Tablea: Pangkabuhayan para sa kotabateñong Pamayanan A Community-based Tablea Production for Sustainable Livelihood in Cotabato

Ardniel A. Baladjay, Gwen Iris D. Empleo, Sheena B. Lucena, and Janice M. Bangoy

ABSTRACT. The COVID-19 pandemic negatively impacted the economic and agricultural sectors in the Philippines resulting in work displacement and loss of livelihood. These events opened opportunities to transform agriculture food systems including increased utilization of locally available food that would provide alternative sources of livelihood. Cacao (Theobroma cacao L.) is a highly valuable crop in the Philippine domestic and export markets. In Region 12, cacao production is projected to increase which provides opportunities for sustainable livelihood to Cotabateños. This one-year project funded by DOST-PCAARRD aimed to 1)

capacitate cacao farmers, tablea makers, and displaced workers in selected cacao growing municipalities of Cotabato on cacao pre- and post-harvest processing, tablea production, packaging, and marketing; 2) promote the mature technology on tablea production using USM practices for adoption; and 3) generate additional income for the beneficiaries. The USM Tablea Team, in coordination with the LGUs of Antipas, Tulunan, and Aleosan, Cotabato identified three associations of cacao farmers: Municipality of Antipas Kakao Growers Association, Inc. (MAKGAI), Aleosan Cacao Farmers Association (ACFA), and Tulunan Cacao Growers Association (TCGA). The respective association leaders facilitated the selection of ten members who underwent capacity building while the USM Tablea Project Team carried out the development of six training modules for various project activities. The Team was able to conduct on-site training using lecture-method demonstrations. An intervention was afforded through common facilities and equipment support to three associations to ensure continued tablea production in their respective locality and to sustain the supply to the target market.

Keywords: Cacao Farmers, Cacao Production, Community-Based Production, Sustainable Livelihood, Tablea

1:00-1:20

405 – Development of Video Materials on Organic Production of Indigenous Vegetables for Dissemination

Gelyn V. Amilbahar, Tamie C. Solpot, Josephine R. Migalbin

ABSTRACT. To address the new trend of today's society which strongly demands a new technology, Video materials in extension are very relevant especially in terms of technology transfer and information dissemination. This project served as a medium of Information dissemination of the University of Southern Mindanao, particularly from the College of Agriculture which aimed to informed the local communities or service areas of the University to help achieve self reliance towards indigenous vegetable production, ensure food security, and improve productivity of vegetables among local households and schools. On the other hand, Food security is a major concern not only in the Philippines but also to other countries. In order to alleviate the problem in food security, backyard farming is one of the technologies that can produce food under adverse condition and can be done at home with less effort. The main purpose of this project is to help alleviate the effects COVID-19 pandemic by showcasing indigenous organic vegetable garden model and video production on the utilization of the indigenous vegetables in the University of Southern Mindanao. The project has the following objectives, set up- a model garden for organic production of indigenous vegetable, develop at least 5 video materials in organic production of indigenous vegetable and, disseminate at least 5 video materials on site and social media platforms . The project paved the way to established a model garden that showcased indigenous vegetable like kadyos, native talong, Kangkong, native ampalaya, kulitis, alugbati, pulang kamote and saluyot . Moreover, the development of five (5) video materials were also done with five different contents namely; Nutritional Benefits of Indigenous Vegetable, Urban Gardening, Indigenous Vegetable Recipes, Model Garden for Indigenous Vegetable and Modified FPJ Concoction. Finally, Dissemination of the video materials were successfully done through its respective clienteles to which, it was rated as very informative and has a very satisfactory rating.

***Keywords*: Food Security, Information Dissemination, Indigenous Vegetable, Organic Production, Video Materials**

1:20-1:40

406 – Gender Research and Capability Building in Extension

Glyn G. Magbanua

1:40-2:00

407 – Community-based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal kagikit for Certification

Analyn A. Gonzales, Jeannie U. Duka, Lian D. Bagonoc, And Jay-R G. Vildac

ABSTRACT. The College of Business, Development Economics and Management through its extension and community services is guided by its mission for community development through advocacy, technology transfer, consultancy and other support services. Through the help of the CBDEM extension project of USM, the Community-Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Kagikit for Certification, the Kayaga Women's Association will produce kagikit product for commercialization. The college believes that it has the economic advantage that will help both Maguindanaon and non-Maguindanaon entrepreneurs, investors, and advocates. The college conducted needs assessment and profiling of 25 beneficiaries, signed Memorandum of Agreement between Barangay Kayaga and USM-CBDEM, capacitated the partner community through technical training, and produced financial management training module. Through the help of the college, the partner community is now a certified association of the Department of Labor and Employment (DOLE). Moreover, the AgriBusiness Department spearheaded the product testing using the sensory evaluation criteria such as appearance, aroma, taste and texture, the research instrument employed a 9-point rating scale with 1 as the lowest and 9 as the highest. Overall, the general acceptability of the product was evaluated as "Like Extremely" by 115 respondents.

***Keywords*: Collaboration, development, economic, management, promotion**

2:00-2:20

408 – Development of Community Based Tourism in Kabacan, Cotabato

Meldred F. Samblaceno, Rosyell Angelo N. Piosca and Urduja G. Nacar

ABSTRACT. Community-based tourism (CBT) has been popular to many areas in the Philippines like Puerto Prinsesa, Palawan and Lake Sebu, South Cotabato. It underlines the involvement of local residents in the management and development of the community, on the environment, respecting their cultures and contributing to the economic and social well-beings of the host community. According to Lo and Janta, (2020), CBT aims to accomplish four goals: (1) resource conservation: preserving cultural and natural resources by having a positive impact

on the community; (2) socio-economic development: allowing the community to balance costs and benefits; (3) community empowerment and identity: strengthening community identity through meaningful activities that allow residents to own and recognize their local identity; and (4) high-quality visitor experiences. Kabacan, also known as the "source of abundance," is visited by many from neighboring towns for the Pisan caves, the University of Southern Mindanao, and the Kapagayan Festival. The project entitled “Development of Community-based Tourism in Kabacan, Cotabato” was intended to assist the community in the development of Community-based Tourism. Specifically, it aims to; produce promotional tools; organize and capacitate the target beneficiaries as Gabay Turista or University Guide; and to disseminate the promotional tools to varied stakeholders for assessment and critique. A permission letter on proposal presentation was sent twice to the office of the Mayor. The first letter dated April 21,2022 was sent to Mayor Herlo P. Guzman then, received but was not entertained due to election-related issues and change of administration. With the team’s determination, a permission letter was sent again to the newly-installed Mayor Evangeline P. Guzman, dated July 13,2022. After two weeks of waiting, the letter was finally endorsed to the LGU-Kabacan Administrator Ben Guzman and to the municipal tourism office. The proposal was initially presented last July 26, 2022 to Mr. Francis Merillana, the tourism-office in-charge. Memorandum of Agreement (MOU) was crafted and presented in a meeting with Mayor Evangeline P. Guzman, Administrator Ben Guzman, Rhosman S. Mamaluba, the OIC-Head, Tourism Office and Francis Merillana, the Tourism office staff, last November 17,2022. Suggestions from the LGU were incorporated on the specific responsibilities of both parties, such as the cultural mapping and museum management. A special meeting was also set for the final crafting of the MOU. Analysis of the tourism assets was also done to determine the strength, weakness, opportunities and threat (SWOT) of the tourism industry in Kabacan, Cotabato thru an interview with Rhosman S. Mamaluba, the OIC-Head, Tourism Office and Francis Merillana, the Tourism office staff, last October 21,2022. Findings revealed that the University of Southern Mindanao and Pisan Cave were the existing tourist attraction, while the fish landing center in Cuyapon, IP community, antique collections of the Mantawil Family, Pisan rock formations, crocodile sightings in Cuyapon, water hyacinths products and native delicacies were among the potential points of interest in the future. Available community-based tourism assets were also noticeable in the area, such as restaurants, check posts, bridges and roads, sunset and sunrise spots. Potential natural features were also enumerated such as varied landscape, forest and vegetation and river.

Keywords: instructional

2:20-2:40

409 - Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS Plans) (Phase 2: Facilitating Independent Learning and Teaching in the New Normal)

Leorence C. Tandog, Debbie Marie B. Verzosa, Philip Lester Benjamin, Daryl Mae Mamon, Anna Jean Garcia, Rowel Madio, Leonard Paleta, Roel Valenton and Florie Jane Tamon

ABSTRACT. Filipino learners perform poorly in international assessments in mathematics and literacy. The problem is exacerbated by the Covid19 pandemic which disrupted face-to-face classes starting 2020. Teachers expressed the need for training in developing materials for

blended learning. This extension project, which started on April 2022, aimed to utilize and validate print materials such as comic strips, activity sheets, and posters; and to capacitate teachers in developing appropriate materials which target foundational content knowledge in elementary, and mathematical knowledge in high school. An initial training was implemented on April 30, 2022 via Zoom, attended by 24 elementary and 87 high school teachers. Participants learned, about research-based teaching strategies, and were tasked to develop learning materials as part of a professional learning community. For elementary school, Fraction Comic Books developed during the first phase (in 2021) were validated by 20 teachers who found them to be accurate, logical, and appropriate for learners. Teachers also learned how to create picture books and math posters for teaching elementary school content. For high school mathematics, eight groups of ten members meet regularly online to develop and refine research lessons with one subject expert coming from the Department of Mathematics and Statistics. By the end of the year, two picture books and 10 math posters for elementary school, and 2 refined lesson guides for high school mathematics are expected to be completed. It is expected that these materials can be used even when regular face-to-face classes resume.

