This serves as an invitation

Registration form:
https://forms.gle/dzQR84F2ZoE7nEZW6

Zoom link:
https://zoom.us/meeting/register/tJUqdOqvqTIpG9AWyDkSFwRDxkFAojDpkFna

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

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

2. 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;

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

4. To identify mature technologies ready for packaging and dissemination;

5. To identify significant results for policy formulation and development;

6. To identify new researchable areas; and

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

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OFFICE OF THE PRESIDENT

Message

My warmest greetings to everyone participating in our 41st Agency Research, Development and Extension In-house Review. We are gathered again to assess and evaluate the outputs of our RDE projects. This activity is vital in keeping us on track towards the accomplishments of the set goals and objectives.

As we pursue further development and embrace various technological advances in the fields of research, development and extension, may we stand firm with our passion to help and contribute greatly to these concerns. May we continuously seek and work on helping improve the lives of the people we serve through our RDE endeavors.

God bless our every effort made and will be making as we head-on to a productive two-day In-house Review.

FRANCISCO GIL N. GARCIA, PhD
SUC President IV

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OFFICE OF THE VICE PRESIDENT FOR RESEARCH, DEVELOPMENT AND EXTENSION

Message

The theme of 41st Agency RDE In-House Review, "Innovation 4.0: USM RDE Creating Smart Futures" reminds, encourages and pushes us to higher levels, efforts and standards in research, development and extension (RDE) in the university. We look to the future and as we continue raising the bar through innovative advances in RDE in USM, we can be one of the premiere RDE universities not only in the country but also in the ASEAN region or ultimately in the world. We look forward to creating innovations and breakthroughs to become more competitive nationally and internationally. Yes, USM we can do it!

We appreciate the efforts of all faculty and researchers who did their best despite the challenges and limitations caused by the COVID-19 crisis. Wishing all the presenters of ongoing and completed programs and projects the very best of the best.

We congratulate and thank the organizers- USMARD Center with RDO, RPSO, ESO and other RDE units, different committee heads and members, distinguished evaluators and the USM administration for a successful 41st Agency RDE In-House Review.

EDWARD A. BARLAAN, Ph.D.
VP for Research, Development and Extension

GENERAL SCHEDULE OF ACTIVITIES

DAY 1: November 4, 2021 (Thursday)

TI ME	ACTIVITY
8:30 AM – 9:00 AM	Registration and Entering Zoom
9:00 AM – 9:45 AM	Opening Program
9:45 AM – 10:00 AM	Going into Breakout Rooms
10:00 AM – 11:20 AM	Presentations
11:20 AM – 12:00 NN	Poster Viewing
12:00 NN – 1:00 PM	*Break*
1:00 PM – 4:00 PM	Presentations

DAY 2: November 5, 2021 (Friday)

TIME	ACTIVITY
8:20 AM – 12:00 AM	Presentations
12:00 PM- 1:00 PM	*Break*
1:00 PM – 2:40 PM	Presentations
2:40 PM – 3:00 PM	*Break*
3:00 PM – 3:30 PM	*Tabulation of Scores*
3:30 PM - 5:00 PM	Awarding and Closing Program

Opening Program

Via Zoom
November 4, 2021
8:30 AM

Invocation	**In-Video**
National Anthem	**In-Video**
Welcome Remarks	**Dr. Edward A. Barlaan** Vice President for RD&E
Message of the President	**Dr. Francisco Gil N. Garcia** SUC President IV
Rationale	**Dr. Efren E. Magulama** Director, USMARD Center Over-all Coordinator, In-House Review
Presentation of Evaluators	**Dr. Ma. Teodora N. Cabasan** Director, Research and Development Office

EMCEE : Julius Jerome G. Ele

EVALUATORS

Session I

Basic Research: Natural Science, Engineering & ICT

Dr. Emmanuel Leaño

Dr. Lynn Esther Rallos

Dr. Lorna Vilbar

Session II

Applied Research: Natural Science, Engineering & ICT

Dr. Mylene Anwar

Dr. Violeta Bello

Dr. Laiza L. Limpin

Session III

Extension and Development

Dr. Siony S. Brunio

Dr. Filma C. Calalo

Prof. Gloria dela Peňa

Session IV

Basic and Applied Research: Education and Social Science

Dr. Ruth Ortega-Dela Cruz

Dr. Mervin Gascon

Dr. Rosalina Palanca-Tan

MODERATORS

Session I

Basic Research: Natural Science, Engineering & ICT

Day 1 (November 4, 2021)
AM- Marlyn A. Resurreccion
PM- Frans Bert Gomez

Day 2 (November 5, 2021)
AM- Rowell Nitafan
PM-Courtney Dunque

Session II

Applied Research: Natural Science, Engineering & ICT

Day 1 (November 4, 2021)
AM- Maria Luz D. Calibayan
PM- Gerlie E. Ticbe

Day 2 (November 5, 2021)
AM- Joseph Castillo
PM- Leanne Jay Manceras

Session III

Extension and Development

Day 1 (November 4, 2021)
AM- Rowell Nitafan
PM- Courtney Dunque

Day 2 (November 5, 2021)
AM- Aljory John Boje
PM- Frans Bert Gomez

Session IV

Basic and Applied Research: Education and Social Science

Day 2 (November 5, 2021)
AM- Mirasol O. Verona
PM- Richelle Sampiano

Closing Program

Via Zoom
November 5, 2021
3:30 PM

SYNTHESIS PRESENTATION	
SESSION 1	**MS. MARRY GRACE S. BALBUENA** EPS I
SESSION 2	**ENGR. KHARLO J. SUBRIO** EPS II
SESSION 3	**MS. JANICE M. BANGOY** TS II
SESSION 4	**DR. NANCY DUQUE** CA Faculty
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 RESEARCHES	**DR. MA. TEODORA N. CABASAN** Director, Research and Development
PRESENTATION OF OUTPUT FOR PICRI RESEARCHES	**DR. ABUBAKAR A. MURRAY** Director, PICRI
PRESENTATION OF RDE OUTPUTS	**DR. EDWARD A. BARLAAN** Vice President, RDE
ACCEPTANCE OF RDE OUTPUTS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
AWARDING OF BEST PAPERS AND BEST POSTERS	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. EDWARD A. BARLAAN** Vice President, RDE
RECOGNITION FOR PUBLICATION	**DR. FRANCISCO GIL N. GARCIA** SUC President IV **DR. DEBBIE MARIE B. VERZOSA** Director, Publication Services
CLOSING MESSAGE	**DR. FRANCISCO GIL N. GARCIA** SUC President IV
CLOSING PRAYER	**ENGR. KHARLO J. SUBRIO** EPS II

EMCEE: Glyn G. Magbanua

Day 1 Presentations
(November 4, 2021)

Starts	Ends	Session 1 - Basic Research: Natural Science, Engineering, and ICT	Session 2 - Applied Research: Natural Science, Engineering, and ICT	Session 3 - Extension and Development	Session 4 - Basic and Applied Research: Education and Social Science
10:00	10:20	S102 - SMART Project Study # 3: Development of Weather-based forecasting as Early Warning System for Integrated Pest Management of High Value Crops (Purificacion O. Cahatian)	S201 - Enhancing RD&E Indexing System (RDEIS) of USM: Design, Development and Evaluation (Melecio A. Cordero, Jr., Eugene G. Ranjo, Ryan Z. Gonzaga)	S302 - USM CA Extension Services: AgriKonek Gamit ang SocMed (Josephine R. Migalbin, Julius Jerome Ele, Tamie C. Solpot)	
10:20	10:40	S109 - Comparative Analysis of the Biochar Derived from Rice Straw, Rice Husk, Corn Stalks, Corn Cobs, and Oil Palm Empty Fruit Bunch on Soil Water Retenion Capacity and Development and Growth of Pechay (Brassica rapa subsp. Chinensis) (Tito Jun T. Tidula and Rezin Cabantug)	S202 - Digitalization of USM Faculty Workload (Hazel Ann S. Soriano, Ryan Z. Gonzaga, and Arjay S. Agbunag)	S304 - Integrated Video And Audio Learning Services For Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2020) (Janice M. Bangoy, Ardniel A. Baladjay, Genghis Khan P. Manero, Alan G. Dalo, Jovelyn S. Gesulga and Myrna R. Tan)	
10:40	11:00	S125 - Screening of Plants from Region XII with Potential Anti-cancer Activity (Loveille Jun A. Gonzaga, Harem R. Roca, Francisco Gil N. Garcia, Lydia C. Pascual)	S204 - Design and Development of Online USMCEE Registration System (Arjay S. Agbunag, Clarence Dave C. Galas, Alvin C. Mibalo)	S310 - Sustainable Human Development and Resiliency (SHuDaR) Framework for the COVID-19 Pandemic-Affected Communities in North Cotabato Province (Ma. Dely P. Esberto, Joel V. Misanes, Samson C. Rapuza, Manuel J. Tayong)	
11:00	11:20	S122 - Screening of Potential Endophytes as Biocontrol Agent Against Major and Emerging Leaf Diseases of Rubber (Tamie C. Solpot, Bernadith T. Borja, Ma. Teodora N. Cabasan, Melesa M. Prado, and Jomarie Abubakar)	S234 - Molecular Detection and Identification of Microbial Pathogens of Banana (Edward A. Barlaan, Michael James L. Abrea, and Evelyn F. Alejandro)	S312 - Curriculum Development and Offering on Halal Science and Scholarship for SUC Faculty on Halal Science (Josephine R. Migalbin, Ruby Hechanova, Luzviminda T. Simborio, Jurhamid C. Imlan)	
11:20	12:00	POSTER VIEWING	POSTER VIEWING	POSTER VIEWING	POSTER VIEWING
12:00	1:00	LUNCH BREAK	LUNCH BREAK	LUNCH BREAK	

** Projects highlighted in green are competing.

Day 1 Presentations
(November 4, 2021)

Starts	Ends	Session 1 - Basic Research: Natural Science, Engineering, and ICT	Session 2 - Applied Research: Natural Science, Engineering, and ICT	Session 3 - Extension and Development	Session 4 - Basic and Applied Research: Education and Social Science
1:00	1:20	S124 - Evaluation and characterization of ten promising varieties of cacao in Type II and III agro-climatic zones in Northern and Southern Mindanao (Cris Harvin Rey G. Calvo, Gwen Iris D. Empleo, Romulo L. Cena, Sheena B. Lucena and Jayson S. Baltazar)	S210 - Commercialization of Chayote Products (Jenny B. Mamacus, Emilie S. Estelloso, Janice E. Reynes, Jo-Ann D. Santos, April Geraldine M. Quiñonero)	S313 - Project 2. Market Analysis and Positioning of Processed Halal Chevon Food Products (Jalaloden Marohom, Ivy Mar Cabornida and Crystal Jhane A. Garate)	
1:20	1:40	S110 - Diversifying the Utilization of Corn as Food and Silage for Food Security (Efren E. Magulama, Nenita E. Olero, Jurhamid C. Imlan, Ivy Mar B. Cabornida, Jessie G. Elarde and Joanne E. Duran)	S211 - Standardization Protocol for the Development of USM Food Products (Harem R. Roca, Frederick John B. Navarro, Bryan Lloyd P. Bretaña and Marlon L. Manansala)	S315 - Development And Utilization Of Learning Materials For Community Animal Health Workers (Elizabeth C. Molina, Lilian A. Lumbao and AP Warren P. Adamat)	
1:40	2:00	S127 - 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 Rheo Ryan P. Balbuena)	S212 - Evaluation Of Microbial, Physical, And Chemical Properties Of USM High-Value rops Processing Center Food Products For Quality Control Measures (Bryan Lloyd P. Bretaña, Frederick John B. Navarro, and Harem Roca)	S321 - Tablea: Pangkabuhayan Para sa Kotabateňong Pamayanan: Community-Based Tablea Production for Sustainable Livelihood in Cotabato (Ardniel A. Baladjay, Janice M. Bangoy, Gwen Iris D. Empleo, and Sheena B. Lucena)	
2:00	2:20	S131 - Pilot testing and validation of SSR marker kit for Philippine mango germplasm in commercial mango nurseries (Emma K. Sales, Marry Grace S. Balbuena, Jane R. Desamito, and Avigel I. Cabrillos)	S213 - Optimization of Natural Flavored Vinegar and Commercialization of USM Products from High Value Crops (Frederick John B. Navarro, Bryan Lloyd P. Bretana, and Harem R. Roca)	S323 - USM-CA Ugnayan sa mga Magsasakang Moro at Katutubo (Josephine R. Migalbin, Tamie C. Solpot, Baser L. Mamalac, Geoffray R. Atok, Ardniel A. Baladjay, Jurhamid C. Imlan, Samsudin S. Panday, Jaloloden B. Marohom)	

** Projects highlighted in green are competing.

Day 1 Presentations
(November 4, 2021)

Starts	Ends	Session 1 - Basic Research: Natural Science, Engineering, and ICT	Session 2 - Applied Research: Natural Science, Engineering, and ICT	Session 3 - Extension and Development	Session 4 - Basic and Applied Research: Education and Social Science
2:20	2:40	S133 - Phenotypic and Genotypic Analysis of Coffea canephora (Robusta) using Morphological and molecular markers (Emma K. Sales, Harem R. Roca, Jeannie R. Binaohan, Rheo Ryan P. Balbuena and Jomarie V. Abubakar)	S214 - Market potential and product acceptability of UF18 cacao variety (Cheryl Y. Dulay, Ivy Mar B. Cabornida, Jigzcel Divine F. Basoy)	S325 - CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful Action) Amidst Covid-19 (Sedra A. Murray, Meriam Rubio, Marivic Candari, Bejian Arellano, Roel Valenton)	
2:40	3:00	S112 - Development of Cost Effective Pests Management for Rubber and Intercrops (Purificacion O. Cahatian)	S205 - Development of Low Cost Tilling Machine for Optimum Vegetable gardening (Joel V. Misanes & Ma. Dely P. Esberto)	S326 -"UBING NGA NAALIBTAK": Fostering Social Resilience Among Grade School Learners Through Moral And Law-based Education (Ivy S. Millare, Roselyn M. Clemen. and Maricar U. Juaneza)	
3:00	3:20	S113 - Disease profile in rubber-based farming system in Southern Philippines (Purificacion O. Cahatian, Joan P. Sadoral)	S207 - Maguindanaon Food Products and Delicacies: Standardization and Promotion for Commercialization (Roy B. Gacus, Francisco Gil N. Garcia, Esmaira G. Gunsayan, Geraldine M. Quiñonero, Merlyn A. Musali, and Leonora M. Silvano)	S314 -USM Wildlife Rescue and Research Center (USM-WRRC0 as Agri-Tourism Destination) (Florence Roy P. Salvaña)	
3:20	3:40	S114 - Land suitability analysis for rubber and its intercrops of the fourteen municipalities of Agusan del Sur (Adeflor G. Garcia, Nephtalie F. Morgado and Richie P. Lador)	S230 - SMART Project Study #5: Development of Data Hub for Smart Agriculture Technologies (Melecio A. Cordero Jr., Jerry T. Piamonte, and Clark Kneil L. Caoile)	S332 - DOST-PCAARRD and USM Agri-Aqua Technology Business Incubator (Pia Amabelle M. Flores, Jalaloden Marohom, and Benjie Mari)	
3:40	4:00		S233 - Upgrading of Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKSARGEN (Francisco Gil N. Garcia, Adeflor G. Garcia3, Purificacion O. Cahatian, Dennis F. Sarmiento)	S333 - 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 (Pia Amabelle M. Flores, Cyrelle M. Besana and Abegail B. Sauyen)	

** Projects highlighted in green are competing.

Day 2 Presentations
November 5, 2021

Starts	Ends	**Session 1 - Basic Research: Natural Science, Engineering, and ICT**	**Session 2 - Applied Research: Natural Science, Engineering, and ICT**	**Session 3 - Extension and Development**	**Session 4 - Basic and Applied Research: Education and Social Science**
8:20	8:40		S222 - Upgrading of Crop Processing center at University of Southern Mindanao (Francisco Gil N. Garcia and Harem Roca)	S329 - Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS-Plans) (Leorence C. Tandog, Debbie Marie Verzosa, Florie Jane Tamon, Benedict Entera, Shandra C. Gonsang, Astrofil Hyde Alcala)	
8:40	9:00	S101 - SMART Project Study # 1: SMART Irrigation System for Plantation Crops through Hyrdrometeorological Monitoring (Willie Jones B. Saliling and Kristine Anne Ramos-Candidier)	S221 - Development of Handbook on Good Agricultural Practices and Marketing Practices for Economically Important Crops in USM (Edward A. Barlaan, Marry Grace S. Balbuena, Jeannie U. Duka, Victor C. Dapon, Helen A. Macailing and Nicko Abestano)	S303 -Integrated Video And Audio Learning Services For Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2021) (Genghis Khan P. Manero, Janice M. Bangoy, Ardniel A. Baladjay, Allan G. Dalo, Jovelyn S. Gesulga, Myrna R. Tan, Jasmin A.	
9:00	9:20	S103 - SMART Project Study #4: Identification Of The Strengths And Limitations Of The Potential Areas For Some High Value Crops (Cacao, Coffee, Cardava-Banana, Longkong-Lanzones, Rubber And Pummelo) In Southern Mindanao (Region 11 And 12) (Rezin Cabantug, Adeflor G. Garcia, Eden Romero and Benjihar Mantis)	S209 - Upgrading of High Value Crops Food Processing Laboratory at University of Southern Mindanao (Sandra Joy P. Pahm and Harem R. Roca)	S305 - HEALS (Health, Environment, Agriculture and Livelihood Skills) for Sustainable Development (2020) (Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Monaira Sumael, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva, Joel V. Misanes)	S421 - Students' Academic Performance Using Online Synchronous And Asynchronous Teaching Modalities (Saima M. Andil, Jikiri M. Entol, Remedios C. Kulidtod, Abdulnasser G. Makalugi, Norjaida D. Maliga, Sofia G. Molao)

** Projects highlighted in green are competing.

Day 2 Presentations
November 5, 2021

9:20	9:40	S104 - Smarter Approaches To Reinvigorate Agriculture As An Industry-Phase II: SARAI – Enhance Agricultural Monitoring System in North Cotabato (Adeflor G. Garcia PhD., Purificacion O. Cahatian, Romulo L. Cena, Rezin G. Cabantug and Dennis F. Sarmiento)	S223 - Upgrading of Tissue Cultures Facility in University of Southern Mindanao (Mark Al-Jamie J. Muttulani, Harem R. Roca, and Edward A. Barlaan)	S306 - HEEALS (Health, Environment, Education, Agriculture and Livelihood Skills) for Sustainable Development (2021) (Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Tamie C. Solpot, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva, Joel V. Misanes)	S425 - My Parents, My Teachers: Continuing Education Amidst COVID-19 Pandemic (Marcos F. Monderin, Vicente Delos Reyes, Mirasol O. Verona, Khristine Joy Garcia, Rosemarie Sison, Roselyn Clemen)
9:40	10:00	S107 - MECO-TECO Joint research project: Improvement of 'Carabao' mango fruit quality and production through development of molecular markers for scab and stem-end rot resistance by genome wide association studies (GWAS) (Edward A. Barlaan, Joan P. Sadoral, Joellee L. Aguirre, Jeralden O. Vido)	S224 - Upgrading Of Cacao Post-Harvest Processing Center At The University Of Southern Mindanao (Harem R. Roca and Sheena B. Lucena)	S307 - SMART Project #7: SMART Technology Transfer for High Value Crop Stakeholders (Adniel A. Baladjay, Janice M. Bangoy, and Adeflor G. Garcia)	S426 - Educational Innovations in Rural And Remote Communities: A Multi-Dimensional Approach (Leorence C. Tandog, Debbie Marie Verzosa, Bonifacio Solsoloy, Joy Gloria Sabutan, Astrofil Hyde Alcala, Shandra Gonsang, Benedict Entera)
10:00	10:20	S108 - 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 and Emma K. Sales)	S203 - Development and Evaluation of Automated System for Profiling of Student Organizations in the University of Southern Mindanao (Yvonne V. Saliling, Geraldine M. Quiñonero, Paul John B. Ongcoy, Ryan Z. Gonzaga)	S308 - Establishment of Urban Agriculture at University of Southern Mindanao (Joan P. Sadoral, Purification O. Cahatian, Adeflor G. Garcia)	S428 - Matya Tanu (Magbasa Tayo) (Shandra C. Gonsang, R.Sison, ML Calibayan, W.Aquino, N.Du, FM Reyes, N.Pabinal, R.Sugadol & B.Wali)