Keywords: instructional materials, lesson study, mathematics, picture books, professional learning community, teacher training

3:00-3:20

410 – "Inpograp ng mga Inpormasyon Hingil sa Omicron Variant para maiwasan ang pagkalat ng COVID-19 at ang Benepisyo ng Pagbabakuna: Isang Teknikal na Pagsasalin"

Radji A. Macatabon Normie G. Pabinal Sandra M. Paidomama Dyane Reah B. Bana-Ay Gemcarl Rufer Dyan B. Galang

ABSTRACT. Ang proyekto na ito ay pinamagatang "Infograp ng mga impormasyon hinggil sa omicron variant para maiwasan ang pagkalat ng covid-19 pandemya at benipisyo ng pagbabakuna: Isang Teknikal na pagsasalin." Ang proyekto na ito ay tungkol sa pagsasalin at pagbuo ng polyeto hinggil sa COVID-19 pandemya. Ang pangkalahatang layunin ng proyektong ito ay, maisalin at makabuo ng isang polyeto na naglalaman ng mga patnubay para maiwasan ang pagkalat ng COVID-19 pandemya na nakasalin sa wikang Blaan, Teduray, Maguindanawn, Erumanen ne Manuvu at Tagakaulo. Sinaklaw ng proyekto na ito ang paglilikom, pagsasalin at pagbuo ng polyeto bilang kagamitang impormasyon para maiwasan ang pagkalat ng COVID-19 pandemya at halaga ng bakuna. Ang proyekto ito ay may kuwalitatibong desinyo na kung saan ginamit na batayan sa pagsasalin ang Meaning-based translation ni Larson (1984) na nagpapahayag na sa pagsasalin mas mahalagang maisalin ang diwa at hindi ang salita. Ginamit din bilang dagdag na batayan sa pag-aaral na ito ang teoryang Skopos ni Hans Vermeer (1978) na nagsasabing mahalagang malaman ang layunin ng pagsasalin. Ang isang malinaw na pagpapatupad ng aksiyon ng pagsasalin ay pagkilos ng tao na naayon sa taglay na intensyon sa pagsasalin. Ang pagpapaandar ng isang pagsasalin ay nakasalalay sa kaalaman, mga inaasahan, halaga at pamantayan ng mga target na mambabasa na muling naiimpluwensyahan ng sitwasyong kanilang naroroon at ng kultura. Batay sa naging resulta ng proyekto, ito ay nakabuo ng mga polyeto, ang Teduray, Maguindanawn, Tagakaulo, Eremanen ne Menuvu at Blaan. Masasabing marami ring mga salita sa wikang Filipino na hindi matutumbasan sa mga nabanggit na wika. Ito'y isa sa mga karaniwang suliranin sa pagsasalin ng tekstong siyentipiko/teknikal na kung saan tinawag ni Mona Baker sa kanyang "In Other Words" (1992) na problem of non-equivalence: source language concept not lexicalized in the

target language na nangangahulugang ang teksto ay walang katumbas na salita sa tunguhang lengguwahe ang konsepto sa simulaang lengguwahe. Maaari ring magamit ang bernakular na wika sa paghahatid ng impormasyon hinggil sa pangkalusugan sa paraang lalong maunawaan ng maraming mamamayan.

Keywords: Polyeto, COVID-19, pandemya, teknikal na pagsasalin, Wikang Teduray, Magindanawn, Tagakaulo, Blaan at Erumanen ne Menuvu.

3:20-3:40

411 – Strengthening Functional Literacy through Interactive Video Lessons (IVL) in Barangay Cuyapon, Kabacan, Cotabato

Ellen Joy M. Farala, Faith P. Buned, Bailyn M. Mantawil, Jay G. Regulacion

ABSTRACT. Functional literacy is defined as the practical skill set required to read, write, and perform math for real-life purposes so people may function effectively in their community. The College of Education through its Literacy Numeracy in Barangay Cuyapon (LITNUMBARCU) in 2018 conducted series of activities to teach all age-groups from the community to help increase the literacy rate in the community. However, literacy rate in the community is still 5.55% among the persons surveyed aged 10 and above from 2017-2019 according to data from Municipal Planning and Development Council Office. This project was proposed to strengthen the functional literacy rates of school-aged children in the community from Kindergarten to High School. Profiling of respondents was done among 72 learners. Results revealed that biggest percentages of students struggled in the subjects English, Filipino, and Math, with 36.11%, 45.83%, and 37.5%, respectively. Series of basic reading activities were conducted every Friday afternoon using Science Research Associate (SRA) and Marungko approach in reading via face-to-face teaching. Post-test results revealed that learners improved 1 step higher from being unable to recognize letters to beginners in early grades (blending of sounds up to reading simple phrases) and beginners to developing readers from Grades 6-10 (Reading and comprehending short stories) in terms of reading and comprehension. Positive feedback coming from the participants, including their parents, was also gathered. The college is committed to continue its efforts to help the community reach its maximum functional literacy and will include adult learners as additional participants.

Keywords: Functional literacy, SRA, Marungko Approach,reading comprehension

3:40-4:00

412 – CTI Capacity Building for Barangay Pisan: Pinning Intellectual Skills and New-Tech (PISan)

JP E. Fortinez and Rene C. Cabahug Jr.

ABSTRACT. This project "CTI Capacity Building for Brgy PISAN: **P**inning **I**ntellectual **S**kills **a**nd **N**ew-tech" or simply "PISaN project" intends to deliver technical services and empowerment to the Barangay Pisan community supposedly from January 1, 2022 to December 31, 2022 through three components. The first component focuses on capability building with skills training in defensive driving and welding and fabrication, and empowerment via a values strengthening seminar. The second component focuses on the skills

assessment wherein the selected beneficiaries showcase their skills learned through a return demonstration and possibly a functional fabricated product. The third component focuses on community engagement in livelihood opportunities through services and product display. PISaN project's extension methodology is categorized into pre-implementation activities, implementation activities, and post-implementation activities. Currently, social preparation, specifically coordination and consultation with the community leaders as part of the pre-implementation activities has been conducted. Since all three components are yet to be implemented, catch-up plans are prepared to be executed in the first half of 2023.

Keywords: Capability Building, Skills Training, Defensive Driving, Welding, Fabrication

8:40-9:00

113 - Potential Use of BCA, Bio-stimulants and Water Management in Diseases of Dragon Fruit

Jasmin Pecho and Tito Jun T. Tidula

ABSTRACT. Potential Use of BCA, Bio-stimulants and Water Management in Diseases of Dragon Fruit Jasmin A. Pecho and Tito Jun T. Tidula Continuously increased planted area of dragon fruits (*Hylocereus undatus*) indicates great potential as a commercial crop. Fruit production is a promising means, especially with proper water management, of raising the income of farmers in the Philippines. However, dragon fruit diseases specifically canker caused by the fungus *Neocytalidium dimidiatum* may hinder production and in worse cases entirely wipe out the plantation. Therefore, this study is conducted to determine the effects of BCA with bio-stimulants to minimize disease incidence and water management on the growth and yield of dragon fruit. Dragon fruits planted at the CA-SDC-USMARDC were utilized to conduct this study. The soil texture of the location was determined using the sieve analysis while soil characteristics specifically the field capacity using SPAW. Due to the heavy rainfall, the study area experienced waterlogging which greatly affect the growth and evenly caused the death of affected plants. Thus, proper drainage improved crop status and even prevent the further possible spread of disease carried by surface runoff.

Keywords**:** bca, bio-stimulants, dragon fruit, *Neocytalidium dimidiatum*, water management

9:00-9:20

114 - Trait Enhancement of USM Varieties and Family Selections with Herbicide and Corn Borer Resistance

Efren E. Magulama, Jessie G. Elarde, Ferdinand A. Duldulao and Marry Grace S. Balbuena

ABSTRACT. The project generally aimed to enhance the selected USM varieties and families with glyphosate and corn borer resistance traits with specific objectives of (1) to validate the yield potential and herbicide resistance of USM varietal hybrids, (2) to select promising advance lines with resistance to herbicide and corn borer from the segregating population of maize, (3). to improve the parental lines of USM var 33 and 35 with herbicide resistance trait, and (4) to establish DNA fingerprint of USM var 33 and 35 which serve as molecular identity. The four component studies of the project are still on-going. In study 1, the three varietal hybrids were formed, and they are currently being evaluated for yield test. For screening of glyphosate tolerance, all the varietal crosses showed 99% plant survival 14 days after glyphosate application. For study 2, 512 S5 ears were generated from five population sources. In study 3, six BC1F1 backcross populations were formed and the six BC2F1 populations are currently being formed. For study 4, molecular markers for USM var 33 and 35 are currently being screened for parental identity.

Keywords**:** corn borer, herbicide, maize, SSR makers and varieties

9:20-9:40

115 - Use of the Triple Crop System in Enhancing Resource Use Efficiency and Crop Productivity in Corn

Baser L. Mamalac, Efren E. Magulama and Nenita E. Olero

ABSTRACT. The corn-based intercropping system is one of the strategies that can help small-scale farmers to maximize yield productivity and profitability. The project is conducted specifically to determine suitable companion crops for corn in a triple crop system, identify suitable genotypes of companion crops in a triple crop system, establish sowing dates of companion crops of corn in a triple crop system, and evaluate the productivity and economic profitability of triple crop system. All project components are still ongoing. The experiment was carried out in a randomized complete block design with three replications. For treatments, component 1 consisted of six kinds of crop combinations and the sole crop of each companion crop. For component 2, the treatments were composed of two varieties of each companion crop for the crop combinations while for component 3, the treatments were composed of seven sowing dates of companion crops. Initial data on growth and yield parameters were already gathered particularly for corn and string beans.

***Keywords*: Triple crop system, companion crops, sowing dates, resource use efficiency, crop productivity**

9:40-10:00

116 - Prevalence and Molecular Characterization of Gastrointestinal Parasites in Human-macaque Interface: the case of Hindang, Leyte and New Israel, Makilala, North Cotabato

Lothy F. Casim, Leanne Jay S. Manceras, Cyrelle M. Besana, Fritzie S. Sia, and Augustus Oer V. Silapan

ABSTRACT. This study aims to investigate the occurrence of gastrointestinal parasites (GIT) in the human-macaque interface of New Israel, Makilala, and Hindang, Leyte, using a One Health approach. The prevalence and intensity of parasites in long-tailed macaques, residents, and the environment were investigated by means of non-invasive parasitological techniques. The study also determined the associated risk factors and the possible cross-transmission of parasites using conventional and molecular techniques. In Leyte, an overall prevalence of 100% for gastrointestinal parasites was obtained in both macaque troops. Parasites identified include nine (9) protozoans (*Balantidium coli*, *Blastocystis* spp., *Endolimax nana*, *Entamoeba coli*, *Entamoeba hartmanni*, *Entamoeba histolytica*/dispar, *Entamoeba polecki*, *Iodamoeba butschlii*, and *Isospora* sp.) and one (1) helminth (hookworm). In New Israel, a total prevalence rate of 98.33% was recorded. All protozoans detected in Leyte (except *Isospora* sp.) were also observed in macaque fecal samples from New Israel. However, there were 3 additional helminths found, these are *Ascaris lumbricoides*, *Strongyloides* spp., and *Trichuris trichiura*. Protozoans had the highest intensity and prevalence observed in both sampling areas. Analysis of the water samples revealed that there were two (2) sites contaminated with parasites (*Balantidium coli*, *Blastocystis* sp., & *Iodamoeba butschlii*) in New Israel. However, no parasites were detected in environmental samples from Leyte. With regards to human fecal samples, 5.3% and 7.3% were infected with gastrointestinal parasites in Leyte and New Israel,

respectively. Species recovered from human samples were *Ascaris lumbricoides*, hookworm, and *Entamoeba coli*. Moreover, analysis of the association between the sociodemographic & KAP of participants to the GIT prevalence identified 8 variables that were significantly associated (p= <0.05) with the occurrence of the parasitic infection in both areas. In addition, the team conducted data dissemination, awareness campaign, and policy formulation with LGUs & local constituents regarding macaque management, conservation and public health protection.

***Keywords*: gastrointestinal parasites, humans, KAP, macaques, prevalence**

10:20-10:40

117 - Assessment of Wildlife Encounters, Rescue and Training in Protected Biodiversity Landscapes of North Cotabato

Florence Roy P. Salvaña

ABSTRACT. Understanding processes like encounters, rescue and trading is an important aspect of holistic wildlife conservation. This study was conducted to assess wildlife encounters, rescue and trading in protected biodiversity landscapes of North Cotabato. A study presentation was conducted in the 1st quarterly meeting of PAMB-MANP to secure necessary permit. A survey was conducted to DENR, PENRO and CENRO- Matalam to gather information on the recorded encounter, rescue and trading of wildlife species. Records from these offices were also accessed to determine which wildlife species are commonly encountered, recued and traded. Most the encountered and rescue wildlife species are birds from 2020-2021. Other recorded wildlife species include flying foxes, Philippine tarsier and snakes. Poaching and trading of wildlife species were also recorded. Flying foxes and birds were commonly poached and traded wildlife species. Wildlife encounters and rescue were recorded in Kidapawan, Arakan, Magpet, Matalam and Mlang which are part of protected landscapes such as Mt. Apo Natural Park (MANP), Mt. Sinaka and Ligawasan Marsh Bird and Wildlife Sanctuary. Preliminary data gathered and encounters and rescue in Libungan-Alamada Natural Biotic Area (LANBA), Banisilan and Kabacan include 2 species of hornbill, 1 individual pythons, 2 individual grass owls, 2 monitor lizards, two, 2 species of flying foxes (with greater concentration in Banisilan), 2 juvenile herons and 2 raptors (Brahminy Kite & Pinsker's Hawk Eagle) and 1 tarsier from 2019-2022. Most of the common traded wildlife species include bats and wild boars in Kabacan in Banisilan, and deers and avian species in LANBA based on the information given by CENRO personnel.

***Keywords*:** wildlife, encounter, rescue, trading, biodiversity

10:40-11:00

118 - Project 4. Disease Profile in Rubber-based Farming System in Southern Philippines

Joan P. Sadoral, Purificacion O. Cahatian, and Armando G. Valiente

ABSTRACT. A study was conducted to assess and identify diseases of rubber and intercrops; and to compare disease profiles of different rubber-based cropping systems at Australian Centre for International Agricultural Research (ACIAR) experimental area, University of

Southern Mindanao Agricultural Research and Development Center (USMARDC), Kabacan, Cotabato from February 2020 to January 2022. Disease assessments for rubber and perennial intercrops (banana, lanzones, coffee and cacao), annuals such as cassava and eggplant, corn and mungbean were carried-out at four, two- and one-week interval, respectively. Results of the study showed that across different cropping systems (rubber + banana + annuals; rubber + lanzones + annuals; rubber + cacao + annuals; rubber + coffee + annuals; rubber mono + annuals) the most prevalent disease affecting rubber was bird's eye spot. The disease was noted to occur starting three months after field planting (MAFP) up until 26 months. Other diseases were also found to occur in the area like algal leaf spot, powdery mildew, wrikle spot-like disease, leaf blight, leaf spot, leaf fall and stem disease. Moreover, perennial intercrops were affected with the occurrence leaf diseases such as black sigatoka, freckle and cordana in banana; leaf blight in lanzones; algal spot, anthracnose, and rust in coffee; leaf spot/blight and vascular streak dieback (VSD) in cacao. Leaf diseases were also found to infect annual intercrops such as cassava, eggplant, corn and mungbean. Keywords: disease assessment, disease identification, crop diversification, management approaches

Keywords: disease assessment, disease identification, crop diversification, management approaches

11:00-11:20

119– CornLai: USM Agri-based initiatives in Food Security During Pandemic Crisis

Jeannie Duka, Maribelle Piamonte, Nenita Olero, Efren Magulama, Renel Alucilja

ABSTRACT. The study was conducted to promote glutinous white corn and adlai as alternatives to rice consumption to address food security during the pandemic crisis. The study will address food security and nutritious food access in times of pandemic crisis, maximize the land area for corn production through backyard gardening, and provide livelihood opportunities for the local communities. USM agri-based initiatives in this project included the production of corn and adlai, and innovation of food products from these cereals. IEC materials were developed on corn production and cereal preparation for consumption. Glutinous corn seeds and IEC materials were distributed to 200 farmers in North Cotabato during the pandemic for backyard garden production. A model small-scale irrigation solar system was developed to demonstrate the increase in yield of corn in backyard production in conditions where water source is deficient due to climate change. Germplasm collections of adai in this study for seed generation were ginampay, gulian, kiboa, pulot and tapol varieties, and the agro-morphological traits of these varieties were described. Data were collected on the awareness and acceptance of the community in North Cotabato on adlai production and corn-based food products. Majority of the respondents were not aware and had not tasted the adlai, however, they are willing to consume adlai and corn-based products (CornLai). Furthermore, this project had developed adlai-based and corn-based products such as adlai beverage and Adlai patil.

Keywords: acceptability, awareness, CornLai, food security, Germplasm, solar irrigation system

11:20-11:40

120 – "MECO-TECO" Joint Research Project: Improvement of Carabao Mango Production and Fruit Quality through Quantitative Trait Loci (QTL) Identification for Scab and Stem-End Rot Resistance by Genome Wide Association Studies (GWAS)

Edward A. Barlaan, Joan P. Sadoral, Joellee L. Aguirre and Jaried B. Vergara

ABSTRACT.
Mango fruit production and marketability are adversely affected by fruit diseases like stem-end rot and scab. The study aimed to generate molecular markers associated with scab and stem-end rot resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utilization in marker-assisted breeding in 'Carabao' mango. Different mango accessions were tagged and evaluated for their resistance to stem-end rot and scab disease. Twenty-seven 'Carabao' mango varieties were inoculated with causal pathogen of stem-end rot disease and assessed based on the degree of infection. All 'Carabao' mango varieties were susceptible to stem-end rot disease. For scab, attempts were made for isolation, inoculation, infection of causal pathogen, and evaluation of mango varieties for resistance. Development and design of molecular markers was done as an option to detect *Elsinoe mangiferae* (causal pathogen of scab disease) in leaf samples. Forward and reverse molecular markers were developed and validated using subcultures of suspected E. mangiferae isolated from leaf samples affected by scab disease. In addition, in situ inoculation was done as an alternative option for evaluation of resistance against scab disease. Twenty-one 'Carabao' mango varieties were grafted and used as samples for in situ evaluation of resistance against scab disease. Alternatively, evaluation of resistance against scab disease on 'Carabao' mango varieties was done under natural field conditions. Twenty-one 'Carabao' mango varieties were evaluated for its resistance against scab disease. Results revealed that all 'Carabao' mango varieties were susceptible to scab disease. DNAs of 69 'Carabao' mango accessions were extracted, purified and quantified for GBS library construction and bioinformatics analysis.

Keywords: Mango, Genotyping-by-sequencing, Genome Wide Association Studies, Stem-end rot

11:40-12:00

121 - Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS and Genom-wide Association Studies (GWAS)

Edward A. Barlaan, Joellee L. Aguirre, Jaried B. Vergara and Evelyn Alejandro

ABSTRACT. Mango production in the Philippines is constrained by post-harvest diseases affecting fruit quality and yield. These diseases include stem-end rot (SER) caused by *Lasiodiplodia theobromae* and scab caused by *Elsinoe mangiferae*. There is a need to identify sources of resistance to these pathogens from various mango strains, cultivars and varieties to improve the Philippine 'Carabao' mango for resistance to SER and mango scab. The study aimed to isolate and molecularly identify the causal pathogens and develop molecular markers associated with scab and SER resistance in mango using genotyping-by-sequencing (GBS) and genome wide association studies (GWAS) for utility in marker-assisted selection/breeding. Besides 'Carabao' mango, other mango cultivars were used as potential source of resistance to SER. One-hundred one other mango cultivar trees were tagged for molecular analysis. Eighty-two mango fruits derived from Guimaras and Regions X, XI and XII were inoculated in vivo

with stem-end rot. Two mango cultivars were identified resistant to SER, namely, Huani and Irwin. Since the claimed causal pathogen of scab, *E. mangiferae*, could not be proven or reproduced, reactions to scab among mango cultivars were assessed based on field or natural conditions. Of the fifty-two mango cultivars evaluated, one cultivar showed resistance to scab. Alternatively, efforts were exerted to identify potential causal pathogen of mango scab. Fungal isolates were obtained from the typical symptoms of scab for morphological characterization, molecular identification and pathogenicity tests. A total of eighteen prospective mango scab isolates were molecularly identified. Pathogenicity tests on leaves for these isolates are still in progress.