** Projects highlighted in green are competing.

Day 2 Presentations
November 5, 2021

10:20	10:40	S111 - Selection For Glyphosate Tolerance And Corn Borer Resistance In Corn Segregating Populations (Jessie G. Elarde, Edward A. Barlaan)	S206 - Development of Rapid Technique for Analysis of Adulterated Wholesome Food Products: A combination of Spectroscopy and Chemometrics for Halal Food Analysis (Frederick John B. Navarro and Queennie G. Llera)	S309 - Production Of Tissue-Cultured Banana (Saba/Cardava) Planting Materials (Harem R. Roca, Jane R. Desamito, Carl Jonas D. Gocotano, Analyn V. Matutis, Janine Joyce F. Develleres, Raffy James P. Balancio, Gelan Mae S. Tudlas And Esmael I. Molero, Jr.)	S434 - Coffee Table Book: Dokumentasyon Ng Mga Mahahalagang Bagay At Tagpo Sa Buhay Ni Bai Hadja Fatima Matabay N. Plang -MIT-USM Founder (Shandra C. Gonsang, Meriam M. Rubio and Radji A. Macatabon)
10:40	11:00	S130 - Development of Innovative approaches for clonal propagation of industrial and fruit crops (Sheena B. Lucena, Ferdinand A. Duldulao and Edward A. Barlaan)	S208 - Development, Standardization and Packaging of Nutri-foods for Emergencies (Jigzcel Divine F. Basoy, Ivy Mar B. Cabornida, Maribelle T. Piamonte, Leila S. Moscoso, & Urduja G. Nacar)	S311 - COMMUNITY BASED DEVELOPMENT and ECONOMIC MAINSTREAMING (CBDEM) on promotion of Halal Food Products (Analyn A. Gonzales Jul-Aida U. Enock Metche Anne C. Logronio Jeannie U. Duka Mitzi Aileen M. Alba Charisse Angela S. Quiambao)	S430 - Establishing Baseline Agriculture Performance And Rural Development Indicators From A Governance Perspective (Francisco Gil N. Garcia, Geoffray R. Atok, Jalaloden B. Marohom, Nerissa G. Dela Viña and Jennet R. Mag-aso)
11:00	11:20	S121 - Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables (Purificacion O. Cahatian, Maria Irinea S. Candolita and Naomi G. Tangonan)	S225 - Effective Rubber-based cropping system in Agusan del Sur and North Cotabato (Adeflor G. Garcia and Linda Buquir)	S301 - Implementation of Upgraded Consultancy Services and Technical Assistance for MSMEs through Consultancy for Agricultural Productivity Enhancement (CAPE) Program (Ardniel A. Baladjay, Edward A. Barlaan, Mary Joy S. Cañolas, Janice M. Bangoy)	S431 -Study on the Utilization of Marang Fruit (Artocarpus Odoratissimus Blanco) and Assessment of Fruit Production In Mindanao (Norma U. Gomez and Roy Gacus)
11:20	11:40	S132 - Validation Of Molecular Markers For Identification Of Cacao HYVs, Criollotypes And Disease Resistant Varieties Through Marker-Assisted Breeding (Edward A. Barlaan, Amy E. Elivazo and Allen Jay E. Austria)	S226 - Developing Robust Diagnostic Tools and Effective Chemical Formulation for Rubber and Companion Crops to Improve Rubber Productivity (Adeflor G. Garcia, Johnvie B. Goloran, Mel Chrisel A. Sales, Oscar J. Jurado and Argie P. Casis)	S322 - SOXAARRDEC: Kaagapay ng Magsasaka sa Krisis at Kalamidad (KMKK) (Elizabeth C. Molina, Adrniel A. Baladjay, Siony Brunio, and Analyn Derequito)	S424 - Intermediate Teachers' Competence And Readiness in Teaching Writing in the English Language (Marcos F. Monderin, Reizelle Mae C. Amilbahar, Rhodora A. Melgar, Lawrence Anthony U. Dollente, Jerose L. Molina, Marlyn A. Resurreccion, and Khadiguia O. Balah)

** Projects highlighted in green are competing.

Day 2 Presentations
November 5, 2021

11:40	12:00		S227 - NICER Project #1 - Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Productivity and Profitability (Edward A. Barlaan, Cris Harvin Rey G. Calvo, Alvin John R. Quitel, Elcy Jane C. Naquitquitan, Kristine D. Paguntalan)	S324 - CED Cares (Community Assistance thru Research and Extension Services): Development and Utilization of Flexible Teaching Guides in Science (Ellen Joy M. Farala, Bailyn M. Mantawil, Faith P. Buned)	S422 - Development of On-Line Educational Contextualized and Indigenized Instructional Material Supplementing IP Quality of Education (Amme Rose L. Blonto-Nonol)
12:00	1:00	LUNCH BREAK	LUNCH BREAK	LUNCH BREAK	LUNCH BREAK
1:00	1:20	S126 - USM-Treelife Biotechnology Development Program: Isolation And Molecular Characterization Of Potential Plant Growth Promoting Microorganisms From Coconut Industry Waste (Maria Elena N. Tanabe, Cromwel M. Jumao-as & Jerry John M. Taray)	S228 - NICER Project #2 - Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement (Gwen Iris D. Empleo, Ivy M. Pasquin, Jeannie R. Binaohan, Avigel I. Cabrillos, Engela Maricris Gaoiran, Ryan C. Eder)	S335 - 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)	S423 - Tracer Study Of The University Of Southern Mindanao Criminology Graduates (Richard T. Camara)
1:20	1:40	S128 - Productivity Of Crossbred Sheep And Goats Fed Brachiaria Hybrid cv. Mulato Ii (Brachiaria Ruziziensis X B. Brizantha X B. Decumbens) Fertilized With Varying Levels Of Nitrogen (Josephine R. Migalbin, Roy C. Ricabar, Julius Jerome G. Ele, Geoffray R. Atok, Jurhamid C. Imlan)	S229 - NICER Project #3 - Development Of Optimized Post-Harvest Processing Approaches For Improved Quality Of Cacao Beans (Renel M. Alucilja, Maricel G. Dayaday, Ritchell Joy T. Cuarteros, May Nards Y. Penales, Sheena B. Lucena, Jayson S. Baltazar, Sanshine O. Lacsao, Lydia C. Pascual, Keith Bryan V. Marcelino, Lawrence Dhaniel L. De Jesus)	S327 - Teacher Nanay: Mothers Today, Teachers Tomorrow (Glyn G. Magbanua, Shandra Gonsang, Erwin Mallo, Jerose Molina, Sofia Loren Neyra, Maricar Juaneza, Mariz Balquin, Vicente Delos Reyes)	S427 - Enhancing Ethics, Professional Responsibility And Lifelong Learning Competence Of Engineering Students Through Outcomes-Based Teaching And Learning (OBTL) During Pandemic (Kharlo J. Subrio)

** Projects highlighted in green are competing.

Day 2 Presentations
November 5, 2021

1:40	2:00	S115 - Etiological Studies and Integrated Disease Management of Major Diseases of Dragon Fruit (Jasmin A. Pecho, Ardniel A. Baladjay and Samsudin S. Panday)	S232 - SMART Project Study #2: Smart Soil and Nutrient Management using Sensor Technologies to Increase Productivity of High Value Crops at the University of Southern Mindanao (Adeflor G. Garcia, Sheena B. Lucena, Jessie G. Elarde, Carlo D. Bacus)	S328 - English Language Intensive Training for Excellence (ELITE) (Roel A. Naringahon, Marlyn A. Resureccion, Lloyd Anton Von M. Colita, Ana Marie B. Uyangurin and Edna Luz T. De Guzman)	S433 - Supply Chain Analysis of Pummelo in Selected Regions of the Philippines (Joeteddy B. Bugarin and Kathleen Ivy Z. Bolotaolo)
2:00	2:20	S123 - Collection, Evaluation And Maintenance Of Cut Foliage And Flowering Pot Ornamentals At USMARD Center (Nancy E. Duque and Lorelyn Joy N.Turnos)		S331 - EEnhancement Of Enterprise, Marketing And Financial Practices Among Registered Tricycab Drivers And Owners (TDO) Of Kabacan (Analyn A. Gonzales, Jalaloden B. Marohom, Mitzi Aileen M. Alba, Neressa G. Dela Viña, Cheryl Y. Dulay)	
2:20	2:40			S336 - Capability Building of Rubber Stakeholders and Role of Women and their Children in Natural Rubber Industry in Agusan del Sur (Mary Rodelyn Cariaga and Razel O. Montemor)	
2:40	3:00				

** Projects highlighted in green are competing.

10:00 – 10:20

S102-Development of Weather-Based Forecasting Tool Through Simulation and Modeling as Early Warning System for Integrated Pest Management for High Value Crops

Purificacion O. Cahatian, Marilyn S. Painagan, Joseph S. Quisado and Joan P. Sadoral

ABSTRACT. This study was conducted to develop a forecasting tool that will forewarn the farmers of the possibility of occurrence of the major insect pest and diseases of coffee, cacao, rubber, lanzones, cardava banana and pomelo. The input parameters in the development of the forecasting tool were climatic data and the population of major insect pests and natural enemies and the incidence of diseases of coffee, cacao, rubber, lanzones, cardava banana and pomelo. The observation and collection of coffee leaf rust and berry borer, pomelo sooty mold and rind borer, rubber anthracnose leaf spot, cacao pod rot and pod borer, lanzones leaf blight and mussel scale insect, banana black sigatoka, banana flower thrips and natural enemies as well as the real time climatic data were done at the University of Southern Mindanao, Kabacan, Cotabato. The forecasting tool was developed using the feed- forward neural network. A back propagation method was used in the optimization of the parameter's weight and a gradient descent which is an optimization algorithm was used in finding the value of the coefficients through one thousand times iterations. The forecasting algorithm was calibrated using the actual field data of the input parameters from February 2021 to October 2021. The calibrated forecasting algorithm was tested by simulating the actual field data that were set aside for simulation from the same range of months. Results showed a best fit between the actual and predicted values of citrus rind borer with an average error prediction of 0.32, a good fit for coffee berry borer, cacao berry borer, lanzones leaf blight, banana black sigatoka, rubber corynespora leaf fall, and cacao pod rot, with an average error prediction of 1.25, 2.21, 2.35, 5.51, 5.44, and 7.31 respectively. On the other hand, large error prediction was shown between the actual and predicted values of banana flower thrips with an average error prediction of 22.64. For grouped discrete data outputs, results showed large error prediction for coffee leaf rust with 5 correct predictions out of 14 instances, pomelo sooty mold with 6 correct predictions out of 17 instances, and lanzones mussel scale insect with 4 correct predictions out of 10 instances. 3 For the natural enemies, large values of prediction error were shown between the simulated and predicted population of *Chilocorus circumdatus, Chilocorus nigrita* and *Telsimia nitida* with an average error prediction of 34.8, 16.63 and 243.1, respectively. Based on the forecasting results, it can be concluded that the weather-based forecasting tool for pests and diseases for high value crops that was developed is capable of forecasting the population dynamics of pests, natural enemies and diseases. To fine-tune the forecasting results it is recommended to add more datasets of pests and diseases.

Keywords: Weather-based forecasting; Early warning system; pests; natural enemies; diseases; forecasting algorithm

10:20 – 10:40

S109- Comparative Analysis of the Biochar Derived from Rice Straw, Rice Husk, Corn Stalks, Corn Cobs and Oil Palm Empty Fruit Bunch on Soil Water Retention Capacity and Development and Growth of Pechay (*Brassica rapa* subsp. Chinensis)

Tito Jun T. Tidula and Rezin G. Cabantug

ABSTRACT. Biochar enhances marginal soil productivity, reduces fertilizer use and sequesters carbon and thereby minimize climate change. There is a challenge in producing biochar due to availability of equipment, which portable and easy to operate. This project aimed to develop retort for biochar production of agricultural wastes such as rice hull, rice straw, rice husks, corn stalks, corn cobs and oil palm empty fruit bunch (EFB). The physical and chemical characteristics of biochar such as bulk and particle density, porosity, pH, ash content, nitrogen and phosphorous were determined. Further, the effect of biochar on soil water retention capacity and growth of pechay were established. The project successfully fabricated a retort that able to produce biochar from rice straw, rice husks, corn stalks, corn cobs and oil palm EFB. Trial recorded a maximum temperature of 538°C with no deformation occurred. Biochar produced from rice hull showed the highest bulk and particle density with 311.12 and 518.93 kg/m3, respectively. Biochar from corn stalk has the highest porosity of 68.90%. Chemical analysis revealed a significant result on biochar produced from rice straw biochar having a highest pH and nitrogen content of 10.01 and 1.27%, respectively. Biochar from rice hull has the highest ash content (43.98%) while the empty fruit bunch biochar showed the highest phosphorous content (0.27%). Pot experiment revealed that increasing the amount of biochar into soil increased the soil water retention capacity except for biochar produced from oil palm EFB. However, increasing the amount of biochar from EFB into soil increases the soil moisture loss. Determination of the effect of biochar on the growth of pechay is on-going.

Keywords: agricultural waste, carbonization, chemical characterization, retort, water retention capacity

10:40 – 11:00

S125- Screening of Plants from Region XII with Potential Anticancer Activity

Loveille Jun A. Gonzaga, Harem R. Roca, Francisco Gil N. Garcia and Lydia C.Pascual

ABSTRACT. Cancer is the leading cause of death globally. Scientific research showed significant results in the utilization of plants, plant products, and their analogues as potent anticancer agents that are effective and safe in the management of cancer. Thus, the current project targets in establishing a Tuklas Lunas Development Center (TLDC) that specializes in the discovery of anticancer agents from plants found in Region XII. Primarily, it aims to produce bioactive non-toxic plant crude extracts that have potential anticancer properties against various cancer cell lines. Setting-up and optimization of the TLDC facility are almost done since most of the equipment, reagents, and supplies have already been delivered. A total of forty-four (44) plant samples have been collected so far. These undergone laboratory processes, from washing, drying, grinding, soaking, filtration, and extraction using rotary evaporator. To date, 30 plant species have been extracted ready for cell-based assays. Currently, the project

is also doing cell culture and proliferation of colorectal cancer cells, HCT 116 for MTT and scratch wound healing assay

Keywords: cell, cancer, plant, crude extract, bioassay

11:00 – 11:20

S122-Screening of Potential Endophytes as Biocontrol Agent against Major and Emerging Leaf Diseases of Rubber

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

ABSTRACT. Rubber production is a profitable agro-industrial venture in the Philippines. However, pests and diseases are major constraints in rubber production resulting in lower latex yield, death of rubber plants, and high production cost. There are some control measures for pests and diseases of rubber. Biological control has been suggested as the most sustainable long-term solution and a direction towards a safe and environment-friendly measure. The objective of this project is to identify potential endophytes for biofungicide to control major and emerging leaf diseases of rubber. On the first six months of the project (year 1), the occurrence and prevalence of major and emerging leaf diseases of rubber in North Cotabato were determined. Endophytic fungi of rubber associated to leaves and barks were also isolated simultaneously for potential use as biocon agent against rubber diseases. Twenty-five (25) rubber farms from five major rubber-producing municipalities of North Cotabato (Kidapawan, Antipas, Makilala, Matalam, and President Roxas) were assessed for rubber leaf diseases and other basic farm information and practices employed were also surveyed. There were eight leaf diseases of rubber observed in this study, with six (6) already known and reported in the country, while two (2) are unidentified. Powdery mildew occurred in all the rubber plantations in North Cotabato. Colletotrichum leaf spot and Corynespora leaf spot occurred in 84% and 56% of the rubber plantations surveyed, respectively. Phytophthora leaf blight, Algal spot, and Bird's eye spot occurred in 16%-20% of the rubber plantations. Highest % disease index (DI) for Colletotrichum leaf spot was recorded in the municipality of Kidapawan while the highest % DI of Corynespora leaf spot was observed in President Roxas but not present in the rubber plantations of Matalam. The Irregular leaf spot disease is most noticeable in Antipas (average DI= 33.2%) where almost 50% of the trees sampled had this symptom. This disease is more pronounced in Matalam and President Roxas. Of all the leaf diseases in rubber, Powdery mildew was the most evident in rubber plantations surveyed. Among the 25 rubber plantations surveyed, Antipas has the highest disease index on rubber leaves and the least in Kidapawan, North Cotabato. Distribution of these diseases in North Cotabato were mapped out for disease surveillance and can be used by the farmers, technicians, and policy makers in the future. Healthy rubber leaves were collected for the isolation of endophytic fungi. A total of 142 isolates were produced in pure culture for characterization and bioassay on the next work package.

Keywords: Disease index, incidence, distribution, endophyte, severity

1:00 – 1:20

S124- Evaluation and characterization of ten promising varieties of cacao in Type II and III agro-climatic zones in Northern and Southern Mindanao

Chris Harvin Rey G. Calvo, Gwen Iris D. Empleo, Romulo L. Cena, Sheena B. Lucena and Jayson S. Baltazar

ABSTRACT. Field experiment was conducted to determine the adaptability and performance of ten promising cacao varieties in the University of Southern Mindanao, Kabacan, Cotabato. The experiment was laid out in RCBD with three replications in 3m x 3m planting distance following Good Agricultural Practices (GAP). Planting survival ranged from 80-100% in the field. W10 was found to be earliest to flower (8.7 MAP), cherelle onset (16.42 MAP) and pod onset (22.57 MAP). Significant differences were observed for leaf, flower, pod and bean characteristics among 10 varieties. Leaf shoot color ranged from light green to dark red and ovate leaf shape was predominant among varieties. CCN 51 was found to have the biggest pod with pod length (232.81 mm) and pod width (101.62 mm). Significant differences were also observed for yield components among the varieties tested. PG610 was found to have the greatest number of beans per pod (45.53) and lowest pod index (16.92). Furthermore, W10 had the most number of pods harvested per tree (38.24) and pod index (18.60) which is at par with check variety BR 25 with 46.58 and 33.58 respectively. Results showed there is a great morphological diversity among the promising varieties which can be used for germplasm collection and future cacao breeding and improvement. Moreover, varieties with good yield performance can be recommended for registration to NSIC and varietal release

Keywords: Cacao varieties, growth, yield, morphological characteristics

1:20 – 1:40

S110-Diversifying the Utilization of Corn as Food and Silage for Food Security

Efren E. Magulama, Nenita E. Olero, Jurhamid C. Imlan, Ivy Mar B. Cabornida, Jessie G. Elarde and Joanne E. Duran

ABSTRACT. The project aimed to create diversified product options of USM developed corn varieties in support to food security. Among corn varieties and its corn-rice-mix proportions evaluated, USM var 6 and Glutinous showed 100% acceptability by the respondents in all rice-corn mixture ratios (25/75 and 30/70 and 50/50). USM var 10 showed 100% acceptability by respondents in 30/70% and 50/50 ratios. USM var 24, however, exhibited 100% acceptability in 25/75 ratio. Of the 16 corn genotypes evaluated for baby and green fodder corn, seven genotypes were identified and selected as potential for baby and green fodder corn production. Among the green corn varieties, USM Glu #1 showed higher green yield when applied with agar-agar and K-humate 100 S soil enhancers showed higher green yields. Higher percent ear marketability (89-91%) of green corn was noted when corn plants were applied with bio-organica and agar-agar soil enhancers. Among the three yellow varieties tested for silage, USM Var 5 had higher herbage yield compared to the two hybrids. The silage evaluation for animal is still on going. The seed maintenance and seed increase of USM varieties are

currently on going to provide quality seeds for the farmers. A total of 300 half-sib families of USM Var 5 and 150 of USM Var 6 were generated as breeder seeds. Parent lines of the two hybrids were continuously purified in support for the technologies being commercialized to the two private companies.