Keywords**:** Genotyping-by-Sequencing, Genome Wide Association Studies, Mango, Stem-end rot, Scab

8:40-9:00

213 - Production, Commercialization & Technology Transfer of Kuliva Ice Cream

Leila S. Moscoso, Ardniel A. Baladjay, Ian Jade A. Flores, Avagale S. Roy

ABSTRACT. The Kuliva Ice Cream was tested for consumer preferences by 300 panel of evaluators. Thirty four percent (34%) preferred to eat the ice cream very often , almost 26% would like to eat this now and then , while 1.8% would like to frequently eat the said product. The original design of the label was revised from on "ice cream bar" to a "scooped ice cream" to make it more enticing. Initial product marketing was done during the Techno forum Exhibit at the USM Commercial building. As part of the 68th founding anniversary. Per serving of the ice cream contributes around 15% of the individual's daily need for Calcium, 25% for Vitamin A, and 14% for Vitamin C.

***Keywords*:** Ice Cream, Kulitis, Sensory Quality, Stabilizer, Nutritional Value.

9:00-9:20

214 - Development of Rice Topping Product- ''kagikit'' –From Chicken Meat

Julius Jerome G. Ele, Elma G. Sepelagio, and Jalaloden B. Marohom

ABSTRACT. "Kagikit" is a Maguindanaoan word used to describe sumptuous marinated chicken flakes that serve as the toppings of pastil. Chicken meat is considered as a primarily source in making "Kagikit". The study is being conducted to evaluate the chicken meat in making "Kagikit" from the different types of chicken meat available in the market which are broiler, cull, native, and Paraoakan-cross. Moreover, different cooking oils were also utilized including canola oil, corn oil, palm oil, and vegetable oil in making the "Kagikit". Furthermore, the different methods of preparation including flaking, shredding, grinding, and chopping was done. The "Kagikit" products were evaluated and a 5-point hedonic scale was used to determine the acceptance rating for appearance, color, flavor, juiciness, aroma, texture, and tenderness. The sensory evaluation results are being analyzed using a Kruskal-Wallis test with 30 board of tasters as evaluators. The "Kagikit" was evaluated based on the standard microbiological assay done in chicken meat. A total of 12 treatments were subjected to microbial evaluation namely total plate count, yeast and mold count, Total coliform count, Escherichia coli, and Salmonella detection using the Bacteriological Analytical Manual protocols. The laboratory test was conducted at the USM-CAS BIODEP water testing laboratory. The survey was done to random individuals from the three Municipalities in North Cotabato (Midsayap, Kabacan, and Kidapawan City) to determine the market and willingness to pay of consumers of the product "kagikit". Four different label designs were made and evaluated by the respondents. The four label designs were submitted for registration to the IPO-Phil. through the IPTBM office. Statistical analysis will be done using Descriptive and MRA. The production cost of the product "Kagikit" will be computed to determine the price allotted to the product.

Keywords: chicken, kagikit, microbiological assay, respondents, sensory evaluation, survey

9:20-9:40

215 - Processing and Packaging of Chevon Products

Ivy Mar B. Cabornida, Maribelle T. Piamonte, Ian Jade A. Flores, Lowie Jay P. Garino

ABSTRACT. Goats play a major role as a source of food and income. They have a very important role in meat consumption around the world, since goat's meat (chevon) is particularly healthy, nutritious and is exceptionally low in calories compared to other meats. Processing will add value and improve their quality and functionality for their intended use, however, currently, no existing food processors of chevon in Region 12 and only few processed chevon products were developed but not yet commercialized. Hence, developing more convenience chevon meat products for wider market niche is necessary so consumers can be offered with variety of choices for their lifestyle. The development was conducted in three stages: screening & formulation, quality evaluation and initial shelf-life study. Three (3) different chevon products were developed: Ready-to-eat (RTE) chevon tocino, chevon meat floss and chevon chicharon. These products were assessed to have a "like very much" sensory acceptability level of 7.83 - 8.30 by a panel of 30 evaluators using the 9-point hedonic scale rating. Moreover, the RTE chevon tocino packed in vacuumable polythene bag as primary packaging and placed in brown kraft bag had a pH of 5.46-5.55, TSS of 7-10˚Bx and water activity of 0.73-0.77; Chevon meat floss packed in half window brown kraft bag had a pH of 5.59-5.72, TSS of 13.2-14˚Bx and water activity of 0.63-0.66 and Chevon chicharon packed in the full window brown kraft bag had a pH of 7.24-7.29, TSS of 0.4-1.2˚Bx and water activity of 0.64-0.67. The packaged chevon products had initial shelf-life of about a month under ambient condition with acceptable microbial properties in terms of aerobic plate count and yeast and mold count.

Keywords: Chevon, Packaging, Processing, Sensory, Shelf-life

9:40-10:00

216 – Development of Diversified Products and Smart Packaging for Tinahito Brand of Smoked Catfish (*Clarias Gariepinus*)

Pia Amabelle M. Flores, Maricel G. Dayaday, Fredelino A. Galleto

ABSTRACT. The present study aims to improve smoked catfish (Clarias gariepinus) through product diversification and smart packaging. This is to address previous feedback in the product form and appearance to cater to wider scope of market segment. Diversified products were already developed including vacuum- packed products for smoked dried catfish in whole and filleted form as well as smoked fried catfish in whole and filleted form. Data on sensory evaluation followed complete randomized design and analyzed by using one-way analysis of variance. Tukey's test was used to compare differences at $p<0.05$ significance level. Findings indicate that packaging significantly affected appearance and general acceptability of the product ($p<0.05$). Vacuum- packed smoked whole catfish was significantly appealing compared to vacuum- packed fillet with bones, although it seems to be comparable with vacuum- packed fillet smoked catfish. Results in the general acceptability of the product indicated vacuum- packed smoked whole catfish significantly showed higher mean rating in terms of acceptability compared to both vacuum- packed fillet and vacuum- packed fillet with bones. Three smart- packaging prototypes were developed. Prototype 2 showed fastest heating

of frozen smoked fish at 5 minutes. From this study, improvements are still recommended for the developed smart- packaging prototypes.

Keywords: *Clarias gariepinus*, Diversified Products, Smart Packaging, Smoked catfish, TinaHITO

10:20-10:40

217– Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables

Joseph O. Castillo, Queennie L. Rufino, Elaine Genevive B. Parcon and Naomi G. Tangonan

ABSTRACT. M This study aims to provide essential data that will support sustainable organic vegetable production. This work would also facilitate the sharing of new results on efficient organic management strategies against insect pests and diseases associated with three solanaceous vegetables without compromising soil fertility and plant health in producing pesticide-free harvests. In an assessment carried out on eggplant, sweet pepper, and tomato field trials, different levels of disease infection and pest infestation were noted. In three months application of different fermented tea (FT) formulations with frequency of seven days, significant responses were observed on treated plants. On eggplant, *Cercospora* leaf spot disease was observed comparable (13.33-15.55 %) with synthetic check at 9.62 % severity. *Phomopsis* fruit rot disease was also noted to have similar results ranging from 8.88-13.33% comparable with the synthetic check with 4.44 % disease severity. In terms of insect pests, significant damages of *Epilachna* larvae (12.22- 35.55 %) and shoot borer (17.78- 24.44 %) were observed. Treatments showed comparable effects on the degree of damages of some FT formulations as compared to the synthetic-treated ones. FT formulations such as on FT1 (1.08 kg/plant) and FT3 (1.09 kg/ plant) also showed comparable effects on yield with commercially available synthetic fertilizer (1.05 – 1.71kg/plant). In case of sweet pepper, disease severity of *Sclerotium* wilt was comparable among treatment means but was least observed on FT-treatment 3 with 5.5 %. Anthracnose disease showed different reactions towards treatment means that ranged from 12 % - 33.00 % where chemical check had the least infection followed by FT treatment 3 with 15.55 % severity. Number of fruit borer infested at harvest was comparable among treatment means which ranged from 1.53 -1.67 fruits/ plant where synthetic fungicide has common mean with FT treatment 3 of 1.53 fruits/plant. Weight (kg) of harvest was comparable among treatment means which ranged from 0.750 – 0.980 kg/ plant where untreated control obtained the least fruits. The same assessment was done on tomato plants where early blight and bacterial wilt were the most damaging diseases observed during the time. Early blight disease was less (5.92) observed on synthetic fungicide-treated plants and highest on untreated ones (24.44 %). Bacterial wilt infection was high which ranged from 13.33 % obtained from FT treatment 3 to 43.33 % severity from untreated control. Tomato fruit borer was noted as the most visible and destructive at harvest. The most number of damages was obtained from untreated control with average mean of 3.20 fruits/ plant and the least were obtained from FT treatment 1 and synthetic fungicide with common mean of 1.20 fruits/plant. Harvest (kg/plant) also showed significant difference among treatment means where the heaviest was obtained from synthetic fertilizer-treated plants with 0.960 kg/ plant comparable with the FT treatments 1 and 2 with 0.718 kg and 0.730 kg/ plant, respectively. The above results will be validated by several analyses such as soil and tissue analysis (pH, organic matter, nitrogen, phosphorous, potassium) and mineral analysis for fermented teas (Micro: Cu, Mn, Fe, Zn and Macro: Na, Ca, K, Mg, N components, and Phytotoxicity) which are still underway.

10:40-11:00

218 – National Cooperative Test of Rice at USM

Nenita E. Olero and Joanne E. Duran

ABSTRACT. USM is one of the collaborators of the National Cooperative Test for rice aimed to help identify the best and most adapted promising line for hybrid and inbred, determine the distinctness, uniformity, and stability of advanced promising lines, and recommend elite rice lines to the National Seed Industry Council (NSIC) for varietal release. The result of the 2021 wet season trial in hybrid, Entry No. 10 with an average yield of 7,302.94 kg/ha out yielded the two check varieties (Mestiso 6 and Mestiso 103) with a yield advantage of 9.47% and 15.41%. For Group II, Entry No. 19 obtained a yield of 6,296.64 kg/ha which was significantly lower than Mestiso 99 with an average of 7,086.00 kg/ha. The result for the 2022 dry season trial revealed that none of the hybrids tested were comparable to the check varieties both for Group I and Group II. For the inbred trial results in 2021 wet season transplanted rice, an average yield of entries ranged from 3032.14 kg/ha to 6768.90 kg/ha. The top two highest yielders were Entry No. 1 and Entry No. 3 out yielded the local check variety (PSB Rc 18) with 18.01% and 4.46% yield advantage, respectively. In the direct seeded trial, Entry No. 1 obtained the highest yield of 5165.83 kg/ha which was significantly better than NSIC Rc 298. In the 2022 dry season trial for transplanted rice, none of the inbred tested were comparable to the check varieties. The yield ranged from 2399.20 kg/ha to 3600.59 kg/ha was significantly lower than the check varieties. In the direct seeded trial, among the five inbred tested, Entry No. 4 got the highest yield of 4796.70 followed by Entry No. 8 (4547.14 kg/ha) which was significantly better than NSIC Rc 402 with an average yield of 4291.77 kg/ha.

Keywords: distinctness, elite rice lines, inbred, hybrid, uniformity

11:00-11:20

219 – Optimization of Irrigation Flow Through Conduit Microhydropower to Generate Electricity for Off-grid Barangay of Kabacan, Cotabato

Marilyn S. Painagan-Calub, Tito Jun T. Tidula, Benhamin I. Mamalo, and Jonnah Mae A. Casalan

ABSTRACT. The University of Southern Mindanao and the Barangay Pisan of the Municipality of Kabacan have been working together since 2015 to promote human and institutional empowerment and development. This project intends to establish a locally fabricated low-cost micro hydropower system that will generate a 15-20 kW of electricity, which is potential enough to electrify the community at Sitio Silangan, Barangay Pisan. For the design of the system, a prototype will be developed, tested and evaluated before optimization. The process of optimization should be done in several iterations. The design of the micro hydropower system is based on the characteristics of the flowing water, the amount of kinetic energy of the flowing water as well as the head and discharge rate of the water source. The project has been started last October 01, 2022, and currently the Project Procurement Management Plan, Project Line-Item Budget, and Purchase Request has been prepared and

submitted for approval. The Project leader and staffs have already conducted the Focus Group Discussion (FGD) to discuss the directions of the project.

Keywords**:** discharge, efficient, prototype, turbine, water-flow

8:40-9:00

314 – Establishment and Conservation of Indigenous Tropical Fruit Crops in the University of Southern Mindanao

Nenita E. Olero, Jessie G. Elarde, Rezin G. Cabantug & Nancy E. Duque

ABSTRACT. Indigenous fruits nowadays can be found in limited areas, rural backyards are getting extinct due to their low popularity and having not so desired taste as compared to their local and imported fruit counterparts. The expansion of large industrial crops which have higher economic value lead to the cutting of some indigenous fruit crops. Considering its medicinal and nutritional value, the need to establish genetic conservation of germplasm is imperative for future scientific research. The objectives of this project are to collect and preserved indigenous tropical fruit crops either of seed origin, variety/clone for identification, morphological characterization; to establish and maintain gene bank for these crops at USMARD Center; and establish nursery and develop propagation techniques. The project has able to collect 24 indigenous tropical fruit crops namely: Verba, Batuan, Katmon, Dao, Libas, Bignay, Purple guava, Star apple, Durain Cacao, Marang, Jackfruit, Guyabano, Atis, Makopa, Atemoya, Sugar apple, Black sapote, Duhat, Sampalok, Star fruit, Kamias, and Inyam from the nursery of the Department of Environment and Natural Resources (4), Department of Agriculture (8), Tupi Seed Farm (4) and six (6) from the backyard of various farmers. There are 489 indigenous plants identified and tagged from among the 28 types of indigenous fruits crops in the province. Cotton candy berries (Aratilis) were the most common with 22.52%, marang 9.90%, Makopa 7.43%, jackfruit and star apple of 6.68%. Results on the clonal propagation of indigenous tropical fruits through cuttings showed no survival for Batuan two months after treatment of plant growth regulators. Bignai on the other hand showed promising results.

Keywords: indigenous, extinct, conservation, genebank, germplasm

9:00-9:20

315- Establishment of Mango and Banana Germplasm for Conservation, Characterization, and Utilization

Sheena B. Lucena and Edward A. Barlaan

ABSTRACT. Mango and banana are important Philippine economic crops due to the demand in local and international market. There is a need to establish a germplasm collection of mango and banana in USM to provide genetic resources needed for varietal improvement and preservation or conservation from genetic erosion or extinction. This study aimed to establish germplasm for mango and banana for conservation and characterization of different cultivars/accession for future utilization. A total of 44 mango accessions were collected and planted in the field of USM Agricultural. Research and Development (USMARD) Center. These accessions were collected from Guimaras and different areas in North Cotabato and Davao region. Further, 25 were classified as non-carabao and 19 were classified as carabao varieties. Information on their different characteristics was also recorded. Some cultivars had already reached the flowering stage. For bananas, a total of 54 cultivars/accessions were

collected from BPI-Davao City and different municipalities in North Cotabato and were planted in USMARD Center. These comprised accessions from the Philippines, Malaysia, Indonesia Thailand, Taiwan, and ITC-Belgium, which were classified into short, medium and tall categories. Data on flowering characteristics, fruit qualities, and other horticultural characteristics were documented.

Keywords: banana, cultivars, germplasm, mango

9:20-9:40

316 - University of Southern Mindanao Futures Thinking for Food Security, Systems, Innovations and Sustainability

Francisco Gil N. Garcia, Edward A. Barlaan and Ma. Teodora N. Cabasan

ABSTRACT. Futures thinking is a future-oriented mindset through a systematic method of exploring alternative futures. It enables people to be future-ready for possible scenarios and improves the quality of decisions to be more strategic and far-sighted. There is a need to capacitate the manpower in various entities in the Philippines to practice Futures Thinking ideas in different fields. In support to government initiative on Futures Thinking, Region 12 State Universities and Colleges (SUCs) Futures Consortium was established, which is spearheaded by University of Southern Mindanao (USM). The capacity building workshop on High Level Anticipatory Leadership and Governance Executive was conducted for SUC leaders and administrators in partnership with the Senate Committee on Sustainable Development Goals (SDG). The consortium constitutes five SUCs, which include Sultan Kudarat State University, Cotabato Foundation College of Science and Technology, Cotabato State University, South Cotabato State College, and USM. The consortium agreed to focus on Halal Futures in Region 12 considering niches of individual SUC for Halal R&D particularly on Halal goat, feed production, fishes, poultry, ruminants, and organic fertilizer. For USM Futures, previously approved research, development and extension (RDE) projects were implemented and monitored. In addition, the Futures Thinking team generated new Futures Thinking-related RDE proposals for evaluation and implementation. These are aligned to food futures for food security, innovations and sustainability dealing with cereals, protein source, high value crops and halal. Further, a workshop for the College of Medicine and health practitioners will be conducted to align the curriculum and goals to the Universal Health Care and SDGs of the Philippines.

Keywords: Futures thinking, innovations, food security, sustainable development goals
9:40-10:00

317 - Organizational Interventions on Halal Certification Systems towards Product Internalization

Abubakar A. Murray, Frederick John B. Navarro, Nerissa G. Dela Viña, Deinmark L. Antes, Leila S. Moscoso, Ray-Hannah Makakena

ABSTRACT. This paper presents of the organizational performances of stakeholders in implementing RA 10817 towards halal certification and internationalization. It aims to determine the gaps among stakeholders on the Halal Certification System towards food product exportation. Interviews and surveys were conducted among the stakeholders such as the local

government units (LGU), regional government agencies, Halal certifiers, food manufacturers, and consumers in Cotabato province. Data were consolidated from the collected primary and secondary data to determine the practices, gaps, and plans. Three populous municipalities/ cities in Cotabato province: Kidapawan, Pikit, and Midsayap. RA10817 identified the roes and functions of each halal certification agencies and stakeholders. In 5-years of Halal law implementation, new offices in LGU have been established to support business promotion and tourism. However, the identified scope and function were not explicit to Halal food promotion. Some of the local agencies have strengthen Halal law sponsoring bills for Halal food systems. Most of the government agencies were active in education, training, and promotion of Halal among SMEs. Large scale food manufacturers have secured international Halal certification, while least number of SMEs were aiming for Halal certification. The response of consumers eating habit for Halal food were identified to understand more drivers of change to Halal certification system. The results of the normal group technique (NGT) from the four stakeholders obtained top priority issues. Common challenges were documented in this project which includes a low-to-no response from stakeholders, difficulty with transportation, and health, election, and security related restrictions.

Keywords: Food products, Halal stakeholders, Halal policy, Cotabato province, Gap analysis

10:20-10:40

318 - Development of e-LET Intervention program for Professional Education

Dyane Rhea B. Bana-ay, Ellen Joy M. Farala, Jean M. Millare

ABSTRACT. Based on a five-year performance of schools data (2015-2019) by PRC, USM-Elementary consistently performed lower (17.02%) than the national passing rate (27.90%). In addition, USM-Secondary performed lower (33.78%) in September 2019 compared to the national passing (39.68%). In order to improve the board exam preparation of its graduates, an e-LET system for professional education courses was developed. Performance of CED graduates categorized based on thinking levels was determined through a series of pre-board exams in Professional Education courses. Results showed that on average, the graduates scored the lowest in Apply (33%), Evaluate (47%), Understand-Categorizing (49%), and Analyze-Differentiating (49%) test items. In terms of subject areas, the most difficult include Developmental Reading (38%), Assessment of Student Learning (39%), and Curriculum Development (40%). To improve the psychometric properties of the test, items with poor and negative discrimination indices (D) were excluded, resulting in a test (D = 0.39) that is significantly better (p-value 0.00 at $\alpha = 0.05$) than the initial preboards (D = 0.28). Pilot testing of the revised instrument was conducted using the eLET system. Test results revealed that respondents scored highest in items that require application (78.43%) and lowest in items that require analysis (67.65%). In terms of per subject performance, respondents scored highest in Principles of Teaching (75.05%) and lowest in Curriculum Development (64.71%).