Keywords: Genotypes, soil enhancers, baby corn, green fodder, and green corn

1:40 – 2:00

S127- 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 Rheo Ryan P. Balbuena

ABSTRACT. Long-tailed macaques are known to interact with people in human-habituated environment. These interactions are oftentimes observed in tourist areas such as in parks where
visitors feed long-tailed macaques for entertainment. However, this practice could not only affect the ecology of the species, but also increases the possibility of disease transmission from zoonotic parasites. Thus, this study aims to investigate the occurrence of gastrointestinal parasites (GIT) in human-macaque interface of New Israel, Makilala and Hindang, Leyte, using One Health approach. Prevalence and intensity of parasites in long-tailed macaques, residents and environment will be investigated by means of non-invasive parasitological techniques (FEACT, floatation and microscopy). The study will also deal with the assessment of associated risk factors and the possible cross transmission of parasites using conventional and molecular techniques. From the identified sampling points in Hindang, Leyte, 30 fecal samples were collected from synanthropic macaques but only 4 samples were recovered from forest-confined troops due to the treacherous terrain of the study site. Nineteen (19) fecal samples were collected from residents living near Hindang Nature Park. There was a total of 9 GIT parasites identified, eight (8) protozoans (*Balantidium coli, Blastocystis* sp, *Endolimax nana, Entamoeba coli, Entamoeba hartmanni, Entamoeba histolytica, Entamoeba polecki*, and *Iodamoeba butschlii*) and one (1) helminth (hookworm) species. Though all synanthropic and forest confined macaques were found to harbor one or more protozoans, most protozoan species identified were non-pathogenic. However, this study was able to identify 3 pathogenic protozoans (Balantidium coli, Blastocystis sp. and Entamoeba histolytica) in macaques and a pathogenic helminth (hookworm) both in human participants (5.26%) and macaques (synanthropic (3.33%); forest confined (25%)). Of the identified protozoans, *Endolimax nana* (100%), *Entamoeba polecki* (100%), *Iodamoeba butschlii* (100%) and Entamoeba coli (93.3%,100%) were the most prevalent in both macaque troops. For the environmental samples, the collected soil samples were already processed and will be subjected to microscopy while the water samples were preserved and will be processed once the filtration device is available.

Keywords*:* macaque, human, GIT parasites, FEACT, microscopy

2:00 – 2:20

S131- Pilot Testing and Validation of SSR Marker Kit for Philippine Mango Germplasm in Commercial Mango Nurseries

Emma K. Sales, Marry Grace S. Balbuena, Jane R. Desamito, and Avigel I. Cabrillos

ABSTRACT. The Philippines ranks sixth among the mango producers in the world with combined exports of fresh, dried and processed mangoes. Among the different cultivars grown in the country, 'Carabao' or Manila Super mango is the prime export variety due to its perfect blend of sweetness and sourness and its luscious aroma. Of this popular cultivar, there are 3 known strains namely "Lamao" of Central Luzon, "Carabao Gold" of MMSU, "Sweet Elena" of Zambales and Guimaras. However, many other varieties are also being cultivated and there is a strong suspicion of mislabeling in some commercial nurseries. Therefore, there is an urgent need to address such problem. The cultivars commercially propagated need to be accurately identified and certified true-to-type to avoid jeopardizing the integrity of the nursery where they emanated. A previously completed PCAARRD funded project had determined the robustness of several SSR markers. This study was done to evaluate the accuracy and efficiency of selected SSR marker kit and to validate carabao mangoes and other mango collections planted in different nurseries and clonal gardens. A comparison on the accuracy and efficiency of the selected SSR markers was done between the previous and the recent study. The following results were obtained: both carabao strains and non-carabao varieties gave an ideal and acceptable PIC value of not less than 0.5 similar with the results of the previous study. Likewise, both studies showed high PD values. The previous and recent study also identified six primers AY942817, AB190345, AJ938175, AY942827, AJ635184, and AJ635176 that generated similar unique alleles and detect the same cultivars. Result of the study showed that the marker kit developed is efficient specifically in terms of its efficiency and utility. It also confirmed that the selected primers are efficient and can be utilized a diagnostic marker in
discriminating mango strains. SSR marker kit was also used to validate samples collected from different nurseries and clonal gardens. Based on the molecular analysis done, 9 out of 26 nurseries had mislabeled varieties. The said varieties were then properly identified and labeled using the selected marker kit. Validation of the true genetic identity of recommended varieties/strains is indeed valuable in ensuring that only the preferred and high-quality planting materials are dispersed. This then will ensure that only the genuine varieties or strains are used in either the expansion of mango nurseries and mango orchards. The use of the developed SSR marker kit for mango had proven its utility in discriminating the different varieties. This also paved the way for the validation of the existence of mislabeled varieties and confirmation as to its true genetic identity as well as in identification of the unidentified planting materials in the germplasm.

Keywords: Mango, SSR markers, commercial mango nurseries, DNA analysis

2:20 – 2:40

S133- Phenotypic and Genotypic Analysis of *Coffea canephora* (Robusta) using Morphological and Molecular Markers

Emma K. Sales, Harem R. Roca, Jeannie R. Binaohan, Rheo Ryan P. Balbuena and Jomarie V. Abubakar

ABSTRACT. A research project was conducted to determine the phenotypic and genotypic analysis of *Coffea canephora* (Robusta) using morphological and molecular markers. Both strategies were utilized with the following objectives: a) Inventory and collect Robusta coffee abounding in Region XII for DNA Diversity Analysis; b) Develop protocols for Robusta coffee molecular analysis; c) Screen and evaluate existing SSR markers for Robusta coffee; d) Develop/establish database of molecular characteristics and population structure of Robusta coffee cultivars. A total of ninety-five (95) Robusta coffee samples were collected from Mindanao and other parts of the Philippines. However, only twenty (20) Robusta coffee samples were characterized based on qualitative and quantitative traits because the other samples are still in the nursery stage. For molecular analysis all of the 95 samples were assessed. Sixty-four SSR Primers were screened for their utility. Out of these, 16 SSR primers gave DNA Amplification with polymorphic bands based on the molecular analysis done. Principal Component Analysis (PCA) revealed that bean length, bean width and bean thickness were the predominant characters that distinguish the variability among traits. Cluster analysis grouped the twenty (20) Robusta coffee samples into five (5) clusters based on morphological characteristics. The most variable morphological qualitative traits were color characters and bean-related traits for quantitative analysis. From the molecular analysis, SSR markers revealed the minimal variation among the Robusta coffee strains. A dendrogram based on using UPGMA generated by Jaccard's coefficient was developed. The result of molecular analysis using DI, PD and PIC showed that all SSR primers are useful and efficient in distinguishing the samples. Identity of the Robusta coffee in the different commercial nurseries were detected using SSR markers and the unidentified or mislabeled planting materials were identified and labelled as to their true identity.

Keywords: Robusta Coffee (*Coffea canephora*), Morphological Characteristics, Molecular Analysis, SSR Markers, Dendrogram

2:40 – 3:00

S112- Development of Cost-Effective Pest Management for Rubber and Intercrops

Purificacion O. Cahatian, Lira May A. Sibongga and Merrian Mae Diwa Paule

ABSTRACT. A study was conducted to assess and identify insects of rubber and intercrops; and to compare insect profiles of different rubber-based cropping systems and to evaluate management strategies for rubber annual intercrops, at University of Southern Mindanao Agricultural Research Center (USMARC). Insect assessment for rubber and perennial intercrops (banana, lanzones, cacao and coffee), and annual intercrops (eggplant, corn and mungbean) was carried out from Jaunary to September 2021. Results of the study revealed that almost similar insects were found infesting rubber across different cropping systems: rubber + banana

+ annuals, rubber + lanzones + annuals, rubber + cacao + annuals, rubber + coffee + annuals, and rubber monocrop. Insect pests of rubber as a monocrop, and intercropped with perennials and annuals have similar insect profile, except for the Rubber+Banana where Spiralling Whiteflies were observed. The insect pests of rubber in all models include: 2 species of scale insects, pachyrrhynchid beetles, click beetle, bark borers and bagworm. Insect pests of mungbean as an intercrop across all rubber-based farming system models were similar and include: Black Bean Aphids, Green Soldier Bug, Bean Pod Borer and Thrips. Similarly, insect pests of corn as an intercrop across all rubber-based farming system models were similar and include: Corn Aphids, Corn Plant Hopper and Fall Armyworm. Moreover, eggplant have similar insect profile across all models. Insects of eggplant assessed include: Aphids, Cotton Leafhoppers, Whiteflies and Eggplant Shoot and Fruit Borers, and twig borers. For perennial intercrops, insect pest profile of cacao was almost similar in all models except for the Cacao+Corn, where Nettle Caterpillars were observed. The insect pests common across all models include: Pachyrhynchid beetles, June Beetles, Chrysomelid Beetles and mealy bugs. For coffee as an intercrop, the three models: Coffee+Eggplant, Coffee+ Cassava and Coffee+ Mungbean had similar insect profile which include: Pachyrrhinchid beetles, Mealybugs and Scale insects, while for the Coffee+ Corn model, only one insect was assessed, which is the Pachyrrhinchid beetles. Moreover, for Lanzones as a perennial intercrop, three cropping models, Lanzones + Corn, Lanzones+ Cassava and Lanzones+ Mungbean have only one and similar insect, the Pachyrrhinchid beetle, while the Lanzones+ Eggplant model had three insect pests: Scale Insects, Pachyrrhinchid Beetles and Aphids. Finally, for the Rubber+Banana model, pest profile include: Pseudostem weevil, lace bugs and mealybugs. On the other hand, evaluation of management strategies for insect pests of corn an eggplant using two botanical extracts, revealed the potential of Botanical Extract 2 for the control of Eggplant Fruit and Shoot Borer and Fall Army Worm. Moreover, for the management of major insect pests of eggplant, six treatments were evaluated namely: Untreated Control, Neem Leaves Extract, Curry leaves Extract, Aktrine (Treated Control), Pyro Solution (Commercial Organic Pesticide) and Farmers' Practice (Synthetic Insecticide). For Eggplant Fruit and Shoot Borer, all the treated plants had significantly lower percent infested shoots compared to the untreated control. For the total number of Eggplant Twig Borer, no significant difference was observed among treatment means, however, for the total number of infested plants, Curry Leaves Extract showed potential since it is comparable with the Farmers' Practice (Synthetic Insecticide). For the yield of eggplant, no significant difference was observed on the weight of eggplant fruit, however, promising results were observed for the number of fruits with borer, population count of borer, weight of fruits with borer, wherein all the treated plants had significantly lower results compared to the untreated control.

Keywords: rubber, annual intercrops, perennial intercrops, pest profile, pest management in rubber, pest management in rubber intercrops

3:00 – 3:20

S113-Disease Profile in Rubber-based Farming System in Southern Philippines

Purificacion O. Cahatian, Joan P. Sadoral, Armando G. Valiente, Marife T. Andoy and Merrian Mae D. Paule

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 University of Southern Mindanao Agricultural Research Center (USMARC) from December 2019 to present. Disease assessments for rubber and perennial intercrops (banana, lanzones, cacao and coffee), annuals such as cassava and eggplant, and corn and mungbean were carried-out at four, two and one week interval, respectively. Results of the study revealed that almost similar diseases were found to infect rubber across different cropping systems: rubber + banana + annuals, rubber + lanzones + annuals, rubber + cacao + annuals, rubber + coffee + annuals and rubber monocrop. Disease assessments from January to August 2021, disclosed that the most prevalent diseases across different cropping sysytems are algal leaf spot, powdery mildew and wrinkle spot-like disease. Moreover, perennial intercrops were affected with the occurrence leaf diseases such as sigatoka, freckle and cordana in banana; rust, algal spot, athracnose, leaf blight and sooty mold in coffee; leaf blight in lanzones; and leaf spot and blight 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

3:20 – 3:40

S114-Land Suitability analysis for rubber crops in Agusan del Sur

Adeflor G. Garcia, Nephtalie Morgado and Richie P. Labor

ABSTRACT. The opportunities , potentials and limitations of a parcel of land can be evaluated by using different tools such as multiple criteria evaluation , analytical hierarchy process in a GIS platform. A study on the land suitability analysis of the fourteen municipalities of Agusan del Sur is currently conducted to characterize the key soil constraints and identify the most suitable lands for establishing rubber-based cropping systems for long term sustainability. The study also aims to create the soils, slope, elevation, fertility and suitability maps for the thirteen municipalities and 1 city of Agusan del Sur. Furthermore, a database will be established for the soil pH, rooting depth, N, P, K, electrical conductivity, exchangeable bases, cation exchange capacity, and base saturation. The base map of Agusan del Sur has been delineated using the base map of the National Mapping Resources Information Authority (NAMRIA) . A total of 816 grids were identified to be sampled considering the slope, elevation and soils types . All soil samples were sent to Griffith University , Australia for the laboratory analyses. The fourteen (14) suitability maps for rubber has been created for the use of the municipal local government units and one city. The thematic maps created were: slope , elevation, soil series/types maps of the municipalities and one city. The rainfall and

temperature map were created using the 30 – year world climate data. A seminar-workshop was conducted for the Office of the Provincial Government for the interpretation of the soils map of the province of Agusan del Sur. A series of seminar-workshop are scheduled for the different municipal agriculture offices for the interpretation and use of the different thematic maps created for their respective municipalities.

Keywords: suitability, Agusan del Sur, rubber, GIS, AHP

8:40 – 9:00

S101-Project 1: SMART Irrigation System for Plantation Crops through Hydrometeorological Monitoring

Willie Jones B. Saliling and Kristine Anne C. Ramos-Candidier

ABSTRACT. This project intends to develop a precise irrigation system framework by deciphering the complex relationship of yield response, on-farm patterns of temperature, humidity, rainfall and soil moisture. Plantation crops such as rubber, banana, coffee, cacao, and lanzones are highly sensitive to rainfall, soil moisture, and humidity. But since these crops are usually grown in a rainfed environment, growers are at the mercy of the weather which held them helpless. Better water management through precise irrigation is seen as a panacea of the farmers' woes. Since January 2021, this project has developed the systems design for the irrigation plots for the six commodities. The layout of the irrigation system was sketched along with the data acquisition and control points. Automation sensor control for NPK, humidity, temperature, soil moisture were integrated with the design of the data hub infrastructure networks. Meanwhile, the regional pedoclimatic maps were also done to refine the data analysis at the plot-scale. It is hoped that upon commissioning of the irrigation systems, sensor, and controls, robust tdata analytics can be employed for better water management towards optimal yield.

Keywords: drip irrigation, SMART Agriculture

9:00 – 9:20

S103- Identification of the Strengths and Limitations of the Potential Areas for Some High Value Crops (Cacao, Coffee, Cardava-Banana, Longkong-Lanzones, Rubber and Pummelo) in Southern Mindanao

Rezin G. Cabantug and Adeflor G. Garcia

ABSTRACT. While global production is still low to accommodate the increasing demand for food, with pressing concerns in land utilization and nutrient management in the country. Conversion of agricultural land to commercial, industrial and housing units were even getting larger than crop production. The establish the capability potentials, limitations and constraints of each production areas and capacitation of LGU's towards enhanced productivity and sustainability of High Value Crops in Southern Philippines was conceptualized. Pre-mapping was conducted for region 11 and 12 with 606, 834.15 hectares undifferentiated mountain soils

verified. There were 165 thematic maps generated from elevation, slope, land use, rainfall, and temperature which are now available in the Land and Water Resources Management Information website of the project. Fourteen (14) high value crops coordinator and technicians were trained on the use of the different generated thematic maps, and capacitated on the advance technologies such as ArcGIS, QGIS and SW Maps software for their programming and monitoring activities.

Keywords: Crop suitability, high value crops, soil series, soil survey, land use

9:20 – 9:40

S104-Smarter Approaches to Reinvigorate Agriculture as an industry-Phase II: SARAI – Enhanced Agricultural Monitoring System in North Cotabato

Purificacion O. Cahatian, Romulo L. Cena, Rezin G. Cabantug and Dennis F. Sarmiento

9:40 – 10:00

S107- Improvement of Carabao Mango Fruit Quality and Production through Development Molecular Markers Associated with Scab and Stem-end Rot Disease Resistance by Genome Wide Association Studies (GWAS)

Edward A. Barlaan, Joan P. Sadoral, Joelle L. Aguirre and Jeralden O. Vido

ABSTRACT. Declining production yields and poor quality of Philippine 'Carabao' mango fruit had been a challenge and mainly attributed by high pest and disease pressure i.e stem-end rot and scab disease. The study was conducted 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 its degree of infection. Percent susceptibility of the evaluated varieties ranges from 85% to 100%. It was observed that 'Carabao' mango varieties were susceptible to stem end rot disease. On the other hand, isolation and inoculation of causal pathogen of scab disease, and evaluation of mango varieties for resistance to scab disease is still on the process of optimization. Development and design of molecular markers was done as another option to detect *Elsinoe mangiferae* (causal pathogen of scab disease) in leaf samples. Two molecular markers (forward and reverse) were designed and developed through multiple alignment analysis using DNA sequences of *Elsinoe mangiferae* available on published literatures. These markers were validated using subcultures of suspected *Elsinoe 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 for the in situ evaluation of resistance against scab disease. Natural observation of scab disease on 'Carabao' mango varieties was also done as another approach for evaluation of resistance against scab disease. Twenty one 'Carabao' mango varieties were evaluated for its resistance against scab

disease. Results revealed that '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: 'Carabao' mango, stem-end rot, scab, Genotyping-by-sequencing (GBS), Genome Wide Association Studies (GWAS).

10:00 – 10:20

S108- Fruit Quality Improvement in Carabao Mango through Quantitative Trait Loci (QTL) Identification for Scab and Stem-end Rot Resistance by Genotyping by Sequencing GBS Genom-wide Association Studies (GWAS)

Edward A. Barlaan, Mary Grace S. Balbuena, Michael James L. Abrea and Evelyn F. Alejandro

ABSTRACT. Mango (Mangifera indica) is one of the economically important fruit crops for local consumption and export. However, mango production in the Philippines is constrained by postharvest diseases affecting fruit quality and yield. These diseases include stem-end rot (SER) and scab caused by *Lasiodiplodia theobromae* and *Elsinoë 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 aims 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. Non-carabao varieties and strains were used as potential source of resistance to SER since the carabao mango are mostly susceptible to SER. Various mango trees were tagged and characterized thirty-two derived from BPI-Giumaras, twenty six (26) from Region XI and 34 from Region XII. Fifty two (52) non-carabao mango fruits derived from Guimaras and Regions X, XI and XII were inoculated in vivo with stem-end rot. Results showed that 30 varieties were highly susceptible, 4 susceptible, 6 moderately susceptible, 6 moderately resistant and 6 resistant to SER. Scions from same trees including other mango strains and varieties were grafted for in situ inoculation of mango scab. Typical symptoms of scab were isolated for morphological characterization, pathogenicity test and molecular identification. A total of nineteen prospective scab isolates were sent for DNA sequencing. Disease reaction and molecular assays for mango accessions are still in progress.

Keywords: Mango, Stem-end rot, scab, Genotyping-by-sequencing (GBS), Genome Wide Association Studies (GWAS).