Keywords: e-LET, Professional Education, Intervention, LET, Study Strategies

10:40-11:00

319 - Needs Assessment, Gap Analysis and Intervention Mapping: Streaming Nursing Program's Implement

Meriales, Marianne I., Taposok, Jza A., Yongque, Rocelle Jean J., Palalay, April Jxeel L., Dela Cruz, Carlo Jason S., Mamaluba, Emmalyn M.

11:00-11:20

320 - USM Education 4.0: Building Adaptive Higher Education Through Technology in the New Normal

Elsa A. Gonzaga, Ma. Luz D. Calibayan, Hazel Ann S. Soriano, Abubakar A. Murray, Eugene G. Ranjo, Kharlo J. Subrio

ABSTRACT. This project aims to develop online management system, reference guide and learning program in the effective utilization and integration of technology in higher education to be able to adapt to the new normal. From the survey conducted among 108 faculty members, usefulness of technology, and their knowledge in using technological and online platforms gained a very satisfactory means of 3.66 and 3.47, respectively. However, faculty find difficulty in terms of integrating technology in teaching with a mean of 2.28. Among 281 students surveyed, knowledge and skills in technology got the highest mean of 3.50 followed by perceived usefulness of technology with a mean of 3.28. However, integrating technology in learning got the lowest mean of 2.52. These results show that both faculty and students are ill-equipped in terms of integrating technology in teaching and learning. Meanwhile, the data gathered will serve as basis for selecting the participants for the focused group discussion (FGD). It will also be used for developing the appropriate training program for the faculty and students. On the other hand, the online management system was on the initial stage of development. Login page and curriculum details window was already created and tested. Meanwhile, benchmarking on manuals of other higher education institutions in the implementation of flexible learning was sought in preparation for the creation of a reference manual on integrating technology in teaching and learning.

Keywords: best practices, educational technology, new normal, teaching and learning, technology integration

11:20-11:40

321 - Efficiency of Various Physical Exercises, Dietary Intakes and Health Conditions of USM Employees: Basis for Program Intervention & Development of Database Management System

Moreno B. Java, Jr., Helen Grace D. Lopez, Urduja G. Nacar, Ryan Z. Gonzaga, Carlo Jason S. Dela Cruz, Marlene E. Orfrecio

ABSTRACT. Health and well-being in the workplace have become an increasing subject in different media platforms. The main objectives of this study to assess the level of physical activities, dietary intakes, health conditions as intervention tool for common health problems of University of Southern Mindanao employees as bases for program intervention and development of health and fitness database management system. Physical Activities of the respondents will be measured using the long version of International Physical Activity Questionnaire (IPAQ) which comprises of 4 sets of questionnaires. For dietary intakes, the Dietary Intake Assessment Form will be used. Finally, for Health Conditions, the Health Condition Questionnaire which comprises of two parts will be used. The pretest and post-test

approach will also be applied to assess the efficiency of Various Physical Exercises as intervention tools for Common Health Problems. All these data to be gathered will be used to develop health and fitness database management systems for USM employees. Using Simple Random Sampling with stratified proportional allocation, the target number of respondents will be 141 for teaching and 70 for non-teaching.

Keywords**:** Aerobic Dance, Biking, Brisk Walking, Dietary Intake, Exercise, Health Condition, Physical Activities

11:40-12:00

322 - Exploring Indigenous Narratives from the South: The Pe'ngang and the Role of Datu in the Conflict Resolution Among the Obo Manobo

Rowell P. Nitafan

8:40-9:00

413 – "Laro Mo, Sagot Ko": A Sports Management Skill Development Project

Cheeze R. Janito and Moreno B. Java Jr.

ABSTRACT. Considering the impact and importance that it brings to the community; the conduct of sports tournament is becoming more regular nowadays especially during fiesta or foundation anniversary in the locality. In line with this, the necessity to capacitate potential residents, Sangguniang Kabataan officials and members to manage local sports tournaments is also becoming more vital to ensure that objectives of the sports program are being achieved. The "Laro Mo, Sagot Ko": A Sports Management Skills Development Project will provide opportunity for the localities to be trained into sports officiating and sports management to lessen the financial burden of running the sports tournament. Further, the focus group discussion among the members of barangay local government unit revealed that there is a need to increase the capacity of the participants on sports management and officiating in volleyball and basketball. This extension project will use both face-to-face approach and development of Information Technology materials to effectively achieved the objectives of capacitating its clients during this time of pandemic. The faculty members of the Institute of Sports Physical Education and Recreation specialized in sports management, basketball officiating and volleyball officiating will be the content creators of the videos to be used as supplemental learning materials among 25 selected members of Sangguniang Kabataan of Barangay Dagupan.

Keywords: Sports Management, Basketball Officiating, Volleyball Officiating, Sangguniang Kabataan, IT Materials

9:00-9:20

414 – Kabataang Kontra Droga at Terorismo: Sports Development Project Phase 1: Skills Acquisition and Development

Marlene Orfrecio, Gladys Pearl O. Ambrocio, Elpedio A. Arias, Jessa S. Buisan, Marichu A. Calixtro , Priscilla P. Dagoc, Jerum B. Elumbaring , Cheeze R. Janito, Moreno . B. Java Jr., Vinus P. Java, Helen Grace D. Lopez, Marlon A. Mancera, Norge D.Martinez, Marlene E. Orfrecio, Eduard S. Sumera, Ruben L. Tagare, Mark. E. San Pedro, Emmanuelle E. Vios, Bae Kellah Landawe and Jemwell Francisco

ABSTRACT. The campaign on drugs and terrorism since the assumption of Former President Rodrigo R. Duterte in 2016 became hard-hitting. This is because of the findings of the Philippine National Police on how drugs and terrorism proliferated in the country. Hence, Kabataan Kontra Droga at Terorismo on February 1, 2019, through Command Memorandum Circular 20-2019 which intends to organize, train, and mobilize the youth and student sectors as advocacy support groups that will stand against drugs and terrorism was launched and executed. Sport is an instrument that set-asides geographical borders and social differences. It promotes social inclusion and economic development in different geographical, cultural, and political contexts. Thus, the program on Kabataan Kontra Droga at Terorismo Sports Development Project was implemented to support the aggressive campaign of the government to fight against drugs and terrorism. It aimed to equip the youth of Makilala with the competencies significant to sustainable sports programs that will help redirect the youth's

attention to the lure of drugs and terrorism. Inclusive in the project is the skills acquisition and development. The Skills Acquisition and Development was conducted every Friday and Saturday from October 29 to November 14, 2021. Fifty-five (55) participants from 10 barangays completed the program in learning the process of playing basketball and volleyball. The collaborative efforts of Makilala Police Station as implementing agency of the KKDAT program, and the Local Government of Makilala as a funding agency contribute to its success. It is a 3-year project tightened with a Memorandum of Agreement. In 2022 Five (5) of its completers were already conducting training activities in their respective community. 20 of its graduates were also representing their respective barangay in the 1st AMQ Inter-Barangay Basketball and Volleyball tournament and Sitio Katipunan Inter-Purok Basketball League. Moreover, a new activity entitled "In-School Sports Clinic" has been forwarded and approved by the Local Government Unit of Makilala which form part of the KKDAT program and will be implemented in December 2022.

***Keywords*:** Drugs, KKDAT-SDP, Terrorism, Skill Development

9:20-9:40

415 – BIO-NIHAN PARA SA KALIKASAN: Promoting Holistic Biodiversity Conservation Through Community Partnership

Cherie Cano-Mangaoang, Bryan Lloyd P. Bretaña, Cromwel M. Jumao-as, Florence Roy P. Salvaña

ABSTRACT. Biodiversity is a key indicator of a healthy ecosystem; thus, its conservation is vital. Sustainability in conservation is attained through community partnerships and collaboration with different stakeholders. The project was carried out to promote holistic biodiversity conservation through community partnership by providing technical assistance and skills enhancement training to trek guides and porters of Mt. Apo utilizing the Mandangan Trail. Series of activities were conducted prior to the implementation of the project including consultative meetings with the partner agency, profiling of the target parabiologists, needs assessment, and conduct of inception meeting. The skills enhancement training on practical identification of flora and fauna was participated by 15 selected porters and guides. A pre-test and post-test were given to the participants and statistical analysis showed significant differences (p-0.021) between test scores. The IEC materials for the project are yet to be completed as the rapid assessment of flora and fauna along the Mandangan trail is yet to be scheduled. Validation of these EIC materials will also be conducted.

Keywords: biodiversity, conservation, community, Mt. Apo, parabiologist

9:40-10:00

416 – Diffusion and Adoption of "Tilakas" Technology

Leonila V. Papalid and Mae R. Escalera

ABSTRACT. Tilapia is the number one captured fish in inland waters and second most cultured fish in the country. It is a fast-grower, omnivorous, and disease-resistant but also a very prolific fish. They tend to crowd wild aquatic environment as well as in captivity. Thus, most inland fishers caught undersized tilapia that are less marketable and sometimes turned

into a waste resource when left unsold. One way of saving the resource is to process them into a value added product. Tilakas is a term coined for "tilapiang pinikas" in Cebuanos and "tilapiang salpakas" in Ilonggos. The acceptability of tilakas prepared in different flavor enhancers was determined through sensory evaluation. Results showed that sweetened tilakas appeared to be the most acceptable product. IEC materials on tilakas technology were developed and ready for use. Collaboration with Municipal Agriculture Office, the Provincial Fishery Office BFAR 12, barangay council of Cuyapon as well as Fisheries Society was forged then to bring tilakas technology to the recipients. Twenty five recipients were taught on the basics of Good Manufacturing Practices, simple cost and return analysis as well as the process flow of producing tilakas. Personal protective equipment were used by the recipients as they did the splitting, brining, soaking, drying and packaging of tilakas. To ensure product safety, one solar fish dryer was turned over to the recipients as a model facility. The conduct of the seminar-workshop truly helped them in saving undersized tilapia from being wasted by turning it into a more acceptable and saleable product.