10:20 – 10:40

S111-Selection for Glyphosate Tolerance and Corn Borer Resistance in Corn Segrating Populations

Jessie G. Elarde and Edward A. Barlaan

ABSTRACT. Corn is an economically important crop consumed as human food and animal feed. There is a need to increase production due to strong demand for food security and feed supply in the country. However, corn production is constrained by biotic factors such weeds and pests affecting productivity and quality. Current approaches in addressing these constraints in corn production involve planting of varieties with herbicide resistance or tolerance to pests. Hybrid populations with glyphosate resistance and/or resistance to corn borer were used as base populations for selection of tolerance and resistance in selfed families or progenies. This study aimed to identify corn borer resistant and glyphosate tolerant inbreed lines with the ultimate goal of developing high yielding open-pollinated varieties and hybrids. As source of corn borer infestation, the experimental area was planted with susceptible corn borer spreader rows 45 days ahead of the S3 families of populations 2101S3, 2103S3, 2105S3 and 2107S3 for evaluation and selection of corn borer resistance. The same entries along population 2109S3 were applied with glyphosate herbicide 15 and 35 days after planting for selection of herbicide resistance. Results showed that 98.5% of inbreeds expressed no indication of corn borer feeding. Likewise, there were no plant mortalities observed in all 3,779 corn inbreeds sprayed with glyphosate herbicide. Results suggests fixation of genes for herbicide resistance and tolerance to corn borer occur in selected families. Based on good agronomic traits, a total of 1,449 plants from five populations were selected for S4 family evaluation.

Keywords: Weed control, corn borer resistance, self-pollination, glyphosate herbicide tolerance.

10:40 – 11:00

S130- Development of Innovative approaches for clonal propagation of industrial and fruit crops

Sheena B. Lucena, Ferdinand A. Duldulao and Edward A. Barlaan

ABSTRACT. There is a strong demand of propagated seedlings for industrial and fruit crops. There is a need to develop different innovation approaches to enhance the production of quality planting materials. The study aims to develop propagation techniques utilizing plant growth hormones; to evaluate different potting materials to improve rooting system; and to utilize the best concentration of hormone and potting materials in propagating five crops. Different hormone concentrations were used such as (12.5mg/L, 25mg/L and 50 mg/L.- IBA) and (20+12.5mg/L, 40+25mg/L and 80+50mg/L - BA+IBA). Potting materials were used for the assessment of different root parameters (V-shape root trainer cup, bottom plastic bottle, top plastic bottle, net bag and polyethylene bag). Cacao obtained the highest percentage survival of 87.50 in hormone concentration of 25 mg/L IBA which was significantly differed compared to control. Lanzones had positive response in terms of scion shoot length with 11.90 which was

observed in hormone 25 mg/L-IBA. Pummelo also gave the longest scion shoot length of 19.30 applied in hormone 40 mg/L+25 mg/L and obtained the most number of leaves with 22.17 at hormone concentration of 20 mg/L + 12.5 mg/L-BA+IBA. Durian had no significant difference observed in all treatment means. No significant effect between hormone and crop interaction in relative difference between scion union and the rootstock. Meanwhile, biggest stem diameter and plant height of all crops were obtained in polybag. Longest root length in durian was observed in top plastic bottle and V-shape root trainer. Root length in rubber was significantly longer in all potting materials except the top plastic bottle. Durian and rubber had the heaviest fresh biomass weight regardless of potting material. Highest number of leaves was noted in durian. Graftability and buddability were obtained in durian and rubber which attained the standard diameter and height in all potting materials. Grafting of cacao, durian, lanzones, pummelo and budding in rubber have been done in selected hormone and potting materials

Keywords: Cacao, rubber, durian, lanzones, pummelo, hormone, potting material

11:00 – 11:20

S121-Performance Evaluation of Fermented Teas as Biofertilizer and Biopesticides and their Effects on Pests, Diseases and Yields of Selected Solanaceous Vegetables

Purificacion O. Cahatian, Maria Irinea S. Candolita and Naomi G. Tangonan

11:20 – 11:40

S123-Collection, Evaluation and Maintenance of Cut Foliage and Flowering Pot Ornamentals at USMARC Center

Nancy E. Duque and Lorelyn Joy N. Turnos

ABSTRACT. This project was conceptualized to establish and maintain a collection of cut foliage and flowering pot ornamentals at the University of Southern Mindanao Agricultural Research and Development Center (USMARDC). Specifically, it aims to collect different accessions or varieties of cut foliage and flowering pot ornamentals, evaluate the collected ornamentals, and maintain and conserve the ornamental collection. Foliage ornamentals collected from various sources consisted of the following; 50 accessions of coleus, 26 aglaonema, 10 crotons, 4 for cordylines, 3 papua, 11 dracaena, 9 diffenbachia, 12 philodendron, 3 syngonium and 8 calathea. On the other hand, the flowering pot ornamentals collected are as follows: 8 accessions of hibiscus, 24 bougainvillea, and 10 begonias. Bed flowering ornamentals such as portulaca (5), zinnia (6), cosmos (3) and celosia (3) were also planted. Preliminary evaluation of the different accessions showed morphological variation in quantitative traits such as leaf length, leaf width and petiole length. Large variability was also noted in qualitative characters like leaf shape, leaf margin, leaf base and leaf apices.

Keywords: collection, accessions, ornamental, maintenance

1:00 – 1:20

S126- USM-Treelife Biotechnology Development program: Isolation and molecular Characterization of potential plant growth promoting Microorganisms from Coconut Industry Waste

Maria Elena N. Tanabe, Cromwel M. Jumao-as and Jerry John M. Taray

ABSTRACT. The utilization of microorganisms to promote growth and increase crop production has begun to be studied. Microorganisms isolated from varying sources of organic matter differ. This project aims to produce an effective bioinoculant for agriculture and other related industries by utilizing microorganisms present in coconut industry wastes. Initially, this project started with identifying microorganisms to examine their potential biotechnological applications such as biofertilizer and/or biocontrol agents. Isolated bacteria and fungi were molecularly characterized and identified using 16S rDNA gene and ITS gene, respectively. There were 24 bacterial isolates and 10 were identified to have potential growth promoting properties based on literature review. There were 14 fungal isolates and 1 was identified to have potential growth promoting properties while the other 3 were identified to have other biotechnological uses based on literature review. The potential microbial isolates will further be studied to (1) validate their plant growth promoting activities and other biotechnological uses, (2) develop effective bioformulations, and (3) assess their efficiency in the greenhouse and field tests eventually producing of effective bioinoculants for agriculture and other related industries application.

Keywords: Biotechnology, Microbial Inoculant, Biofertilizer, 16s rDNA, Industrial Waste

1:20 – 1:40

S128- Productivity of Crossbred Sheep and Goats Fed Brachiaria Hybrid CB. Mulato II (*Brachiaria ruziziensis* X *B. brizantha* X *B. decumbens*) Fertilized with Varying Levels of Nitrogen

Josephine R. Migalbin, Roy C. Ricabar, Julius Jerome G. Ele, Geoffray R. Atok, Jurhamid C. Imlan

ABSTRACT. Small ruminants form an important economic and ecological niche in small farm systems and agriculture. Their current low level of contribution is dismal, and is not commensurate with the potential capacity for higher levels of production, thus, it is imperative that their productivity should be improved. Nutrition plays an important role in increased productivity of livestock and the need for quality forage and concentrate should be an integral component of their feed. Mulato II is a Brachiaria hybrid with potential of improving livestock productivity. Since it is a grass, its nitrogen requirement should be met. Four nitrogen levels (0, 75, 150, 225 kh N/ha) was studied to determine their effects on plant height, number of tillers and herbage yield on Mulato II. NO significant difference was observed in plant height but the optimum level of nitrogen at 150 kg N/ha significantly increased number of tillers and herbage yield of Mulato II. Data on the productive performance of goat and sheep and their carcass characteristics are not yet available as these components are still ongoing.

Keywords: Brachiaria hybrid, Mulato II, herbage yield, number of tillers, small ruminant

1:40 – 2:00

S115-Etiological Studies and Management Strategies against Major Diseases of Dragon Fruit

Jasmin A. Pecho, Ardniel A. Baladjay and Samsudin S. Panday

ABSTRACT. The research on "Etiological Studies and Integrated Disease Management of Major Diseases of Dragon Fruit" aims to a) assess the extent of damage of major diseases of dragon fruit in North Cotabato, b) identify the morphological and cultural characteristics of the suspected pathogens that causes the dragon fruit diseases, c) formulate the biological control, fermented teas and strategies against the suspected pathogens of dragon fruit that causes diseases, and d) develop IEC materials on diseases of dragon fruit. Actual field surveys were conducted to different areas in North Cotabato with dragon fruit production. To facilitate the data gathering, a coordination meeting was done with the Office of the Provincial Agriculturist and the concerned Local Government Units in Cotabato Province. The following dragon farms were visited: 1) USM-CA-SDC, USM, Kabacan, 2) Marbel and Boragay, Kidapawan City, and 3) Tigbawan and Kimarayag, Pigcawayan, North Cotabato. The field survey results revealed that a seven (7) year old dragon fruit farm was established in Brgy. Marbel, Kidapawan City with more than 1,500 posts in 1.8 hectares. Canker was the most common disease found in three visited municipalities. In etiological study, canker is caused by the *fungus Neocytalidium dimidiatum*. A bioassay was conducted and found out that Biocon1 and Biocon2 were significantly comparable to chemical3 (chemical check). Further, a nursery trial was conducted. Initial result showed that chemical1, chemical2, biocon1, and biocon2 were comparable to chemical3 (chemical check). The collection of field data is still ongoing.

Keywords: dragon fruit, biological control, canker, *Neoscytalidium dimidiatum*

2:00 – 2:20

S132- Validation of Molecular Markers for Identification of Cacao HYVs, Criollo Types and Disease Resistant Varieties Through Marker-assisted Breeding

Edward A. Barlaan, Amy E. Elivazo and Allen Jay E. Austria

ABSTRACT. Molecular markers were generated from the completed DOST-PCAARRD funded project to identify National Seed Industry Council (NSIC) recommended cacao varieties, true Criollo types, and cacao accessions with resistance to cacao vascular streak and phytophthora diseases. There is a need to validate these markers for utility in the identification of authentic cacao varieties and Criollos and marker-assisted selection/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 authentic or true-to-type 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 Region XI were communicated for collaboration. Samples were randomly collected with 5-10 plants per variety. Leaf samples were used for DNA extraction, PCR amplification and fingerprint analysis. A total of 21 UF18 and 17 BR25 seedlings collected from Region XI were validated. SSR marker C7729t1 was able to confirm authentic UF18 and C8223t1 for BR25 yielding allele in 4250bp and 600bp, respectively. Thirty SSR markers were used to screen claimed criollo collected from different regions. Initially, 96 claimed criollo were screened using the SSR markers. Twenty-one cacao accessions from University of Southern Mindanao genebank were collected, extracted and screened for marker-aided assisted screening for diseases. SSR markers C10238t1 and C1618t2 were used for screening Phytophtora palmivora; and C4101t2, CDRAat11 P3T7 C74, and C1223t3 for Lasiodiplodia theobroame.

***Keywords**:* Cacao, SSR markers, Criollo, NSIC, vascular streak disease, phytophthora

10:00 – 10:20

S201- Enhancing RD&E indexing system (RDEIS) of USM: Design, development and evaluation

Melecio A. Cordero Jr., Ryan Z. Gonzaga and Eugene G. Ranjo

ABSTRACT. In USM, the Research and Development Office (RDO) has outlined in its strategic plan in knowledge management (KM) to create, share, use and manage the knowledge and information of an office. To keep a reliable record of the research information in the university, the office has adopted an indexing system for the undergraduate theses. This study is aimed to review and enhance the existing indexing system to include the graduate theses and dissertations. This enhanced indexing system also captures the funded research and extension projects in the university. The system will also be evaluated for its functionality and usability.

***Keywords**:* indexing, thesis, research, project, record

10:20 – 10:40

S202- Digitalization of USM Faculty Workload

Hazel Ann S. Soriano, Ryan Z. Gonzaga and Arjay S. Agbuang

ABSTRACT. Digital technology alleviates the life of teachers when incorporated to education; it helps keep the work organized, convenient, and efficient. Digitalization of faculty workload will help speed up the process of preparation and review. The faculty loading is a challenging task every department chair face every semester and reviewing these workloads is a very meticulous task done by the Academic Compliance and Monitoring Head. This study was conducted to develop a digital system for USM faculty loading. Specifically, this study aimed to gather the needed information for the development of data base system for faculty loading; develop a digital system for summary of faculty workload and individual time and location; and evaluate the performance of the developed digitalized software for faculty loading. The first

step of the study was to review the process of faculty loading and its perennial problems or bottlenecks. A master list of faculty per department with details such as highest degree attainment, rank, designation, load displacement, number of preparation, actual and total load, normal load, over or underload units was created. The database schema of the Faculty Workload System was developed using the gathered data in the first quarter. The developed faculty loading software was designed based on how it can generate the faculty individual time and location. It represents the logical configuration of all part of the relational database of the system. Additionally, the source code of the Login page of the system was made. Moreover, the source code and the output of the Workload page was crafted. The developers enhanced the entire system by writing code using the PHP programming language. The digitalized software was initially tested for usability, errors and bugs. Based on the initial testing, the developers improved and enhanced the software. The instrument was also validated by experts to ensure that it will measure the performance of the software. A demonstration on how to use the software was conducted. The developed software was then evaluated by nineteen (19) by target end-users- the department chairs and Director for Instruction Staff of the University of Southern Mindanao including external campuses using 20 items survey questionnaire. Each item is measured on the scale from 1 (strongly disagree) to 4 (strongly agree). There were four (4) factors under this instrument, namely, functionality, reliability, usability, and portability. The survey questionnaire aimed to determine the level of performance of the software. Based on the result of the evaluation, of the four (4) factors, usability had the highest mean (3.52) followed by functionality (3.45) and Portability (3.32) with the description very high respectively. However, reliability got a mean of 3.13 with the description high. This means that the software Faculty Workload System is usable, functional, portable, and reliable. The overall mean of 3.36 indicates that the developed software excellently meets the standards and is fit for use.

Keywords: Digitalization, Development, Software, Faculty Workload, USM

10:40 – 11:00

S204- Design and Development of USMCEE online Registration

Arjay S. Agbunag, Clarence Dave C. Galas and Alvin C. Mibalo

ABSTRACT. Registration is a method of recording a name or information on an official list. This is a process of submission of related information as requirement to be officially enlisted. In USM, an applicant can be accepted to enroll in college after he/she has taken and passed the entrance examination. The schedule of entrance examination and the number of applicants are limited and monitored. As a result, USMCEE Online Registration has been developed to address problems on USMCEE. The study sought to provide an online facility on online registration for USMCEE applicants. Specifically the study sought to develop an online portal on USMCEE online registration, to deploy the system in a working environment and to develop a user manual. The study uses the agile development methodology for the development of the system. This methodology include phases like planning, designing, coding and testing of the researcher conducted brainstorming with some group of people for the development of the system. The online USMCEE registration system includes the registration process and selecting of schedule of USMCEE applicants. The system also helped the UTDC and ARO personnel to

manage the information of the applicants. User guide was also include in the development of the system.

Keywords: online registration, entrance test, online portal, entrance examination, automation

11:00 – 11:20

S207- Maguindanaon Food Products and Delicacies: Standardization and Promotion for Commecialization

Roy B. Gacus, Francisco Gil N. Garcia, Esmaira G. Gunsayan, Geraldine M. Quiñonero, Merlyn A. Musali and Leonora M. Silvano

ABSTRACT. The main purpose of this project is to promote Maguindanaon food products and delicacies by developing IEC materials and recipe book for public knowledge, awareness, and understanding. As well as, to standardize the food by getting the most frequent measurements of raw materials, ingredients, utensils/equipment, and procedure used by the producers. This project identified the sources of Maguindanaon food products and delicacies through field interviews from the referrals, and desk's review of secondary information taken from the internet. Relevant information like customary preparation, raw materials, ingredients, cooking utensils and equipment were provided by the local producers in developing food products and delicacies, as well as the standardization. Results revealed that there are twelve (12) sources (local producers or owners) were identified and located at Maguindanao, Cotabato and Sultan Kudarat Provinces. These sources produced twelve (12) Maguindanaon food products and delicacies. About eight (8) products/delicacies were subject to standardization based on the modal value and evaluation from the food expert namely: kagikit, pastil/patil, tinapayan, chicken linigil, panyalam/panialam, tinadtag, kumukunsi, and patulakan. Enterprise budget for kagikit, pastil, panyalam/panialam, tinadtag and patulakan were provided and showed a promising profit.

Keywords: Enterprise budget, Maguindanaon food products and delicacies, promotion, and standardization

1:00 – 1:20

S210- Commercialization of Chayote Products

Jenny B. Mamacus, Emilie S. Estelloso, Janice E. Reynes, Jo-Ann D. Santos and April Geraldine M. Quiñonero

ABSTRACT. Chayote (Sayote) products: Leaf Tea, Jam, Sauce/Ketchup and Pickle Relish was the focus of this study. It aimed to develop and standardize the formulations and processing methods, determine its product quality through objective and subjective evaluation, determine the appropriate packaging materials and label, determine the degree of consumer preference, determine the consumer's emotion/acceptability, and evaluate the profitability and return on investment (ROI) of the products. Series of trial and error were conducted to achieve the standardized formulations and processes of the products. For the objective

evaluation, the result revealed that all standardized formulations and processing methods reached or passed the required standards for proximate and physicochemical properties of the Chayote (Sayote) Jam, Sauce/Ketchup and Pickle Relish. Similarly, the Chayote Leaf Tea's standardized formulations and processing methods reached or passed the required standards for phytochemical properties. For microbial evaluation, the result revealed that microorganisms are lesser or not detected in a glass/bottle container for the Jam and Pickle Relish, Zip Lock for Sauce/Ketchup and tea bag for Leaf Tea. Subjective evaluation of the product was done through organoleptic evaluation with fifteen (15) respondents in 3 replications. The gathered data were analyzed and interpreted through inferential statistics. The result then revealed that Chayote Jam is best in Pectin formulation, Chayote Pickle Relish is best in quick pack process or unfermented method, Chayote Sauce/Ketchup is best in sour formulation, and Chayote Leaf Tea is best in Black Tea process. Although, the result also revealed that qualities evaluated for Chayote Jam, Ketchup/Sauce, and Leaf Tea have no significant difference among the treatments. Dissimilarly, in the Chayote Pickle – Relish, it was revealed that there is a significant difference among the treatments thus null hypothesis was rejected. Consequently, the Chayote Jam packed in glass container with the pectin formulation, Chayote Pickle Relish packed in glass container with the fresh formulation, Chayote Sauce/Ketchup packed in zip lock pouch with sour formulation, and Chayote Leaf Tea in tea bag with black tea process will be subjected for appropriate labeling, consumer preference test, consumer's emotion/acceptability test and computation of profitability and return on investment (ROI).

Keywords: Chayote Products, Chemical Analysis, Organoleptic, Consumer Preference, Marketability

1:20 – 1:40

S211- Standardization Protocol for the Development of USM Food Products

Harem R. Roca, Frederick John B. Navarro, Bryan Lloyd P. Bretaña and Marlon L. Manansala

ABSTRACT. The project was conducted to assess the various protocols /procedures developed by the HVCFPC; compare and evaluate the existing recipes adopted for every selected product with the improved/ new version; develop a standardized processing protocol for processed products; upgrade equipment, laboratory operation; and improve product packaging. For turmeric, upgrading of personnel protective equipment (PPE), laboratory operation, machine equipment, and packaging was carried out and were put in place. Cacao post-harvest handling methods, tablea preparation, processing equipment and packaging were enhanced. Likewise, ice cream was formulated using marang fruit as natural flavor in conjunction with other ingredients. Optimization of the most acceptable rate of marang was explored. Initial results through sensory evaluation were promising. Cacao wine study was set-up but due to Pandemic, some interventions in the process were omitted resulting in low quality wine. However, a new set-up was conducted and observation is on-going.