Keywords: tilakas, tilakas technology, undersized tilapia

10:20-10:40

417 - Project 6. Capability Building of Rubber Stakeholders and Role of Women and Their Children Natural Rubber Industry in Agusan del Sur and North Cotabato

Mary Rodelyn A. Cariaga and Razel O. Montemor

ABSTRACT. The project is under the program entitled Land Management of Diverse Rubber Based Systems in Southern Philippines (SLaM 2017/040) funded by Australian Center for International Agricultural Research (ACIAR) and Philippine Council for Agriculture and Aquatic Resources Research and Development (PCAARRD) It aims to boost the household incomes for indigenous smallholder farmers in the uplands of southern Philippines particularly in Agusan del Sur through the introduction of profitable rubber intercropping systems, sustainable management regimes and capacity building. Trainings are conducted to the smallhold rubber farmers in Agusan del Sur, namely: (1) 7 Rubber Production, (2) 12 Rubber Tapping; (3) 14 Technical Awareness on Rubber Diseases Identification & Control. To date, surveys are still on going to determine the technologies adopted by the farmers-participants.

Keywords**:** capacity building, men and women farmers, smallhold rubber stakeholders, Agusan del Sur, rubber

10:40-11:00

418 – Juan Food: Enabling Rural Families Through Home and Community Garden in Support for Household Livelihood in Barangay Dagupan

Mary Rodelyn A. Cariaga, Romiel John P. Basan and Metche Anne C. Logronio

ABSTRACT. Vegetable farming is one of the promising economic opportunities to reduce rural poverty and unemployment. It serves as an important source of independent income and can provide sufficient supply of food and nourishment. In response to the community need, JuanFood aims to (1) to capacitate the local partners; (2) to establish home and community gardens; and (3) to facilitate point to point vegetable product marketing. In partnership with

DA-LGU Kabacan, DAR and Eastwest Seed Company, the collaborative project in Brgy. Dagupan had identified twenty (20) community partner-farmers. Vegetable production demonstration site was identified and agreed upon by the project partners. Seed sowing and land preparation activities were done following recommended practices. As part of the catch up plan, series of agro-enterprise trainings will be conducted.

Keywords**:** community garden, livelihood, recommended practices, vegetable farming, vegetable

11:00-11:20

419 – Islamic Knowledge Development and Enhancement of Livelihood Skills among Bangsamoro

Hasim K. Iskak

11:20-11:40

420 – Consultancy for Agricultural Productivity Enhancement (CAPE2) Program

Francisco Gil N. Garcia, Edward A. Barlaan, Mary Joy S. Cañolas, USM Experts

ABSTRACT. The Department of Science and Technology 12 (DOST 12), in partnership with the University of Southern Mindanao (USM) through the Extension Services Office (ESO), is implementing the project titled "Implementation of Upgraded Consultancy Services for MSMEs thru Consultancy for Agricultural Productivity Enhancement (CAPE) Program in Region12". The project provides consultancy teams to undertake technology improvement and enterprise productivity studies in micro, small and medium enterprises (MSMEs) in the agricultural sector under the program Consultancy for Agricultural Productivity Enhancement (CAPE). It aims to institutionalize effective farm management strategies to improve agricultural production, including transferring and commercializing better technologies. On December 29, 2022, the Memorandum of Agreement between the USM and DOST 12 is in effect. The project started in January 2022 with a total of 20 USM experts assisting farm owners who are engaged in: (1) High-Value Crops Production, (2) Orchid Farm production, (3) Livestock production, and (4) Poultry production. The experts' technical assistance to forty farms from North Cotabato, Sultan Kudarat, South Cotabato, General Santos City, and Sarangani Provinces through farm & home visits, telephone calls, training, & method demonstration is already in the intervention stage.

Keywords**:** Productivity enhancement, consultancy services, agricultural production

11:40-12:00

421 – Integrated Services for Enhanced Education (I-SEE): A Connectivity Resilience Project Amidst Covid-19 Pandemic

Janice M. Bangoy, Genghis Khan P. Manero, Ardniel A. Baladjay, Alan G. Dalo, Jovelyn S. Gesulga, Myrna R. Tan, Jasmin A. Pecho and Mary Joy S. Cañolas

ABSTRACT. Educational institutions must prioritize finding effective methods of providing new learning opportunities according to their environment, student characteristics, teacher training, economic crisis, and technology advancement to make learning more efficient, equitable, and innovative in higher education. The University of Southern Mindanao Extension Services Office is making additional efforts to provide remote learning services via print, radio, video, online, and offline electronic resources to ensure the continuity of learning amidst the Covid-19 pandemic. These include printing and distributing technology production guide modules, broadcasting video lessons through the internet and radio, and are accessible through computer desktops, laptops, or mobile phones. The Project has a monthly regular radio program titled "Ugnayan Natin sa Radyo at TV and the Teknogiya sa Radyo at TV School-on-Air program (SOA). The Ugnayan Natin sa Radyo program supports partner agencies in disseminating relevant information to the communities. The Extension Services Office airs the Ugnayan Natin sa Radyo at TV with partner agencies, while the school-on-air on Cacao Production has three organized beneficiaries (2 associations and one cooperative) from LGUs Antipas, Tulunan, and Aleosan. The project team produced ten cacao production printed IEC materials for the SOA beneficiaries.

***Keywords*:** Cacao Production, School-on-Air, online learning, enhance education, Information, Education & Communication Materials (IEC)

WINNERS

The 42nd Year-end In-house Review was conducted on December 1-2, 2022 at the Commercial Building in the University of Southern Mindanao. During the activity, all ongoing research projects were presented to a distinguished panel of evaluators. Outstanding projects in five categories were also recognized and identified. The winning projects are:

Category 1 (Basic Research – Science)

1st place: Tamie C. Solpot – Screening of Potential Endophytes as Biocontrol Agent Against Major in Emerging Leaf Diseases of Rubber

2nd place: Lorelyn Joy Turnos-Milagrosa – Organic-Based Interventions for Selected Crops and Sheep Nutrition

3rd place: Mark Al-Jamie Muttulani – Germplasm Collection, Propagation and Fertilization of Anthurium (*Anthurium andraenum*) in USMARDC

Category 2 (Applied Research – Science)

1st place: Lydia Pascual – Potential Anti-Cancer leads from plants in Region XII Proj. Screening of Plants

2nd place: Pia Amabelle Flores – USM LIFER Project: USM & Ligawasan Marsh Fish & Meat-Based Enhanced Ready-to-Eat (RTE) Products

3rd place: Adeflor G. Garcia – Project 3. Developing Rapid and Affordable Soil Nutrient Test Fertilizer Formulation for Rubber Cropping System

Category 3 (Development)

1st place: Edward A. Barlaan – Banana Health Diagnostics: Molecular Surveillance of Major Disease Causal Pathogens of Banana in Region 11 and 12

2nd place: Pia Amabelle M. Flores – DOST PCAARRD and USM Agri-aqua Technology Business Incubator (USM-ATBI

3rd place: Pia Amabelle M. Flores – USM IP-TBM Phase II: Patent Mining of Rubber Technologies Thru Intellectual Property and Technology Business Management (IP-TBM) Operations of the University of Southern Mindanao

Category 4 (Social Research)

1st place: April Rose T. Butalid – Integrating Gender and Development (GAD) Concepts Across Mandated Language, Literature, and Social Science Courses

2nd place: Jacinta T. Pueyo – Intersectionalizing K-12 Graduates' Competencies: a Baseline for Tertiary Instruction, and Materials Development

3rd place: Glyn G. Magbanua – Research Into Practice: Practical Applications of English for Specific Purposes (ESP) in the Workplace

Category 5 (Extension)

1st place: Ardniel A. Baladjay – Tablea: Pangkabuhayan para sa Kotabateñong Pamayanan A Community-based Tablea Production for Sustainable Livelihood in Cotabato

2nd place: Maricel G. Dayaday – SWIPE-Solid Waste and Integrating Program for E-Waste Disposal

3rd place: Tamie C. Solpot – CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate COVID-19 Effects

POSTER COMPETITION

Category 1 (Basic Research)

1st place: Tamie C. Solpot, Ma. Teodora N. Cabasan, Bernadith T. Borja, Melesa M. Prado, and Jomarie Abubakar – Screening of Potential Endophytes As Biocontrol Agent Against Major and Emerging Leaf Diseases of Rubber

2nd place: Tamie C. Solpot. Ma. Teodora N. Cabasan, Bernadith T. Borja, Melesa M. Prado, Jomarie V. Abubakar – Encroachment of New Colletotrichum species Infecting Rubber in the Philippines

3rd place: Frederick John B. Navarro, Deinmark L. Antes, Bryan P. Bretana – Development and Validation of a Reversed Phase High Performance Liquid Chromatography-Photodiode Array Detection Method for Simultaneous Identification of Markers in Zingiber Species

Category 2 (Applied Research)

1st place: Edward A. Barlaan – Utilization of DNA Probe Kits for Detection and Monitoring Banana Diseases in Digital PCR or Quantitative Real-Time PCR: A Big Boost to Banana Industry

2nd place: Bryan P. Bretana, Deinmark L. Antes, Frederick John B. Navarro – Improving Production System for Zingiber species in PICRI: Comparison of Traditional and Micropropagation Techniques

3rd place: Frederick John Navarro, Deinmark Antes, Bryan Bretana – Nutrient retention in commercial production of USM

Category 3 (Development)

1st place: Pia Amabelle M. Flores – Intellectual Property and Technology Business Management

2nd place: Pia Amabelle M. FLores – USM Agri-Aqua Technology Business Incubator

Category 4 (Social Research)

1st place: April Rose T. Butalid, Elangbai B. Dimasingkil, & Estella B. Barbosa – Integrating Gender and Development (GAD) Concepts Across Language, Literature, and Social Science Courses