Keywords: cacao wine, ice cream, equipment, laboratory, marang, packaging, post-harvest, product, protocols , tablea, upgrade

1:40 – 2:00

S212- Evaluation of Microbial, Physical, and Chemical Properties of USM High-Value Crops Processing Center Food Products for Quality Control Measures

Bryan Lloyd P. Bretańa, Frederick John B. Navarro, and Harem Roca

ABSTRACT. Food safety is of global importance for the prevention of foodborne illnesses. Food safety is instrumental in promoting public health and marketing of safer food products. The University of Southern Mindanao High Value Crops Food Processing Center (HVCFPC) had developed several food products, however, standardization of production protocols and assessment of overall microbial, physico-chemical, and sensory quality of these food products are essential to ensure general acceptability and overall safety. This study aimed to determine the microbial quality and physicochemical properties of the food products developed by USM HVCFPC. This was done by detecting indicator organisms and evaluating the products' physico-chemical properties. Results revealed that turmeric tea passed the microbial quality standards set by Food and Drugs Authority. Different tablea produced via several bean handling techniques and developed natural-flavored vinegar had passed most of the parameters required. No pathogenic microorganisms such as coliform and Salmonella were detected. Expectedly, high yeasts and molds count was observed in vinegar treatments especially at the earlier stage of fermentation process. Measured physico-chemical parameters of the vinegar products were within the standard and high polyphenol content was observed at later fermentation stage which might indicate potential antioxidant property. Generally, USM HVCFPC products were acceptable, but protocols need to be optimized to ensure overall quality and safety.

Keywords: food safety, microbial quality, turmeric tea, tablea, vinegar

2:00 – 2:20

S213- Optimization of Natural Flavored Vinegar and Commercialization of USM Products from High Value Crops

Frederick John B. Navarro, Bryan Lloyd P. Bretana, and Harem R. Roca

ABSTRACT. The natural flavored vinegar production was investigated using different experimental setups to optimize the procedures for the following process: substrate selection, fermentation acceleration, and preservation. The quality of the vinegar was monitored through pH, Brix, acidity, and total phenolic content (TPC) with the analytical techniques such as potentiometry, refractometry, titrimetry, and spectrophotometry, respectively. Rice (R) with turmeric (T) or insulin (I) plant extracts can be used as a substrate for vinegar production. The fermentation process of rice and plant substrate can be accelerated through using starter C (alcohol fermentation pathway) as initiator and starter B (acetic acid fermentation pathway) as a booster. Other combinations of starters with effective acetic acid fermentation were CB> CA=AB>AA. Starter C can extract the polyphenols in the plants thus increasing the total phenolic content of the vinegar with a potential synergist to phenolic contents of starter B. Pasteurization and clarification process affects the vinegar quality and the reduction of the product volume. Heating the vinegar tends to preconcentrate the

solution thus increasing the acidity of the product. Clarifying agent neutralized the acidity thus increasing the pH of the vinegar. Vinegar were produced with treatments: R:CB (pH=2.51, acid=2.43%, TPC= 395.18mg/L GA); RI:CB (pH=2.51, acid=3.39%, TPC=674.44mg/L GA); and RT:CB (pH=2.55, acid=2.49%, TPC=618.31mg/L GA). The existing labels of HVC products have limited information in reference to DOH AO 30 s 2014. These products have a large potential for e-commerce in consideration of the cost, packaging, and labeling. More respondents are required to establish predictive values for the personality traits and motives of customers in emerging food and flavors.

Keywords: Fermentation, Turmeric, Insulin, Polyphenol, Label

2:20 – 2:40

S214- Market Potential and Product Acceptability of UF18 Cacao Variety

Cheryl Y. Dulay, Ivy Mar B. Cabornida and Jigzcel Divine F. Basoy

ABSTRACT. To keep the pace with the surge in cacao on both local and global demand, Philippines increased its production by providing funds for the Philippine cacao industry. Most of the cacao planting materials distributed were UF18 cacao varieties. Although UF18 has the highest yield per tree per gram and has the highest bean size compared to other varieties, many local chocolate producers are hesitant to buy due to its unfavorable taste for chocolate production. The study determined its market potential and product usability for cacao mass production which is the main ingredient for chocolate. It benchmarked the existing protocols practiced by the large and small-scale processors in making cacao mass for sikwate. After harvesting, most store the pods for 1-3 days before breaking and getting the beans. Draining for 12- 48 hours is done before beans are subjected to fermentation which ranged from 3 – 7 days; some used thermometers to monitor the heat during fermentation while others used personal instincts based on their experiences. For large scale processors, doneness of fermentation is determined using cut test, while small scale processors used their sense of smell. Almost all practiced sun drying. The fermentation techniques made use of wooden cone, wooden box, plastic sack, “bukag”, styro foam/ice chest and plastic bag. Analysis on sensory qualities of sikwate revealed significant differences in appearance, consistency, flavor and overall acceptability at 5% level of significance and significant difference in odor at 1% level of significance. Sikwate from undrained-fermented cacao beans have higher rating on appearance, consistency, flavor and overall acceptability ratings than those from drained-fermented UF18 cacao beans. The UF 18 cacao mass, chocolates of all variants, vinegar, wine, cacao butter, briquettes and by-products are widely available both in local and global market.

Keywords: Cacao, market potential, UF18 cacao variety

2:40 – 3:00

S205- Development of Low-Cost Tilling Machine for Optimum Vegetable Gardening

Joel V. Misanes and Ma. Dely P. Esberto

ABSTRACT. The project intended to develop a low-cost tilling machine for soil cultivation useful for backyard vegetable gardening. Specifically, it aims to design a tilling machine, construct the machinery, test the workability, and revise the parts for better tilling performance. The development of tilling machine was the conceptual response of the researchers to create a technological and innovative resources in aid of machine invention which are useful to the end-users, academe, small medium enterprise, and entrepreneurs much more with the farmers engaged in vegetable gardening. It is also aligned to the Philippine Medium-term Development Goals that seeks to promote science and technology and creative arts to enhance innovation and creative capacity towards sustaining, inclusive development. The project development covered the design and fabrication of the tilling machine. The preparation of the shop drawings included the pictorial, exploded, orthographic and detailed drawings. These were used as guides in constructing the machine which covered the preparation of materials, body building, machining, assembling, installation of the engine and the finishing touches of the final fabrication. The tilling machine was designed based on the standard specifications which was done from January to March 2021, while the construction of the machine started on April 2021 and completed in June 2021. The body frame assembly is consisted of the main frame, mounting rail, top plate, handle, and wheel bracket and wheel. The body frame is made of a 38 mm angle iron cut to sizes and welded for permanent fastening. Field testing of the tiller machine showed a field efficiency of 72.45% on a 120 sq.m. unopened area covered with long tiger grasses.

***Keywords**:* tilling machine, farm implements, field efficiency, vegetable gardening, soil cultivator

3:00 – 3:20

S234-Molecular Detection and Identification of Microbial Pathogens of Banana

Edward A. Barlaan, Michael James L. Abrea and Evelyn F. Alejandro

ABSTRACT. Banana production in the Philippines is affected by different diseases causing significant reduction in productivity. Major losses have been attributed to Panama disease caused by *Fusarium oxysporum f sp. cubense*, Black sigatoka by *Mycosphaerella fijiensis*, Moko or bacterial wilt by *Ralstonia solanacearum* and bunchy top caused by Banana bunchy top virus. There is a need to develop molecular detection technology that can quickly, safely and reliably identify and detect in real-time the causal pathogens in banana and soil before disease expression and outbreak. The study aims to isolate and molecularly identify the causal pathogens, verify pathogenicity of the isolates and develop primers and probes for detection in real-time quantitative PCR (qPCR) and digital PCR. Diseased plant samples were collected from different regions in Mindanao for the isolation and purification of pathogens. Purified isolates were PCR-amplified for DNA sequencing targeting the ITS gene for *Fusarium oxysporum f.sp*. *cubense* and *M. fijiensis*, 16s rRNA gene for *R. solanacearum* and coat protein

gene for banana bunchy top virus. Identities of the isolates were confirmed through BLAST analysis. These isolates were used for pathogenicity tests in banana healthy seedlings, which expressed the diseases after inoculation. Primers and probes for each pathogen were designed from the confirmed sequences for real-time qPCR and digital PCR analysis. All microbial pathogens were successfully identified and detected in qPCR except *M. fijiensis*, which needs further modifications in primers and probe. The qPCR assay is very sensitive while probes are effective in detecting the pathogens even at femtogram DNA level. Digital PCR effectively detected the loads of these pathogens in infected samples and even in phenotypically healthy plants yet infected based on molecular assay. This study is the first report so far in the world on the digital PCR detection of causal pathogens of major diseases in banana. These new detection technologies will boost the banana industry through rapid and accurate detection of pathogens for disease monitoring to provide preventive or control measures leading to increase productivity and profitability.

Keywords: Bunchy top, digital PCR, Moko, Panama disease, qPCR, sigatoka

3:20 – 3:40

S230- Development of Data Hub for Smart Agriculture Technologies

Melecio A. Cordero, Jr., Jerry T. Piamonte and Clark Kneil L. Caoile

ABSTRACT. The study, Development of Data Hub for Smart Agriculture, was conducted and tested at the College of Engineering and Information Technology and Organic Building, on January to June 2021. The general objective of this study was to establish a data hub for smart agriculture technologies. Specifically, it aimed to: (1) implement a local area network with database and server for processing and storing of real-time data; implement a wireless connectivity in the experimental fields; and develop an automated application for monitoring and dissemination of information. In the development of the project, the researchers used different software applications such as WordPress for the website creation, Cisco Packet Tracer for the design and routing of the data hub and Arduino IDE for the coding of the microcontrollers for the field sensors. For data gathering, data collected from the other components were inserted and uploaded to the website and data collected from the sensors were stored at the data hub for easier access.

Keywords: database, local area network, website, arduino, sensor12

3:40 – 4:00

S233- Upgrading of Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKARGEN

Francisco Gil N. Garcia, Adeflor G. Garcia, Purificacion O. Cahatian and Dennis F. Sarmiento

ABSTRACT. The upgrading of the geographic information technologies for high value commodities and indigenous crops in SOCCSKSARGEN included two component projects. The

first component project was the "Establishment of the Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKSARGEN funded by the Department of Agriculture - Bureau of Agriculture Research thru the Institutional Development Grant with 8M budget. The second component project was the "Upgrading of Geographic Information System at the University of Southern Mindanao" with 5 M fund allocation thru the Agricultural enhancement Fund of the Department of Agriculture (ACEF). The establishment of the "Geographic Information Support System Center for High Value Commodities and Indigenous Crops in SOCCSKSARGEN "is envisioned to house the geographic soils information center, soils and insect museum and the smart and digital agriculture hub which will lead in the multifaceted activities with emphasis on precision agriculture. It is designed to be the learning hub/center of soil and climate change adaptation in research and extension activities responding to one of the strategic framework of the PDP 2017-2022 to wit: "expanding economic opportunities in agriculture, forestry and fisheries". The first floor will house the Geographic Soils Information Center and the Soils and Insect Museum. The smart and digital agriculture center will be on the second floor. The equipment and facilities acquired are installed in the Geographic Information Support System for high value and indigenous crops in SOCCSKSARGEN. This will be the anchor facility for the scaling up of the smart and digital technologies of all high value crops and indigenous commodities' stakeholders (agricultural extension workers, graduate students, and researchers).

Keywords:

8:20 – 8:40

S222- Upgrading of Crop Processing Center at University of Southern Mindanao

Francisco Gil N. Garcia and Harem R. Roca

ABSTRACT. The project is aimed to upgrade the USM Processing Center through the acquisition of new pieces of equipment to be used in the processing of additional products with a budget of Php 5 million and DA-BAR as funding agency. Following government protocol, a series of bidding was conducted, and a winning bidder was elected via Single Calculated and Responsive Bid (SCRB). All other requirements thereafter were issued by USM BAC to the winning bidder and in turn, the latter complied with all post-bidding requirements. Delivery of the various equipment is expected within the next 45 days from the date of contract signing.

***Keywords**:* upgrade, processing, equipment, bidding, SCRB

8:40 – 9:00

S221- Development of Handbook on Good Agricultural and Marketing Practices for Economically Important Crops in USM

Edward A. Barlaan, Marry Grace S. Balbuena, Jeannie U. Duka, Victor C. Dapon, Helen A. Macailing and Nicko Abestano

ABSTRACT. Industrial crops such as rubber and oil palm and food crops like cacao, durian, lanzones and mangosteen are agricultural crops with economic values. Although these commodities are the banner crops of University of Southern Mindanao, there are very limited updated printed materials that provide comprehensive information from pre-planting to good agricultural practices and marketing systems. The study aims to consolidate the different established good agricultural practices and marketing practices on high value crops, to develop drafts and subject the crafted drafts for assessment through experts and specialist of respective crops and to generate prototype copy for reproduction. A total of 6 handbooks on "Good agricultural and marketing practices" (GAMPs) was crafted. These handbooks were crafted to address the needs of small and medium sized orchard practitioners or farmers, as well as the students, researchers and other stakeholders. The handbooks contain the features of the different varieties of each crop, production practices and techniques which includes the agronomic and biological background of the crop, production (planting, water management, and fertilization), pest and its control, diseases and its control, harvesting and post-harvest management as well as the marketing practices, including the cost and return analysis of each crop. Final drafts, lay-out and validation was conducted and a prototype copy of the handbook was drafted.

Keywords: Good agricultural practices, handbook, high value crops, marketing practices

9:00 – 9:20

S209- 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, tableya, postharvest, processing, upgrading

9:20 – 9:40

S223- Upgrading of Tissue Cultures Facility in University of Southern Mindanao

Mark Al-Jamie J. Muttulani, Harem R. Roca and Sheena B. Lucena

ABSTRACT. Tissue culture is an important technology for the production of 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. In addition, plant tissue culture is used widely in plant science and also has a number of applications. USM has generated molecular markers that can be used for certification of pure or genuine planting materials for ensuring high production due to the use of correct high yielding varieties. However, the current facilities for tissue culture and biotechnology in USM are already antiquated and inadequate to house many new equipment. These facilities are located in one building to supplement and complement researches activities related to tissue culture and molecular researches. Besides, the current set up cannot accommodate students, researchers, and other stakeholders for training, skill development, workshop and instruction. Thus, there is a n urgent need to upgrade the facilities particular on tissue culture laboratory with several functions, these includes production of quality true-type and disease free banana seedlings, research and training center for DA-BAR funded biotechnology and molecular technology related researches for researchers and technical staff of different state universities and agencies of Department of Agriculture from various regions and other stakeholders.

Keywords: laboratory, tissue culture, quality planting materials, upgrading

9:40 – 10:00

S224- Upgrading of Cacao Post-Harvest Processing Center at University of Southern Mindanao

Harem R. Roca and Sheena B. Lucena

ABSTRACT. A project was conducted mainly to upgrade the Cacao Post-harvest Processing Center at the University of Southern Mindanao through rehabilitation of cacao post- harvest processing equipment and facilities in support of on-going and future cacao research activities. It is funded by DOST-IDD with an appropriation of Php 5,000,000.00. So far, all necessary equipment requested were already bided and awarded to the winning bidder. The rehabilitation of the building is up for bidding yet. Delivery of equipment is expected before the end of the last quarter of the year. When fully refurbished, the facility is expected to be used for production and as a shared facility for training through transfer of technology and other endeavors of the university.

Keywords: cacao, equipment, post-harvest, rehabilitation, upgrade

10:00 – 10:20

S203- Development and Evaluation of Automated System for Profiling of Student Organizations in the University of Southern Mindanao

Yvonne V. Saliling, Geraldine M. Quiñonero, Paul John B. Ongcoy and Ryan Z. Gonzaga

10:20 – 10:40

S206- Development of Rapid Technique for Analysis of Adulterated Wholesome Food Products: A combination of Spectroscopy and Chemometrics for Halal Food Analysis

Frederick John B. Navarro and Queennie L. Rufino

ABSTRACT. Chemical analysis plays an important role in establishing an effective Halal food management system in the region. Current methods include chromatographic and DNA based methods that involves hazardous chemicals, long analysis time, and complex sample procedures. Hence, this project aimed to develop a rapid technique on differentiating protein and fat sources in food and pharmaceutical products using Fourier Infrared (FTIR) Spectrophotometry in combination with chemometrics. Method development involves the identification of absorption bands of porcine and bovine gelatin/fat, optimization of FTIR setting and sampling, determination of wavenumbers in physical effects on samples, optimization of chemometric settings, and validation in real samples, The progress of the project from January to October involved the initial runs for spiked samples with gelatin and fat standards. The initial results were used for optimization of gelatin/ fat extraction. In current laboratory setting of USM, attenuated total reflectance (ATR) and direct reflectance (DR) were applicable for fat and gelatin film FTIR sampling techniques, respectively. The initial chemometrics result identified fat can be differentiated mainly with sp3 C-H stretch (2800-3000 cm-1), which was positively correlated with the C=O stretch (1700-1800 cm-1), and acyl C-O (1100-1200 cm-1). The initial analysis of chemometrics involving the calibration and cross-validation samples showed that the predictability of the normalized spectra can be improved from 90-110% to 98-100% if the calculations were selective to the identified wavenumbers, Food samples with less than 10% gelatin were difficult to analyzed using the film method compared to pharmaceutical samples with more than 80% gelatin. The project is limited with the current available supplies and materials. Last June, the FTIR light source has expired which contributed to the major challenges in continuity of the project. The pandemic continuously affects the progress of the project. Nevertheless, the project has identified topics for EIC materials for the adulteration of food and pharmaceutical products as a result from the initial market surveillance. The project also extends through possible collaboration and partnership with the regional halal laboratories.

Keywords: Fat, Gelatin, Protein, Infrared spectroscopy, Multiple linear regression

10:40 – 11:00

S208- Development, Standardization and Packaging of Nutri-foods for Emergencies

Jigzcel Divine F. Basoy, Ivy Mar B. Cabornida, Maribelle T. Piamonte, Leila S. Moscoso and Urduja G. Nacar

ABSTRACT. Nutrition is related to immunity and to the risk and severity of infections. Vulnerable groups specifically children, pregnant and lactating women, elderly, and those poorly nourished individuals are at a greater risk of various bacterial, viral, and other infections. Conversely, chronic or severe infections lead to nutritional disorders or worsen the nutritional status of affected people. Nutritionally dense food products must be made and must be introduced to consumers to give them options for healthy food choices especially during emergencies. The study aimed to develop, formulate and standardize nutritious foods for emergencies. These nutri-foods are made of underutilized and lowly ingredients that are available locally. The main ingredients used in the study were: coconut residue/"sapal" for the nutri-bar; vegetable and fruits leaves and flowers for nutri-juice and modified local delicacies made of rice and corn were adapted and vacuum-packed for cereal-based nutri-foods The study was able to formulate 3 types food products, namely: 1) nutri-bar, 2)nutri-juice, and 3) cereal-based nutri-foods. For the nutri-bars, the treatments were "sapal" with mixed raisins and nuts (T1), with mixed raisins and nuts + dried mango (T2) and with mixed raisins and nuts + dried pineapple (T3); Treatment 3 gained a like very much general acceptability. For nutri-juice, 6 commodities were explored: (Treatment 1), Ulasimang bato (Treatment 2), talinum (Treatment 3), cassava tops (Treatment 4), blue ternate flowers (Treatment 5) and aratiles tops (Treatment 6). Out of the 6 juices, Treatment 4 gained like very much acceptability. For the cereal-based nutri-food, "patil", (a dish meal providing the concept of having rice as staple added with sautéed chicken flakes) the treatment which was vacuum-packed for 3 days was rated with like moderately, while those vacuum-packed 2 days and 1 day were just rated like slightly. Nutritive value and proximate analyses were still on-going, along with the study on shelf-life. Other formulated cereal-based food products were "biko", a composite of malagkit corn and malagkit rice and suman "rimo" (combination of rice and monggo). These were still currently standardized for sensory evaluation, proximate analyses and calculation of production cost.

Keywords: development, standardization, packaging nutri-foods, emergencies

11:00 – 11:20

S225- Effective Rubber-Based Cropping Systems in North Cotabato

Adeflor G. Garcia

ABSTRACT. The project on "Effective Rubber-Based Cropping Systems in North Cotabato" was established in December 2019 at the University of Southern Mindanao Agricultural Research and Development Center, Kabacan, North Cotabato. The main crop is rubber planted on double hedgerows (2.75 m x 4.5 x 16 m). The mainplots represents the perennial intercropping system: Rubber + cacao, rubber + coffee, rubber + banana-cardava; and rubber + lanzones. The annual intercrops represents the subplot: corn, mungbean, cassava and eggplant. The

rubber maincrop attained the recommended height for branch induction after 10 – 12 months after field planting. Among the perennial intercrops, banana-cardava started to be productive after 12 months. Harvesting started in March 2021. Coffee has started flowering, while cacao and lanzones are growing well. There were three crop cycles of corn and mungbean intercrop planted on year 1 (2020) for all the rubber perennial mainplots. Cassava and eggplant annual intercrops has one crop cycle for the year 2020. The grain yield of USM Var 10 , green corn yield of sweet and glutinous corn were all comparable among the different perennial intercropping models. The mungbean yield for three crop cycles were also comparable among the perennial intercrops. The tuber yield of cassava and the eggplant yield did not differ significantly among the perennial intercropping models. Further, the yield levels of the annual intercrops were higher than the national average of corn, mungbean , cassava and eggplant. The annual intercropping models are now under field evaluation for the year two (2) performance under the four rubber based cropping models.

Keywords:

11:20 – 11:40

S226- Developing Robust Diagnostic Tools and Effective Chemical Formulation for Rubber and Companion Crops to Improve Rubber Productivity

Adeflor G. Garcia, Johnvie B. Goloran, Mel Chrisel A. Sales, Oscar J. Jurado and Argie P. Casis

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 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. There were seven studies conducted to attain the objectives and are as follows: physicochemical status of soil as affected by the age of rubber (>6-<10 and >10 to <15 years old); Influence of mucuna, inorganic fertilizer and organic fertilizer in the soil physicochemical properties, plant nutrient content, growth and yield of rubber; macronutrient uptake of rubber at early stage of growth and development; Variation in nutrient stoichiometry of insect under mixed cropping systems; Elevation index on growth and latex yield of PB 260 and RRIM 600; Litterfall and nutrient dynamics in rubber; Determination of appropriate for soil testing method for N availability and establishment of optimum N levels for rubber; and Establishment appropriate soil testing methods for extractable P. BSA students of CA-USM were involved as part of their research study. The component studies were conducted on field (North Cotabato, Bayugan, Agusan del Sur). Results on the growth, cuplump yield, soil pH and EC in the studies: 1) physicochemical status of soil as affected by the age of rubber (>6-<10 and >10 to <15 years old); and 2) influence of mucuna, inorganic fertilizer and organic fertilizer in the soil physicochemical properties, plant nutrient content, growth and yield of rubber was presented. Under the study of physicochemical status of soil as affected by the age of rubber (>6-<10 and >10 to <15 years old), cuplump yield of rubber under the 7-year-old trees in USM, Kabacan, North Cotabato increases with fertilization in the month of May and June. Furthermore, soil

pH increases with fertilization under the 11-year-old trees in the same study location. Overall, cuplump yield tends to increase both in 7-year-old and 11-year-old trees in Kabacan, North Cotabato and Agusan del Sur. It may take time for a perennial crop-rubber to show significant influence on the cuplump yield of rubber. Under the study: influence of mucuna, inorganic fertilizer and organic amendment in the soil physicochemical properties, the application of inorganic fertilizer (RR) decreases the soil pH both in soil with and without mucuna.

Keywords: soil nutrient, fertilization, organic amendment, cover crops, cuplump yield

11:40 – 12:00

S227- Molecular Fingerprinting of Cacao Parental Recommended HYVs and True Criollo Ensuring Multiplication of Quality Planting Materials (QPMs) for Increased Productivity and Profitability

Edward A. Barlaan, Cris Harvin Rey G. Calvo, Alvin John R. Quitel, Elcy Jane C. Naquitquitan, Kristine D. Paguntalan

ABSTRACT. Utilizing SSR markers for molecular fingerprinting of National Seed Industry Council (NSIC) Cacao recommended high yielding varieties (HYVs) is essential to ensure that quality planting materials (QPM) of genuine varieties are true-to-type with emphasis on parent or mother plants as source for clonal propagation. The study aims to identify and molecularly fingerprint parental sources of recommended cacao HYVs and true Criollo for multiplication of quality planting materials and to propagate the certified true-to-type cacao varieties as mother plant sources or genetic stocks for distribution. This is to guarantee that farmers are using the correct high yielding varieties for increased cacao production and income. Cacao nurseries accredited by the Bureau of Plant Industry – National Seed Quality Control Services (BPI-NSQCS) in cacao growing regions were contacted for collaboration of project implementation. Functional SSR markers are used to validate NSIC recommended varieties and differentiate true criollo types from non-criollo accessions. Five (5) accredited nurseries across region XII agreed in collaborating with the project. Leaf samples from different accredited nurseries were collected and stored. Claimed criollo-types leaf samples were sent thru courier from different regions of the Philippines. DNA of collected leaf samples from accredited nurseries and samples of claimed criollo-types were extracted and quantified as an initial step for further analysis. Polymerase chain reaction (PCR) amplification was done and validated SSR markers for UF18 and BR25 confirmed authenticity of NSIC released varieties. To ensure the continuous distribution of QPMs, cacao nursery has been established. As of now, around 4,000 root stocks are available for grafting. Collection of scion and grafting of seedlings from certified mother plants were witnessed and assessed by BPI-NSQCS 12. Grafted seedlings are ready for distribution to collaborating accredited cacao nurseries.

Keywords: Cacao, Criollo, Molecular Fingerprinting, High Yielding Varieties, Quality Planting Materials

1:00 – 1:20

S228- Upgrading of the Cacao Gene Bank for Conservation and Management in Cacao Varietal Improvement

Gwen Iris D. Empleo, Ivy M. Pasquin, Jeannie R. Binaohan, Avigel I. Cabrillos,
Engela Maricris Gaoiran, Ryan C. Eder

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 cacao gene bank in USM, enhance the cacao gene bank in USM through the introduction of additional cacao breeding stock, evaluate the morphological and agronomic characteristics of the cacao breeding stock 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 23 accessions/trees from the Davao region were collected and grafted at the nursery. A total of eleven cacao varieties/clones were used as parents in 19 cross combinations. Additional cacao accessions from local and international sources will be collected and added to the gene bank. Morphological evaluation of the existing cacao clones is ongoing and additional crosses will be generated.

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

1:20 – 1:40

S229- Development of Optimized Post-Harvest processing Approaches for Improved Quality of Cacao Beans

Renel M. Alucilja, Maricel G. Dayaday, Sheena B. Lucena and Lydia C. Pascual

ABSTRACT. Cacao bean quality significantly influences quality of cacao-based and products market price. 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 a semi-automated cacao fermenting bin lessens labor through its mechanism. It is a self-mixing bin with the addition of automation to maintain the temperature inside the fermenting box and a monitoring system that allows the operator to determine the status of the fermented bean during the process. Benchmarking survey for the drying, fermentation, pod storage, and bean storage was done in different municipalities of Region XI and XII to determine the common practices to serve as control for innovation and optimization. Physico-chemical analysis determined the ash content, carbohydrates, crude fat,

crude fiber, crude protein, moisture, pH, theobromine and titratable acidity of processed cacao beans.

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

1:40 – 2:00

S232- Smart Soil and Nutrient Management using Sensor Technologies to Increase Productivity of High Value Crops at the University of Southern Mindanao

Adeflor G. Garcia, Sheena B. Lucena, Jessie G. Elarde and Carlo D. Bacus

ABSTRACT. This is a component study of the project entitled "Harnessing Smart and Digital Agriculture Technologies of High Value Crops at University of Southern Mindanao" funded by the Dept of Agriculture Bureau of Agricultural Research from January - December 2021. The objectives are: 1) to develop a smart soil and nutrient management system for high value crops using sensor technologies; 2) to pilot new multi-sensor techniques for optimizing fertilizers to increase production of cacao, coffee, lanzones, pummelo, banana cardava and rubber. The six (6) experimental sites has been identified and prepared located at University of Southern Mindanao Agricultural Research & Development Center. Another site identified is at the DA Sateliite Station at Balindog, Kidapawan City still in North Cotabato. The multisensors are still at the procurement stage. The farm lay-out will be the same with the drip irrigation system.

Keywords: smart agriculture, sensor technologies, smart nutrient

10:00 – 10:20

S302- USM-CA Extension Services: Agrikonek gamit ang SocMed

Josephine R. Migalbin, Julius Jerome G. Ele and Tamie C. Solpot

ABSTRACT. Extension is one of the four-fold functions of the College of Agriculture, University of Southern Mindanao (CA-USM). As a college, the CA is active in the dissemination of technologies to farmers and other stakeholders of the University. Amidst the covid-19 pandemic, restrictions on face-to-face engagements have limited the college in providing extension services among its clientele. Therefore, this project was conceptualized to give support to the interested learners in fisheries and agriculture through the delivery of extension services via webinar using digital platforms primarily through Facebook (CA Facebook page). In the past eight months (October 2020-October 2021), the College of Agriculture has delivered 11 webinars in various topics in the field of plant pathology, horticulture, Plant Breeding and Genetics, and Animal Science. Eight of the speakers were faculty members of the college, and three were invited from other institutions. After each webinar, resource speakers are evaluated by the online participants, and e-certificates were given to those who successfully participated the webinar.

Keywords: agriculture, digital platform, Facebook, online, webinar

10:20 – 10:40

S304- Integrated Video and Audio Learning Services for Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2020)

Janice M. Bangoy, Ardniel A. Baladjay, Genghis Khan P. Manero, Allan Dalo, Jovelyn S. Gesulga and Myrna R. Tan

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. In partnership with CAS, the project team trained 320 faculty and full-time researchers on IEC print materials development and reactivated the Extension Services Office Facebook page. The project team also produced twelve episodes of School-on-Air on Halal Goat Production, dubbed as "Teknogiya sa Radyo," on radio, live-streamed on Facebook, and uploaded on YouTube. The cacao production module developed is utilized by the ISEE project 2021 school-on-air. Two YouTube videos were also successfully uploaded via YouTube in partnership with the USM Multimedia Team and 4 IEC print materials on Halal Goat production. The project is still in the process of collecting data based on Bennett's Hierarchy Evaluation.

Keywords:

10:40 –11:00

S310- Sustainable Human Development and Resiliency (SHuDaR) Framework for the COVID-19 Pandemic-Affected Communities in North Cotabato Province

Ma. Dely P. Esberto, Joel V. Misanes, Samson C. Rapuza, and Manuel J. Tayong

ABSTRACT. The project intends to deliver technical services that can strengthen the community's capacity to sustain their welfare through building a resiliency framework to cope with the COVID 19 pandemic devastation. Specifically, it aims to empower the breadwinner of the family, provide livelihood options to augment their income, formulate policies and contingency plans on eco and biodiversity conservation and management to be institutionalized in their local government unit and capacitate the LGU and bgy officials to operate equipment for the solid waste management. The CTI program is composed of three project components namely: community organizing and project monitoring; capacity building and livelihood; and ecosystem and biodiversity protection and management. The first project component covers the main activities on social preparation and community organizing, impact assessment and evaluation and mid-term planning. The second one is intended to provide capacity building and knowledge management and livelihood project. The third component

includes interventions on solid waste management and biodiversity conservation. Most activities were implemented on the 3rd quarter of 2021. The main highlights of project implementation include the formulation of Workplan, MOA signing, conduct of TNA, Baseline Survey, SWOT Analysis, conduct of two skills training, symposium on Solid Waste Management, techno demo on shredder machine, and distribution of carpentry hand tools for their livelihood.

Keywords: Skills training, Carpentry, Driving, Basic Troubleshooting, livelihood

11:00 –11:20

S312- Curriculum Development and Offering on Halal Science and Scholarships for SUC Faculty on Halal Science

Josephine R. Migalbin, Ruby Hechanova, Luzviminda T. Simborio and Jurhamid C. Imlan

ABSTRACT. The project entitled "Curriculum Development and Offering on Halal Science and Scholarships for SUC Faculty on Halal Science" sought to promote the passage of Philippine Halal Export Development and Promotion Act of 2016 which necessitates that human resources be capacitated to ensure that consumers and users of halal products, process and services are protected. On the same vein, Garcia (2016) stated that "as the country aggressively initiates its plan to develop its Halal industry, a parallel effort should also be provided to HEIs to be integrated in the Halal value chain. The objective in general is to develop a curriculum on Halal Science for human capacity building of halal stakeholders with specific objectives such as to develop and implement a Certificate Course in Halal, train SUC faculty on Halal Science and develop a mechanism to sustain the program are sought after, especially by USM being the lead agency of the project. The methods include benchmarking of courses from established institutions abroad, review of courses to suit the need of Philippines, consultation with stakeholders, curriculum and module development, finalization and course offering. The problems they encountered, as well as the solutions they recommended, were also looked into. Moreover, the Certificate Course in Halal Science is ongoing as pilot course offered by USM and the outcome of this project shall be utilized as basis for enhancement and intensified promotion of Halal Science in higher education.

Keywords: RA 10817, Halal Science, higher education institution, curriculum development, scholarships

1:00 –1:20

S313- Market Analysis and Positioning of Processed Halal Chevon Food Products

Jalaloden B. Marohom, Ivy Mar B. Cabornida and Crystal Jhane A. Garate

ABSTRACT. Halal has been given attention due to consumer's concern on food safety, health, ethical concerns, among others. Chevon, a meat from goat, is an important source of protein. However, there are no Halal chevon products like corned, jerky and sweet cured that are commercially produced. Hence, the study aimed to develop positioning strategies to

commercialize the three processed products. A survey was undertaken to 400 respondents from selected municipalities and cities in the Philippines consisting of households, students, and travelers. Data elicited were analyzed descriptively. Spearman rank correlation and regression were also used to further the analysis. Majority of target market were willing to buy the products and their preferred label designs and trademark were registered. Based on Porcine DNA Detection result, products are negative of any pork derivatives. The result of microbial shelf-life testing also showed that products stored in constant 7 degrees freezer temperature lessen bacterial contamination until eliminated. Results showed that respondents are willing to spend less than an hour per week in buying and willing to pay up to PhP399.00. Of which, the former is significantly affected by both monthly income and educational attainment while only monthly income significantly affects the latter. Specific to Halal chevon, findings revealed that price and packaging are negatively related to frequency of buying jerky while packaging is negatively related to frequency of buying sweet cured. The price, brand, label, packaging, and availability are negatively related to frequency of buying corned chevon. Results revealed further that willingness to pay is positively related to frequency of buying products and highly significant towards estimated spending. Products were also rated as appealing, pleasant, tender, and tasty. Therefore, for products to be commercialized and positioned, proper packaging should be observed with clear and informative labels, has a Halal logo, easy to locate, and are tasty.

Keywords: Commercialization, Halal Chevon, Porcine DNA, Positioning Strategies, Shelf-life

1:20 –1:40

S315- Development and utilization of learning materials for community animal health workers

Elizabeth C. Molina, Lilian A. Lumbao, and AP Warren P. Adamat

ABSTRACT. Livestock production constitutes an important component of agricultural economy but due to some constraints such as the unavailability of veterinarians or animal technicians in rural areas, the location where animals were raised and at the present time, the existence of Covid-19 pandemic that causes movement restriction, animal health had been compromised. The development of community animal health workers (CAHWs) is a good intervention to address the situation. The aim of the study is to develop and utilize learning materials in the form of video clips for CAHWs to be equipped with the basic veterinary procedures which is an integral element in engaging animal-related activities and to evaluate usefulness of the said material in the development of CAHWs.

Keywords: agricultural economy, animal technician, livestock production, veterinary procedure

1:40 –2:00

S321- Tablea: Pangkabuhayan Para sa Kotabateňong Pamayanan: Community-Based Tablea Production for Sustainable Livelihood in Cotabato

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

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. Cacao production in Region 12 is projected to increase which provides opportunities for sustainable livelihood to Cotabateños. This project aims 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 and packaging, and product 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: Antipas Cacao Growers Association (ACGA), Aleosan Cacao Farmers Association (ACFA), and Tulunan Cacao Growers Association (TCGA). The respective association leaders facilitated the selection of ten members who will undergo the training while the USM Tablea Team carries out the development of six training modules for various project activities and drafting of memorandum of agreement (MOA) for forging partnership between USM and organized cacao associations. Meanwhile, the Project Team was able to conduct one training with ACFA officers and members on pre and post-harvest practices and tablea production. Catch-up plan on capacity building through training was formulated to meet the expected outputs of the project.

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

2:00 –2:20

S323- USM-CA Ugnayan sa Magsasakang Moro at Katutubo

Josephine R. Migalbin, Tamie C. Solpot, Basser L. Mamalac, Geoffray R. Atok, Adrniel A. Baladjay, Jurhamid C. Imlan, Samsudin A. Panday and Jalaloden B. Marohom

ABSTRACT. The College of Agriculture (CA) with its extension arm has a goal of supporting marginalized farmer-sector by providing technical advisories in agriculture. A collaboration between the CA-USM and the NGO Islamic Relief Worldwide (IRW) was conceptualized to fulfill common goal. This project aims to support local farmers in four barangays of Datu Saudi Ampatuan, and Datu Odin Sinsuat, Maguindanao by giving technical trainings on crop and animal production systems to Maguindanaon and T'duray farmer-leaders. Prior to interventions, Rapid Rural Appraisal (RRA) was conducted by the IRW using structured questionnaire and data validation through focus group discussion (FGD). Major commodities

cultivated in the area are rice, corn, and vegetables. Major constraints identified includes the occurrence of pests and diseases, lack of knowledge on crop management practices, resulting to low productivity. Some farmers also engaged in goat, chicken, and duck production with disease problems identified as the main constraint and the lack of technical know-how on animal management practices. To address those challenges, 40 farmer-leaders were trained on crop and animal production and management in USM. It was followed by an on-site training involving actual demonstrations on vermiculture and organic concoction making. Moreover, actual advisories on farming practices were made on corn, rice, poultry, and goat raising in the area. With these trained farmer leaders, peer to peer training was also conducted to empower neighbor farmers in the locality. Capacitation of women's group on livelihood project such as dishwashing liquid, fabric conditioner, and powder detergent soap making; as well as duck raising, and egg production was also done for an added livelihood source. Beneficiaries were also trained for product branding, design, and marketing strategies for the existing local enterprise in the service area. An establishment of an on-site demo farms was also done showcasing vegetable, rice, corn, and animal production serving as model farms in the locality.

Keywords: agriculture, collaboration, extension services, Maguindanao, training of trainors

2:20 –2:40

S325- CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful Action) Amidst Covid-19

Sedra A. Murray, Marivic Candari, Bejian Arellano and Roel Valenton

Keywords:

2:40 –3:00

S326- "Ubing nga naalibtak": Fostering social resilience among grade school learners through moral and law-based education

Ivy S. Millare, Roselyn M. Clemen and Maricar U. Juaneza

ABSTRACT. Children are not exempted from experiencing anxiety and depression because of the difficult events that they experience in life. Evidence continues to accumulate on the short- and long-term risks to health and well-being posed by adverse life experiences in children, particularly when adversities are prolonged, cumulative, or occurring during sensitive periods in early neurobiological development (Traub & Boynton-Jarrett, 2017; Black, et. al, 2017). At the same time, there is increased concern about disasters, conflict, poverty, pandemics, climate change, and accompanying displacement having an impact on children's global well-being (Masten, 2014). These challenges become toxic stressors without proper moral, social, and practical education, and can eventually cause irreparable damage to a child. Fostering resilience and adaptive development in a child's intellectual, emotional, behavioral, and physical adjustment is a critical responsibility since it is how people overcome obstacles and deal with challenging situations. According to a study, children who are more resilient are best prepared to cope with stress, which is a normal response to tragedy. Resilience in the context

of working with primary school-aged children is defined as good interpersonal skills, high self-esteem, a positive outlook on the future, excellent interpersonal skills, and the ability to express and control emotions (Lantieri, 2008; Windle & Benne, 2008). This research explores the methods that can assist grade school students in developing the skills associated with resilience, such as developing a child's spirituality by (a)demonstrating God's love in tangible way and to share the good news of salvation, (b) introducing lessons about God, (c) guiding and nurturing the children on their spiritual journey; empowering children on their rights by (a)identifying learners rights and obligation, (b). empowering children of their rights; and lastly developing life skills by (a) familiarizing the learners to basic practical skills through household chores, (b). developing skills in managing money and resources, (c). strengthening emotional skills in facing stressful situations (d) enhancing skills in artistic expression. Furthermore, this study will be conducted with the grade school learners of Purok Kapayapaan, Brgy. Poblacion, Kabacan North Cotabato which will be focused on fostering their social resilience to improve their holistic development as well as obtain skills and perspectives that allow them to overcome significant challenges and adversity in their lives to able to adapt to circumstances and are more likely to succeed in school and beyond constructively and healthily.