2nd place: Nerissa G. Dela Vina, Deinmark L. Antes, Frederick John B. Navarro, Leila S. Moscoso, Ray-Hannah Makakena, Abubakar A. Murray – Unravelling Generation X and Y Consumption Behavior for Halal Food Products

Category 5 (Extension)

1st place: Maricel G. Dayaday, Fredelino A. Galleto, Jr. Saque.Amilbahar – SWIPED

2nd place: Ardniel A. Baladjay, Gwen Iris D. Empleo, Sheena B. Lucena, and Janice M. Bangoy – Tablea: Pangkabuhayan para sa Kotabateñong, Community- Based Tablea Production for Sustainable Livelihood in Cotabato Pamayanan

3rd place: Tamie C. Solpot, Frederick B. John Navarro, Ivy Mar B. Cabornida, Pamela B. Villanueva, Mary Joy R. Gran, Gary G. Segundo – CacaoFutures: Production of Cacao Quality Planting Materials (QPM) and Tablea as Health Food for Community Dispersal to Alleviate Covid-19 Effects

WORKING COMMITTEE

Year-End In-House Review
2022

Role	Persons Involved	Responsibilities
Overall Coordinator	Lydia C. Pascual	
Executive/Steering Committee		
	Ma.Teodora N. Cabasan Mary Joy S. Canolas Debbie Marie Verzosa Efren E. Magulama Abubakar A. Murray Lydia C. Pascual Josephine R. Migalbin	➢ To plan and supervise the different activities, welcome and receive the guests ➢ To steer the different committees to action and monitor their activities
Program Committee		
Chairperson	Debbie Marie B. Verzosa	➢ To prepare and print the program and schedule of activities ➢ To distribute the program to all coordinators, advisories and student researchers and USM Key Officials before the review schedule, ➢ To prepare and print the certificates for evaluators, presenters and participants.
Co-Chairperson	Reijie Madre	
Member	Jasmin A. Pecho Athena Beulah Pineda Tessie Eucogco Clarrisa Pillado	
Certificates Committee		
Chairperson	Rhea Ann Antonio	➢ To request certificates from HRMDO ➢ To facilitate the printing and distribution of certificates
Co-Chairperson	Merchia Mayormente	
Member:	Marlon Marquez	
Evaluators Search/Invitation Committee		
Chairperson	Mary Joy S. Canolas	➢ To invite participants and evaluators
Co-Chairperson	Bernadith T. Borja	
Member	Diether Barro	
Registration and Ushering Committee		
Chairperson	Leanne Jay S. Manceras	➢ To usher and register the visitors and participants ➢ To submit the master list of guests and presenters/participants to the secretariat ➢ To prepare the list of visitors, evaluators, and moderators for presentation during the opening program, ➢ To print the names of evaluators to be used during the affair in the session hall
Co-Chairperson	Amancio S. Manceras, II	
Members:	Athena Beulah Pineda Kimberly Lanera Clarrisa Pillado Zaibel Rose Tamon	
Secretariat and Proceedings Committee		
Chairperson	Nenita E. Olero	➢ To collect hard and e-copy of all reports
Co-Chairperson	Dyane Rhea Bana-ay	

Member	Karizza Jane Pejaner	➢ To type all summary output and synthesis during the review ➢ To monitor and make sure that all necessary forms are prepared and reproduced on time in sufficient number and distributed accordingly ➢ To consolidate research reports for the proceedings preparation ➢ To come up with ready to publish proceedings after the review ➢ To develop compendium and database programs for the results and proceedings
Rapporteur Committee		
Over-all Chairperson	Janice M. Bangoy – Extension	➢ To assist the members of the panel in the preparation of thesis and reports ➢ To get 3 copies of each report for file purposes preparation of the proceedings ➢ To prepare the summary of activities for presentation during closing program ➢ To assist in the consolidation and integration of output review
Session I- Basic		
Co-Chairperson	Mary Grace S. Balbuena	
Member	Joelle Aguirre	
Computer operator	Reijie E. Madre	
Session II - Applied Co-Chairperson	Helen A. Macailing	
Member	Abegail Sauyen	
Computer operator	Joshua Canlas	
Session III - Development Co-Chairperson	Kharlo J. Subrio	
Member	Melesa M. Prado	
Computer operator	Joemarie Abubakar	
Session IV - Extension	Janice M. Bangoy	
Member		
Computer Operator		
Audio-Visual Equipment Committee		
Chairperson	Eugene G. Ranjo	➢ To provide and set-up all audio-visual equipment needed during the activity ➢ To restore all the equipment after use
Co-Chairperson		
Member	Floreey Mae Pascua Nelson Balneg Arjay Agbunag Clarence Dave G. Galas	
Hall Preparation, Decoration and Restoration Committee		
Chairperson	Marlene E. Orfrecio	➢ To prepare the venues for the opening and closing program during the conduct of the activity ➢ To ensure cleanliness and orderliness of the venues before and during the event, and
Co-Chair Member	Rezin G. Cabantug Emmanuelle E. Vios Jemwell B. Francisco RDE Team	

		➢ To restore the venues after the activity ➢ To prepare poster stands
Paper and Poster Award Committee		
Chairperson Co-Chairperson	Sandra Joy P. Pahm Mary Ann Rama	➢ To facilitate in the preparation of the text certificates of awards ➢ To facilitate awarding of winners of papers and posters contest ➢ Coordinate with the program/certificate committee
Members	Bernadith Borja Neil Pep Dave Sumaya Roy Ricabar Cris Jun Callano Gerwin Alcalde	
Honorarium and Token Committee		
Chairperson	Ma. Teodora N. Cabasan	➢ To facilitate the preparation of payroll and cash advance for the evaluators' honorarium; and ➢ To prepare the tokens for the evaluators.
Co-Chairperson	Mylin C. Prado	
Member	Deborah Psyche D. Miras Racel Moadas Fritzi Jules Lanera	
Food and Accommodation Committee		
Chairperson	Melchie Palapar	➢ To arrange with Hostel regarding the food and snacks to be served during the In-House Review. ➢ To determine the number of persons to be served so that enough food will be provided to the participants. ➢ To prepare and collect meal stub. ➢ To facilitate accommodation preparation of the evaluators
Co-Chairperson	JmJson Bautista	
Member	Hostel	
Documentation Committee		
Chairperson	Roviline R. Pal-iwen	➢ To document various activities ➢ To assist the proceeding committee in the presentation and publication of the proceedings ➢ To write a news article of the said activity
Co-Chair	Elaine Genevive B. Parcon	
Member		
Transportation and Electricity Committee		
Chairperson	Joel V. Misanes	➢ To provide vehicle to ferry and fetch invited guests ➢ To check all electrical connections before the start of the activity and entire duration of the activities ➢ To provide and facilitate standby generator in case of power interruption/failure
Co-Chairperson	Benjamin E. Fortinez	
Member	Manuel Tayong Oscar Sebastian CTI Faculty	
		MODERATORS
Session I (Basic)	Renee Jane A. Ele	➢ To facilitate the flow of reporting; and ➢ To introduce the reporters and ensure that time is strictly observed
	Joeseph S. Quisado Marlyn Resurreccion Lorelyn Joy N. Turnos	

Session II (Development)	Rowell Nitafan Phoebe Baure Karizza Jane Pejaner Warren Adamat	
Session III (Applied)	Courtney Donque Kathleen Bolotaolo Khristine Joy Garcia Gideon Sumayo	
Session IV (Extension)	JP E. Fortinez Rene Cabahug Esperanza D. Lucena Floreey Tamon	➢
EMCEE Opening Program	Ashley Coleen Ortiz	➢ In charge of the Opening Program
EMCEE Closing Program	Marlyn Resurreccion	➢ In charge of the Closing Program

CLOSING PROGRAM

Commercial Building
December 2, 2022
1:30 PM

SYNTHESIS PRESENTATION

SESSION 1	**MS. MARRY GRACE S. BALBUENA** EPS I
SESSION 2	**ENGR. KHARLO J. SUBRIO** EPS II
SESSION 3	**PROF. HELEN A. MACAILING** CRC, CBDEM
SESSION 4	**MS. JANICE M. BANGOY** TS II
PRESENTATION OF OUTPUT FOR USMARD CENTER RESEARCH	**DR. EFREN E. MAGULAMA** Director, USMARD Center
PRESENTATION OF OUTPUT FOR EXTENSION	**DR. MARY JOY S. CAÑOLAS** Director, Extension Services
PRESENTATION OF OUTPUT FOR COLLEGE-BASED RESEARCH	**DR. LYDIA C. PASCUAL** Director, Research and Development
PRESENTATION OF OUTPUT FOR PICRI RESEARCH	**DR. ABUBAKAR A. MURRAY** Director, PICRI
PRESENTATION OF RDE OUTPUTS	**DR. MA. TEODORA N. CABASAN** Vice President, RDE
ACCEPTANCE OF RDE OUTPUTS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
AWARDING OF BEST PAPERS AND POSTERS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. MA. TEODORA N. CABASAN** Vice President, RDE
CLOSING MESSAGE	**DR. FRANCISCO GIL N. GARCIA** SUC President IV

Singing of USM Hymn

EMCEE: Marlyn Resurreccion

VISION

USM envisions upholding its status of excellence in Research and development by continuing to be the pioneer source of technology and information that are on track towards poverty reduction, food security, and global competitiveness for cohesive and sustainable development among its multi-socio-cultural clienteles.

MISSION

To put into operation a system to undertake multi-disciplinary approach for R & D activities to ensure that technologies and information generated can address the prevailing concerns and issues in the local, regional and national levels for sustainable development.

GOALS

- Improve the system with scientific excellence through collaborative and interdisciplinary R&D activities that are anchored on the University's vision/mission;
- Conduct researches and generate technologies that could provide solutions and address the local, regional, and national concerns and issues;
- Provide a mechanism to ensure that research results be effectively and efficiently delivered to the clients for utilization and commercialization; and
- Build up resource generation facilities for continuous and sustainable R&D programs that are geared towards ensuring food security, global competitiveness, socio-cultural responsiveness that eventually improve the quality of life of the clienteles.