Keywords: Social Resilience , Grade School Learners, Moral, Law based education, Skills

3:00 –3:20

S314- USM Wildlife Rescue and Research Center (USM-WRRC) as Agri-tourism Destination

Florence Roy P. Salvaña

ABSTRACT. The University of Southern Mindanao Wildlife Rescue and Research Center (USM-WRRC) is a facility which houses certain wildlife species that were rescued from communities. It serves as temporary or permanent sanctuary depending on the wildlife status. Wildlife rescued and rehabilitated will be categorized and observed for re-introduction as part of the re-populating process of the wildlife niche and translocation. This study aims to conduct rehabilitation and campaign programs through various platforms, establish IGP through wildlife ecotourism and an area for instructional purposes. Notable results include (1) development of brochures and website for USM WRRC; (2) development of guidelines for tours and visits for IGP; and (3) development of guidelines for the conduct of instructional activities. USM WRRC is a facility not only for wildlife conservation and management but also for ecotourism. It is recommended to develop additional sustainable plans for the center's operations.

Keywords: wildlife, ecotourism, conservation, income generating project, instructional purposes

3:20 –3:40

S332- DOST- PCAARRD and University of Southern Mindanao Agri- Aqua Technology Business Incubator

Pia Amabelle M. Flores, Jalaloden B. Marohom, Benjie B. Mar

ABSTRACT. USM begins its first phase of implementation as one of 16 ATBI's in the country under the banner program DOST-PCAARRD which will run for 2years. The TBI centers launched in SUCs are one of the mobilizations anchored by the "Innovative Startup Act" (RA 1137) which serves to satisfy the following objectives, to: 1) capacitate USM ATBI personnel; 2) identify and establish partnership with the incubatees; 3) identify and establish linkages aming 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. As of its second year implementation, the project gathered total of 8 incubatees and 10 potential incubatees for startups through awareness seminar in the University and social media campaigns. Five (5) technologies were granted the "Fairness Opinion Report" to commercialize USM Corn OPV and hybrid corn technologies, drafted modules for TBI mentorship series, conducted 2 echo-seminars/ workshops and facilitated promotional activities through technology pitch days. The turmeric tea products of Ms. Elnora Flores were promoted in the National ATBI Week while BFLEX technology was qualified in the Top 9 finalists of Tech Planter Philippines. USM ATBI is working on its partnership with DTI in the future. The project also highlights the unveiling of the DOSTPCAARRD and USM ATBI marker at the USM DOST-PCAARRD Technology Center (DPTC) to commemorate the collaboration of two agencies to foster technology transfer through technology business incubation.

Keywords: USM ATBI, RA 1137, technology business incubation, Startup, incubate

3:40 –4:00

S333- 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

Pia Amabelle M. Flores, Cyrelle M. Besana and Abegail B. Sauyen

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 on-going project serves to satisfy the following objectives: 1) capacitate the 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 SUCs to harmonize IP management and technology transfer activities; 4) intensify linkages with various agencies to enhance activities on intellectual property protection and management and technology transfer and commercialization; and, 5) provide support to the development of the IP-TBM

Real-time monitoring system (RTMS). As of the third quarter of the project, following outputs were accomplished: facilitated 5 “Fairness Opinion Reports” to commercialize USM OPV and hybrid corn technologies, conducted 2 echo-seminars/ workshops on IP local and regional. The project consolidated IP assets including 20 filed Utility Models (UMs), 5 filed copyrights, 7 pending Trademarks, 12 registered copyrights and 4 UM registered UMs. The project also conducted Consultation Meeting for Rubber Industry Strategic S&T Plan (ISP) which participated by national industry partners, private sectors, technical experts, DOSTPCAARRD, IPOPHL and selected SUC’s. The project also highlights the re-unveiling of the IPTBM marker in the USM DOST-PCAARRD Technology Center (DPTC).

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

8:20 –8:40

S329- Gabay sa Pagkatuto: Lunsarang Angkop, Napapanahon at Sulit (GS-Plans)

Leorence C. Tandog, Debbie Marie Versoza, Florie Jane Tamon, Benedict Entera
Shandra C. Gonsang and Astrofil Hyde Alcala

ABSTRACT. As a response to the restrictive situation caused by COVID-19 pandemic, basic education has embarked on the use of modules in the delivery of lessons. Learning of modules however proved to be difficult for students who lag in basic competencies and become similarly difficult for parents who have incapacity to provide the needed mentoring to schooling children. To lighten the burden of both parents and students in self-learning, some schools and teachers initiated the preparation of supplementary materials. In this endeavor, many teachers felt the need of experts to evaluate and suggest ways to enhance the quality of developed supplementary materials. In this extension project, teachers are assisted in the development of quality supplementary materials, in the refinement of instructional materials they initiated and in providing support for professional development of teachers. Generally, this project aims to provide support to teachers to efficiently facilitate the learning of essential competencies by the students. To carry out the aims of this project, needs assessments were done to determine the supplementary materials needed by the teachers, planning on project execution was held, and brainstorming between DepEd teachers and GS extensionists were conducted that resulted to development of materials. Of the four project components, the major material outputs include Mathematics booklets that focus on the foundational concepts of fractions; comic strip designs used as illustrations in learning activity sheets of grade 3 pupils under the MTB curriculum; mobile application that contained video clips for identified Physics topics; and a working device that runs offline or without internet and allows students and teachers download, upload and store files. An offline technology tool was developed to facilitate resource sharing and access of instructional materials in the remote area. The project was also able to assist group of teachers who sought suggestions for improvement of materials they developed before reproduction and catered to the need of teachers for training in content.

Keywords: Independent learning, competencies improvement, materials development, supplementary materials, offline technology

8:40 – 9:00

S303- Integrated Video and Audio Learning Services for Enhanced Education: A connectivity resilience project amidst COVID-19 pandemic (2021)

Genghis Khan P. Manero, Janice M. Bangoy, Allan Dalo, Jasmin Pecho and Eugene Ranjo

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 launched its new radio program titled "Ugnayan Natin sa Radyo at TV" in March 2021, in addition to the Teknogiya sa Radyo at TV School-on-Air program (SOA). This program supports partner agencies in disseminating relevant information to the communities. To date, seven episodes have been aired together with partner agencies, with 66,650 viewers. The School-on-Air on Cacao Production will begin in November 2021 and will be airing weekly every Friday. The three organized beneficiaries (2 associations and one cooperative) will be from LGUs Antipas, Tulunan, and Aleosan. A cacao production printed IEC is produced, including a draft e-module on Cacao Harvest and Post-Harvest Processing. Bennett's hierarchy evaluation will be used to evaluate the School-on-Air on Cacao Production.

Keywords:

9:00 –9:20

S305- HEALS (Health, Environment, Agriculture and Livelihood Skills) for Sustainable Development 2020

Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Monaira Sumael, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva, and Joel V. Misanes

ABSTRACT. HEALS (Health, Environment, Agriculture and Livelihood Skills) for Sustainable Development was born out of the collaborative efforts of 13 extension coordinators from the different colleges of the university. The program involves the provision of holistic care to the partner community through capacity building, livelihood and entrepreneurship education, life skills and hard skills training to the agriculture, women and youth sectors in Dagupan, Kabacan, Cotabato. The program aimed to provide the beneficiaries in the partner community the chance to develop themselves as human resources equipped with the necessary skills to adapt and respond to the changing demands of time and of the world. To achieve its aim, HEALS component leaders conducted a series of Focus Group Discussions with Barangay and Youth leaders to identify the most pressing needs of the partner community and because of

restrictions on face-to-face training due to Covid-19 Pandemic. Initial results were presented back to the community for validation. The discussions highlighted the following needs identified by the partner community: (1) knowledge on poultry production, (2) processing, marketing, packaging and financial management of local products, (3) development of communication skills, (4) modular learning of learners and parents, (5) sports management, (6) development of livelihood skills, and (7) assistance on various agricultural needs of the community. By the end of 2020, most of the identified needs have been addressed. Specifically, the program has accomplished the following: 1) conduct of FGD and triangulation of results; 2) collaboration with the Extension Services Office in the provision of IEC trainings to Extension implementers among the colleges in the university; 3) conduct of 14 relevant capability building activities broken down as follows – four trainings delivered by I-LiFE, four delivered by SEEDS, four delivered by MOVER and two by DICTATE; and, 4) drafting of at least 30 Information, Education and Communication Materials subject for pre-testing in the community.

Keywords: Collaboration, livelihood, entrepreneurship education, agriculture, skills.

9:20 –9:40

S306- HEEALS (Health, Environment, Education, Agriculture and Livelihood Skills) for Sustainable Development 2021

Analyn A. Gonzales, Glyn G. Magbanua, Moreno B. Java, Jr., Faith P. Buned, Jerose L. Molina, Elizabeth C. Molina, Sedra A. Murray, Tamie C. Solpot, Jacinta T. Pueyo, Maribelle T. Piamonte, Hasim K. Iskak, April Jxeel L. Palalay, Elizabeth R. Genotiva and Joel V. Misanes

ABSTRACT. HEEALS (Health, Environment, Education, Agriculture and Livelihood Skills) for Sustainable Development was born out of the collaborative efforts of 14 extension coordinators from the different colleges in the university. The program involves the provision of holistic care in the form of capacity and capability building, livelihood and entrepreneurship education, life skills and hard skills training as well as primary health services to various sectors in Barangay Dagupan, Kabacan, Cotabato. To date, the HEEALS Project continues to address the needs identified by the partner community through "Usapang 4K: Kalusugan, Karunungan, Kalikasan at Kabuhayan", USM Radio Program at DXVL KOOL-FM 94.9 mHz every Saturday from 11:00AM to 12:00NN to conduct training-on-air to the 20 beneficiaries from Barangay Dagupan. The program aimed to provide the beneficiaries in the partner community the chance to develop themselves as human resources equipped with the necessary skills to adapt and respond to the changing demands of time and of the world. To this end, HEEALS project aims to provide the community in Dagupan a chance to develop not only economically but also holistically. To date, HEEALS was able to 1) deliver one capability building activity on organic vegetable production, 2) distribute vegetable seeds to the attendees of the training on vegetable production, 3) recorded and aired a total of fifteen (18) episodes on its Usapang 4K Radio program. The episodes were recorded by the following colleges: College of Science and Mathematics – 3; College of Veterinary Medicine – 4; and College of Health Sciences – 1; Institute of Middle East and Asian Studies – 2; College of Human Ecology and Food Sciences – 2; College of Business, Development Economics and Management – 3; College of Engineering and Information Technology – 1; and Department of Psychology - 2.

Keywords: Capability building, livelihood, entrepreneurship education, life skills training, hard skills training.

9:40 –10:00

S307- Harnessing the SMART and Digital Agriculture Technologies of High Value Crops at University of Southern Mindanao

Ardniel A. Baladjay, Janice M. Bangoy and Adeflor G. Garcia

10:00 –10:20

S308- Establishment of Urban Agriculture at University of Southern Mindanao

Joan P. Sadoral, Purficacion O. Cahatian and Adeflor G. Garcia

ABSTRACT. An urban agriculture project was established at University of Southern Mindanao (USM), Kabacan, Cotabato from July to December 2021. The project specifically aims to: a) produce oyster mushroom (*Pleurotus* sp.) as source of safe, nutritious, and affordable food for dwellers in the area and nearby localities; b) showcase mushroom production technologies utilizing organic farm waste, for potential growers and adapters; c) produce vegetables and other crops, and promote community gardening for sustainable source of food and alternative income source of people in the area; and d) exhibit novel agricultural practices for improved yield of selected vegetables. Isolation, culture purification and maintenance of the isolate were carried out. Mushroom spawns were prepared and kept inside the laboratory; while preparation of substrate (mixture of rice straw and bagasse) for fruiting bags is on-going. For community garden establishment, plots were arranged according to lay-out and plans previously prepared. Crops such as tomato, pechay and eggplant underwent pre-germination process prior planting; while lady's finger, bitter gourd, bottle gourd, pole sitaw, squash, malabar spinach, sweet potato and water spinach were directly established in the project area. Management of vegetable crops particularly weeding, watering, installation of trellis, monitoring of pests and diseases, and other practices were properly employed.

Keywords: community gardening, food security, mushroom production, sustainable agriculture

10:20 –10:40

S309- Production of Tissue-Cultured Banana (Saba/Cardava) Planting Materials

Harem R. Roca, Jane R. Desamito, Carl Jonas D. Gocotano, Analyn V. Matutis, Janine Joyce F. Develleres, Raffy James P. Balancio, Gelan Mae S. Tudlas and Esmael I. Molero, Jr.

ABSTRACT. This study was conducted to upgrade the USM Tissue Culture Laboratory with manpower, facilities and equipment for efficient propagation of 'Cardava' bananas, particularly to improve/upgrade in vitro propagation facilities and manpower at USM Tissue Culture

Laboratory, acquire state-of-the-art tissue culture laboratory equipment, mass propagate 'Cardava' banana meriplants for distribution to farmer beneficiaries in Region 12 and media formulation specific for 'Cardava' banana. A total of 783 suckers were collected and used as initial explant. The lab has produced a total of 7258 bottles of 'Cardava' banana which is equivalent to 43,548 shoots. USM must produce at least 125,000 meriplants of 'Cardava' after 1 year of implementation. Continuous propagation is being done to meet the required quota for the succeeding months.

Keywords: Tissue Culture, Meriplants, 'Cardava', culture media

10:40 –11:00

S311- Community Based Development and Economic Mainstreaming (CBDEM) on Promotion of Halal Food Products

Analyn A. Gonzales, Jul-Aida U. Enock, Metche Ann L. Logronio, Jeannie U. Duka, Mitzi Aileen M. Alba and Charisse Angela S. Quiambao

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. The college identified Barangay Kayaga as one of the areas of concern in the Municipality of Kabacan, leading to the creation of the Community-Based Development and Economic Mainstreaming (CBDEM) on promotion of Halal Food Products. Through the help of the CBDEM extension project of USM, the Maguindanaon population in the Barangay Kayaga will produce products out of their available resources. The beneficiaries can produce Halal meat products and processed products suitable for their consumption which ensures the features and quality of the products according to the rules established by the Islamic Council. The college believes that it has the economic advantage that will help both Maguindanaon and non- Maguindanaon entrepreneurs, investors, and advocates. The five departments in the college will be an instrument to the growth of Halal food industry. The college conducted a total of four (4) trainings to the twenty beneficiaries from Kayaga Women's Group. The Department of Development Management conducted two (2) trainings entitled, Project Identification and Action Plan, and Leadership Training and Teambuilding; Financial Literacy for the Department of Accountancy and Enterprise Planning and Budgeting for the Department of Agricultural Economics. The training and workshops conducted will serve as preparatory activities for the conduct of Product Development, Processing, Pricing and Marketing of Halal Kagikit Food Product to be spearheaded by the two departments of the college, the Department of AgriBusiness and Business Administration.

Keywords: Collaboration, promotion, development, economic, management

11:00 – 11:20

S301- Implementation of Upgraded Consultancy Services and Technical Assistance for MSMEs through Consultancy for Agricultural Productivity Enhancement (CAPE) Program

Ardniel A. Baladjay, Edward A. Barlaan, Mary Joy S. Cañolas and Janice M. Bangoy

Keywords:

11:20 –11:40

S322- SOXAARRDEC: Kaagapay ng magsasaka sa Krisis at Kalamidad

Elizabet C. Molina, Ardniel A. Baladjay, Siony Brunio and Analyn Derequito

ABSTRACT. In response to the Bayanihan to Heal as One Act, PCAARRD launched GALING-PCAARRD (Good Agri-Aqua Livelihood Initiatives Towards National Goals) Kontra Covid-19 in response to the government's efforts against Covid-19 pandemic. Pagkain at Kabuhayan sa Pamayanan which supports various food production and livelihood projects such as Gulayan sa Pamayanan, Tilapia para sa Pamayanan, and Manok at Itlog para sa Pamayanan is one component of the program. As a response, SOXAARRDEC initiated the project SOXAARRDEC: Kaagapay ng Magsasaka sa Krisis at Kalamidad) as an initiative under the Gulayan sa Pamayanan. It aimed to establish initiatives in selected rural communities in SOCCSKSARGEN to increase household food security and resiliency during times of calamities and disasters. The project benefited 180 households thru vegetable production (eggplant, tomato, "sinigang" pepper, pechay, and sitao). From an average of 50 sq. m. production area allocated per farmer, a positive net income was obtained by each farmer. Ten glutinous corn gardens were established which also provided either income or food for the beneficiaries. The community-based vegetable nursery produced vegetable seedlings which were distributed to 40 farmers. This facility is continuously producing seedlings for distribution. Five vermicomposting facilities were established

Keywords:

11:40 –12:00

S324- CED Cares (Community Assistance thru Research and Extension Services): Development and Utilization of Flexible Teaching Guides in Science

Ellen Joy M. Farala, Bailyn M. Mantawil and Faith P. Buned

ABSTRACT. The project CED CARES (Community Assistance thru Research and Extension Services): Development and Utilization of Flexible Teaching Guides in Science was proposed to deliver the results of a research conducted by the College of Education faculty members on the developed and validated flexible teaching guides in Science for secondary and elementary teachers. The project aimed to provide training-workshop for newly hired teachers on the

utilization and development of flexible teaching guides using lesson study method and 7E's approach for Earth Science and elementary science in the basic education level to help them cope with the demands of the challenging time brought about by pandemic wherein the delivery of instruction must continue using different modalities and deliveries of learning and improve on their teaching pedagogy to become more effective teachers as well as for their professional development. The target beneficiaries were the sixty (60) teachers coming from both elementary and secondary levels. The training was conducted virtually and lasted for 3 days were participants were able to produce lesson guides in Meteorology, Geology, Astronomy and Oceanography for use in the teaching of science.

Keywords: lesson study, 7E's, flexible teaching guides, Science, lesson study method

1:00 –1:20

S335- University of Southern Mindanao Futures Thinking for Food Security, Systems, Innovations and Sustainability

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

ABSTRACT. Futures thinking is a future-oriented mindset through a systematic method of exploring alternative futures. There is a great need to create futures for agricultural developments, innovations and systems to ensure sustainable production, profitability and food security. The program aimed to provide directions through capacity building for futures thinking for food security, systems, and innovations to leaders, faculty and researchers in University of Southern Mindanao (USM) and collaborating HEIs and agencies; to develop R&D futures for banner commodities in USM; and to identify and implement strategies for food production and innovation to address food security amidst pandemic crisis. With the assistance of the Philippine Futures Thinking Society (PhilFutures), futures capacity-building workshops and futures research and development were curated in USM. Futures capacity-building workshops were conducted, such as Futures Thinking Master Class, which was attended by different institutions and agencies in Mindanao, and USM-based Scenario and Strategy Development and Moonshot Thinking Innovation Lab. The workshops provided outputs, which highlighted the contributions of the USM faculty researchers in the development of Futures research in agri-based initiatives for food production and innovation. Four groups were identified for futures thinking-related projects and activities such as cereals, high-value crops, Halal and protein sources. Brainstorming and crafting of programs/projects were conducted by each group for futures thinking-related research proposals on emerging or innovative technologies for external funding. Likewise, project proposals were developed to address food security amidst the pandemic crisis. The proposals are currently waiting for implementation. These projects are USM's stepping stones into embarking and pioneering futures thinking for food security, systems, innovations and sustainability.

Keywords: development, foresight, food systems, innovations, research

1:20 –1:40

S327- Teacher Nanay: Mothers Today, Teachers Tomorrow

Glyn G. Magbanua, Shandra Gonsang, Erwin Mallo, Jerose Molina, Sofia Loren Neyra, Maricar Juaneza, Mariz Balquin and Vicente Delos Reyes

ABSTRACT. The Extension Project Teacher Nanay: Mothers Today, Teachers Tomorrow was conceptualized to provide needed services to a small number of mothers in the Igorot Community in Cuyapon, in ways that would help them educate their children at home, keep their and their children's mental health in check, and generate income at this time of the pandemic. Built on the understanding that extension services are primarily responsive to the needs of the community, the project underwent several stages of consultation and need analysis. The identified needs were classified as Education, Health and Livelihood. To date, the project continues to conduct capability building activities among the mother beneficiaries in the partner community. Content analysis and development of instructional materials to address the identified need on education is likewise underway. Finally, mental health session and capability building as well as a medical mission have also been scheduled.

Keywords: education, livelihood, indigenous peoples, community resiliency, culture

1:40 –2:00

S328- English Language Intensive Training for Excellence (ELITE)

Ronel A. Naringahon, Marlyn A. Resurreccion, Lloyd Anton Von M. Colita, Ana Marie B. Uyangurin, and Edna Luz T. De Guzman

ABSTRACT. This literacy training by the Department of English Language and Literature (DELL) entitled *English Language Intensive Training for Excellence (ELITE)* intends to advance the research and journalism skills of teachers in Datu Mantawil Memorial Elementary School (DMMES). DMMES is situated in Brgy. Salapungan, Kabacan, Cotabato. With the vision of the Department of Education to enhance the research and journalism skills of teachers in DMMES, DELL, through ELITE, aims to holistically improve the mastery of the nine (9) teachers in action research and journalism to maximize the teachers' full potential. During the initial stages of ELITE, the Department accomplished an in-depth analysis of students, teachers, stakeholders, and the administration profile. Specifically, need's analysis, environmental scanning, and inception were accomplished by the researcher. Thus, ELITE intends to make the following four (4) workshops: action research, journalism, and technical writing workshop. Each program has the following phases: post-test, training, culminating activity, and output evaluation. To comply with the health protocols due to the current pandemic, the teachers of DMMES and DELL agreed to online mentoring through GMeet and limited face-to-face training sessions. Currently, the Department Coordinated with BLGU Salapungan. The Baranggay expressed concern in allocating the budget for ELITE. Thus, a linkage has been established in the target community. Also, DELL distributed to school and reading materials to DMMES. The teachers received the program positively, considering that they integrated the mentoring services of DELL into their work schedule.

2:00 –2:20

S331- Enhancement of Enterprise, Marketing and Financial Practices Among Registered Tricycab Drivers and Owners (TDO) Of Kabacan

Analyn A. Gonzales, Jalaloden B. Marohom, Mitzi Aileen M. Alba, Nerissa G. Dela Vina and Cheryl L. Dulay

ABSTRACT. The members of Tricycab Drivers and Owners of Kabacan (TDO-KABACAN) was organized with the purpose of uniting all the drivers and operators who are used to transport commuters to their respective destinations. This organization was decided to be registered in the Department of Labor and Employment with the purpose of protecting, enhancing and defending the interest of its members for their mutual aid and protection, the following objectives were identified: (1) to uplift the living condition and life of its members; (2) to design and undertake activities for the benefit and welfare of its members and the organization, including projects not contrary to laws; (3) to coordinate and collaborate with proper government agencies and other rural workers organization for certain lawful undertaking; and (4) to engage in any economic or entrepreneurial venture for the benefit of the organization. Apparently, the members experienced various concerns and problems such as oil price increase, renewal of their franchises, licenses and registrations, maintenance of their units and significant others. In order to provide the stated concerns and problems, there were times that they could jeopardize the basic needs of their families. Likewise, drivers' insufficient income to sustain the basic needs of their family. Especially this COVID 19 pandemic, their primary source of living was extremely affected. With this, the organization with 20 tricycab members' desires to provide another source of living that could help uplift the lives of its active members through a Sari-Sari Store project aside from having existing Token Car wash businesses funded by the Department of Labor and Employment (DOLE). This EMarFin project of the Business Administration Department will provide an opportunity to generate additional income for the Tricycle Drivers in Kabacan by capacitating them with Enterprise Marketing and Financial Practices. Thus, it would help the beneficiaries to improve their economic conditions.

Keywords: Capacitate, Marketing, Enterprise, Financial, Economic

2:20 –2:20

S336- Capability Building of Rubber Stakeholders and Role of Women and their Children in Natural Rubber industry in Agusan del Sur

Mary Rodelyn Cariaga and Razel O. Montemor

ABSTRACT. This project is part of 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) with a duration of three (3) years, June 2019- May 2022. This effort 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. Based on the initial findings from the baseline data, the following training needs where identified by the smallhold rubber farmers in Agusan del Sur: (1) Rubber Production and Tapping Techniques; (2) Pest & Diseases Identification and Management and (3) Training on how Improve Soil health in relation to Rubber Fertilization Management. Different municipalities were recipient of the trainings which were participated in by both men and women rubber farmers. To date, trainings are still on going based on the identified schedule provided IATF rules were strictly being followed.Review of Related Literature

Keywords:

9:00 –9:20

S421- Students' Academic Performance Using Online Synchronous and Asynchronous Teaching Modalities

Saima M. Andil, Jikiri M. Entol, Remedios C. Kulidtod, Abdulnasser G. Makalugi, Norjaida D. Maliga and Sofia G. Molao

ABSTRACT. The COVID-19 pandemic has shifted the delivery of instruction from actual face-to-face to diverse online learning platforms. The online learning is currently applied by the faculty of the University of Southern Mindanao. The faculty from the Institute of Middle East and Asian Studies have applied the asynchronous and synchronous modalities. However, its effectiveness is still a subject for experimentation. The overall objective of this study was to determine any significant difference between the results of teaching platforms. The selected IMEAS students served as the respondents. The mean scores obtained from the conducted pre-test and post-test using asynchronous and synchronous delivery of instruction were gathered and compared. The six (6) faculty handling different courses had applied both modalities in their own respective students. Results revealed that most students performed better on synchronous modality. The gain scores of students under the subjects World Geography, Halal Food Processing I and History of Muslims in the Philippines were higher when they were given the synchronous teaching modality. The Research Method in International Relations, Halal Medicine and Health and Seminar 2: Global Politics and International Security could be effectively taught using any of the teaching modalities. Data generated from this study showed that there are subjects recommended for synchronous modality which could result to better performance of the students.

Keywords: Asynchronous, synchronous, pretest, post-test, modalities, delivery of instruction.

9:20 –9:40

S425- My Parents, My Teachers: Continuing Education Amidst Covid-19 Pandemic

Marcos F. Monderin, Vicente Delos Reyes, Mirasol O. Verona, Khristine Joy Garcia, Rosemarie Sison and Roselyn Clemen

9:40 –10:00

S426- Educational Innovations in Rural and Remote Communities: A Multi-dimensional Approach

Leorence C. Tandog, Debbie Marie Verzosa, Bonifacio Solsoloy, Joy Gloria Sabutan, Astrofil Hyde Alcala, Shandra Gonsang, Benedict Entera

ABSTRACT. Rural and remote communities face multiple barriers to education and educational opportunities and often occupy the margins in educational research. This project initiated a multi-dimensional approach to respond to the challenges of students and teachers from these communities emerging from the urgent educational changes driven by the Covid-19 pandemic. Results from phenomenological study and needs assessment survey reveal independent learning through modules, unavailability of supplementary materials to facilitate/augment learning, connectivity, and resource distribution and access as the main educational challenges during the pandemic. The project addressed these challenges with the introduction of technology and teaching innovations that cater to the broad range of needs of students. The field test for the developed offline technology Pinoy Pi proved the efficiency of the tool in providing solutions to issues regarding material resource sharing, delivery, and access deriving from educational adaptations during the Covid-19 pandemic. The device also served as delivery platform for the teaching innovations developed in this project. The teaching innovations used various instructional media and technological tools that utilized interactive elements and manipulable representations. Results from field observations and experimental study reveal a significant contribution of the teaching interventions on students' independent learning of essential skills in mathematics, language, and science.

Keywords: technology innovation, teaching innovation, representational approaches, educational challenges, independent learning

10:00 –10:20

S428- MATYA TANU (Magbasa Tayo)

Shandra C. Gonsang, R. Sison, ML Calibayan, W. Aquino ,N. Du, FM Reyes, N. Pabinal, R.Sugadol and B. Wali

ABSTRACT. Ang pagbasa ay isa sa mga mahahalagang makrong kasanayang pangwika na dapat na malinang sa mga batang mag-aaral. Nakasasalay sa husay nila sa pagbasa ang pag-unawa sa mga konsepto at impormasyong kailangan nilang matutunan sa loob at labas ng paaralan. Naging malaking suliranin ng DepEd ang ulat na marami pa ring bilang ng mga kabataang nasa loob ng paaralan ang di nakakabasa ng mga tekstong Filipino. Kabilang sa mga paaralan na nakitaan ng mababang antas ng kasanayan sa pagbasa ay ang Datu Mantawil Elementary school sa barangay Salapungan Kabacan, Cotabato kaya nilayon ng Kagawaran ng Wika at Panitikang Filipino ng CASS na gumawa ng programang pang ekstensyon para matulungan ang mga guro ng nasabing paaralan na maiangat ang antas ng kasanayan ng mga mag-aaral sa pagbasa.

Keywords: Pagbasa, Kasanayan, Antas, Maiangat, Filipino

10:20 –10:40

S434- Coffee Table Book: Dokumentasyon ng mga Mahahalagang Bagay at Tagpo sa Buhay ni Bai Hadja Fatima Matabay N. Plang -MIT-USM Founder)

Shadra C. Gonsang, Meriam M. Rubio and Radji A. Macatabon

ABSTRACT. Pangkalahatang layunin ng proyektong ito ang dokumentasyon ng/sa mga mahahalagang tagpo at pangyayari sa buhay ni Bai Hadja Matabay N. Plang, ang nagtatag ng ating pamantasan. Tiyak na layunin nito ang makolekta ang mga lumang larawan ni Bai Hadja Fatima Matabay Plang mula sa mga kaanak at kaibigan; Mailarawan ang mga kaganapan sa likod ng mga nakolektang larawan sa buhay ni Bai Hadja Fatima Matabay N. Plang. at makabuo ng isang "coffee table book" na naglalaman at naglalarawan ng buhay ng founder o tagapagtatag. Kwalitatibo ang disenyong ginamit, dulog historikal naman ang paraan na sinunod sa pangangalap ng mga datos at deskriptib-analitik sa pagsusuri ng mga datos.Kinolekta at tinipon ang mga larawan mula sa mga kaanak ng founder. Inayos ang lahat ng mga nakuhang larawan. Isa-isang ipinrint ang mga larawan sa bond paper. Inumpisahan ang paglalagay ng maiikling deskripsyon. Sa kasalukuyan, dahil sa mga travel restrictions, inieskedyul pa ang pagbabalik sa mga pinanggalingan ng mga larawan para sa balidasyon at pagwawasto ng ginawang deskripsyon. Naging malaking suliranin ng mga mananaliksik ang kawalan ng pondo at pagtutugma ng mga iskedyul ng bawat isa sa proseso ng pagbuo ng proyekto.

Keywords: Coffee table book, Tagapagtatag, Bai Hadja Fatima Matabay Plang, MIT-USM, Pagpapahalaga

10:40 –11:00

S430- Establishing Baseline Agriculture Performance and Rural Development Indicators from A Governance Perspective

Francisco Gil N. Garcia, Geoffray R. Atok, Nerissa G. Dela Vina and Jennet R. Mag-aso

11:00 –11:20

S431- Study on the Utilization of Marang Fruit (*Artocarpus odoratissimus* Blanco) and Assessment of Fruit Production in Mindanao

Norma U. Gomez and Roy B. Gacus

ABSTRACT. The general objective of this project is to study the utilization and assessment of fruit production of marang fruits in Mindanao. In conducting this project, the team used a triangulation method like archival research, key informant interviews among the key players along the chain (one-on-one interview, telephone interview/mobile/email communication),

benchmarking, competitiveness, profitability, and efficiency analysis. Results revealed that there is an underutilization of marang fruit in the Philippines wherein there is a wider gap between the supply and utilization and experienced ups-and-downs in three decades. Particularly in Region XII, the largest production of marang can be found in Cotabato Province (particularly in Makilala, Magpet and Kidapawan City). Information from farmers in Region XI is taken into consideration like socioeconomic and farming characteristics, volume produced per marang variety, number of marang trees and volume of production, harvesting practices, type and number of buyers/traders, farmgate and selling price of marang, volume sold during peak and lean seasons, method of selling, selling arrangement, mode of payment, volume and value of wasted/rejected marang during peak and lean seasons, cost and return pertree of marang production during peak and lean seasons, and critical logistic issues/problems.

Keywords: Marang buyers/traders, marang farmers, peak and lean season, and Region XII

11:20 –11:40

S424- Intermediate Teachers' Competence and Readiness in Teaching Writing in the English Language

Marcos F. Monderin, Reizelle Mae C. Amilbahar, Rhodora A. Melgar, Marlyn A. Resurreccion, Jerose L. Molina, Khadiguia O. Balah, and Lawrence Anthony U. Dollente

ABSTRACT. MURRAY, SEDRA A. 2021. CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful action) Amidst COVID 19 Kabacan, North Cotabato. Humanity is facing a health crisis nowadays which need to be addressed by working hand in hand from all walks of life. Although COVID pandemic seems to hinder mobility and all, when the determination to help is strong, then the goals of creating a difference in a target community will be achieved. CASAMA (Comprehensive Assistance and Services for Authentic and Meaningful action) Amidst COVID 19 of the College of Science and Mathematics aimed to 1). equip the beneficiaries with vocational/ livelihood/technical skills that ensure productivity like bamboo craft making, virgin coconut oil and soap making); 2) develop appropriate skills and self- reliance through the provision of biodiversity conservation, protection and or management, health, and technology; 3) enhance the technological capabilities of the community in utilizing available resources in their Barangay; 4) develop in rural folks the determination and value of hard work in putting into action skills introduced to them and motivate them to be empowered individuals who will serve as social and economic resources in their community; 5)create a sound policy together with the community and LUGs for the promotion of eco-tourism in Pisan; and 6) enhance math and physics teachers' competencies/teaching strategies in line with the latest platforms in online learning. A courtesy call was made to the Barangay Captain, Marlyn Bagoisan introducing to her the extension program of the CSM for the S.Y. 2021-2022. The project envisioned to utilize available resources in Pisan like bamboos and coconuts as a means of additional income for livelihood. Utilization of resources starts with introduction of technologies on Coco products like Virgin Coconut Oil, Soap and Vinegar making. On September 22-23, the CSM extension unit and some faculty members conducted workshop on VCO making. It was followed by soap making from VCO and ordinary coconut oil and vinegar making from coconut water on October 25-26, 2021. Said coco products will be of great help to improve economic status of the

grassroots in Pisan. Accompanied with the livelihood skills workshop is the organization of a cooperative to help beneficiaries establish and construct building for the mass production and display of coco products.

Keywords: Assistance, Services, Workshops, Community Empowerment, Self-Reliance

11:40 –12:00

S422- Development of Online Educational Contextualized and Indigenized Instructional Material Supplementing IP quality of Educational

Amme Rose L. Blonto-Nonol

ABSTRACT. The study is entitled Development of On-Line Educational Contextualized and Indigenized Instructional Material Supplementing IP Quality of Education. It aims to create on-line Instructional Materials (IMs) to supplement Indigenous Peoples (IPs) access to education, pursued to support CHED Memorandum Order No. 2, 2019 which was created for the Integration of Indigenous Peoples Studies/Education into the relevant higher education curricula.

Materials are developed, contextualized, and indigenized using Instructional System Design: ADDIE Model: Analysis, Design, Development, and Implementation (Watson, R). The analysis and design were founded on USM IP learning profile in 2019. Validation is also part of the process before pilot testing. Prior to pilot testing, the materials are subject to pre-test of 12-15 respondents then follows pilot testing to a minimum number of 30 and maximum of 100 respondents.

This study is still in ON-GOING status and it has gathered the following initial results within three quarters time span: created videos for Tboli, Erumanen ne Menuvu, Teduray and Blaan Tribal groups out of IP TOME-USM coffee table book entitled *Faces of Diversity*; wrote one original piece in Tboli perspectives and contextualized it into two more cultural groups- the Erumanen ne Menuvu and TagaKaolo)-a supplement material to SC Eng 312 Teaching English in the Elementary; and integrate indigenous knowledge to SocSci2 Peace and Development. These materials are still in the pilot testing stage.

1:00 –1:20

S423- Tracer Study of the University of Southern Mindanao Criminology Graduates

Richard T. Camara

ABSTRACT.

- At present, there were 47 responses out of 338 population in this study.
- Sent an individual message and link of tracer survey via messenger to the respondents.

- Requested the USM BS Criminology alumni officers to help reach out the respondents.
- Sent the link of tracer survey via facebook.
- Sent the link for USM Criminology tracer study survey to the other GC like Kabacan Municipal Advisory Council (MAC), Kabacan MPS.
- Sent letter request to the NAPOLCOM Region 12 to seek assistance or endorsement.
- Sent letter request to the Philippine National Police Regional Office 11, 12 and BARMM.

Keywords:

1:20 –1:40

S427- Enhancing Ethics, Professional Responsibility and Lifelong Learning Competence of Engineering Students Through Outcomes-Based Teaching and Learning (OBTL) During Pandemic

Kharlo J. Subrio

ABSTRACT. This study aims to design, implement and evaluate an instructional system that employs outcomes-based teaching and learning (OBTL) in the enhancement of the competence of engineering students in terms of ethics, professional responsibility and lifelong learning and its impact on their learning approach and experience. Before the start of the class, data was gathered from the students in terms of their connectivity, device used, learning preference and prior knowledge. Results serve as input to the design of the Course Outcomes and Course Syllabus. Then pre-test was administered in which the level of knowledge based on the intended learning outcomes (ILO) was determined. Problems encountered during the study were unstable internet connectivity, unavailability of materials and resources, lack of motivation and low engagement among the students. The researcher tried to remedy them by utilizing Facebook as the online platform for asynchronous delivery since it can be accessed with free data and making occasional synchronous sessions through Messenger Rooms and Google Meet to discuss their concerns and motivate them in their studies.

Keywords: Ethics, Professional Responsibility, Lifelong Learning, Outcomes-Based Teaching and Learning, Engineering

1:40 –2:00

S433- Supply Chain Analysis of Pummelo in Selected Regions of the Philippines

Joeteddy B. Bugarin and Kathleen Ivy Z. Bolotaolo

ABSTRACT. The country's pummelo production has been declining since 2003 and the industry clearly waits for a needed intervention. Providing better opportunities in increasing the farm level incomes in the industry necessitates specific interventions in increasing productivity, improvements in production process to improve the low quality of pummelo produced and post-harvest handling of the product to avoid significant losses in the marketing system and increase overall pummelo production in the country. To evaluate the performance of existing pummelo supply chains and determine the effect of improvement that would be employed, specific key performance indicators under the three-dimensional definitions of efficiency, flexibility, responsiveness, and food quality were employed. However, no definite conclusions can be drawn as data is not yet complete at this point. Hence, all that will be presented herein were all initial findings only.

Keywords: Supply chain analysis, pummelo, key performance indicators