



ACCOMPLISHMENT REPORT 4th QUARTER 2021 PHILIPPINE ROOT CROP RESEARCH AND TRAINING CENTER

[Oct 1 -December 31, 2021]

1. On-going R&D Projects/Research (highlights of accomplishment for each research project/study are provided below)

Program/Project/ Study Title	Proponent/s	Lead Agency	Collaborating Agency	Highlights of Accomplishment
VSU Funded				
<i>National Cooperative Testing (NCT Projects)</i>				
NRCCTP 012- NCT Sweetpotato	Dilberto O. Ferraren	VSU	ISU, CLIARC, UP-IPB, DARFO5, UP La Granja, CENVIARC, USM, NOMIARC	<ul style="list-style-type: none"> Set up Experiment (Rainy Season) Propagate lines and variety under trial to be used Gather and analyze data
NRCCTP 013- NCT Cassava	Lisa I. Arce	VSU	ISU, CLIARC, UP-IPB, DARFO5, UP La Granja, CENVIARC, USM, NOMIARC	<ul style="list-style-type: none"> Continuous propagation of cassava entries adequate for 10 cooperating stations Maintain and established Regional Yield Trial
NRCCTP 014- NCT Taro	Dilberto O. Ferraren	VSU	ISU, CLIARC, UP-IPB, DARFO5, UP La Granja, CENVIARC, USM, NOMIARC	<ul style="list-style-type: none"> Moderate to high infection of Phytophthora leaf blight was observed in some entries particularly BLISM 115, PRG-744 and PRG-813 during this period. Maintained regional trial of 8 promising genotypes under upland condition and established propagation plots for the 10 taro varieties and 7 promising genotypes.

NRCCTP 015- NCT Yam	Nestor L. Pido	VSU	ISU, CLIARC, UP-IPB, DARFO5, UP La Granja, CENVIARC, USM, NOMIARC	<ul style="list-style-type: none"> • Conducted Yam Regional Trial. • Maintained propagation of yam recommended varieties. • Conducted Tissue-cultured derived GY-8 experiment. • Data gathering of Yam Regional Trial and GY-8 experiment
<i>Germplasm Collection and Maintenance</i>				
PRCRTC 114- Maintenance, characterization and documentation of sweet potato germplasm	Lisa I. Arce, Joy C. Codog	VSU		<ul style="list-style-type: none"> • Maintained sweet potato collection with 900 accessions • Land Preparation was done for propagation of sweetpotato varieties • Propagated recommended varieties • Distributed some recommended varieties to farmers and research individuals
PRCRTC 075.01- Field Maintenance, Characterization, Evaluation of Cassava	Lisa I. Arce, Joy C. Codog	VSU		<ul style="list-style-type: none"> • Maintained 261 accessions including varieties and rescued accessions with low survivability in the field. • Established and maintained two propagations. • Rescued and established 40 accessions for advance characterization
PRCRTC 077- Gabi, Takudo, Sincamas Assessment and Genetic Resource Conservation and Utilization	Dilberto O. Ferraren	VSU		<ul style="list-style-type: none"> • Replanting of taro accessions and varieties were done 100 percent • Clearing operation on the damage

				<p>brought by typhoon Odette, those trees felled on the experimental area and branches carried by strong winds.</p> <ul style="list-style-type: none"> • Taro varieties/accessions and minor root crops were maintained in the Philrootcrops germplasm area. • Weeding, hilling up and application of organic (chicken manure) and inorganic fertilizer were done regularly. Irrigating the field were done whenever necessary. • Recommended taro varieties and accessions were planted and maintained in a bigger area for mass production of planting materials.
PRCRTC 107-Maintenance and Characterization of PhilRootcrops Yam Germplasm Collection	Nestor L. Pido	VSU		<ul style="list-style-type: none"> • Morphological characterization is covering only the local species, which are of primary interest. Overall, characterization of local yam species (<i>D. alata</i>, <i>D. esculenta</i>, <i>D. hispida</i>, <i>D. bulbifera</i> and <i>D. pentaphylla</i>) is now about 100% complete.
RSPR 076.12.11-Development and maintenance of a GraphicRich Sweetpotato Germplasm Database	Alan B. Loreto	VSU		<ul style="list-style-type: none"> • Planted in pots for the 2nd season • Photo-documented 37 NSIC Approved varieties for mature

				<p>planting and 11 months after planting (harvested) to cover the last quarter activities. Reaction of the hybrids and varieties was based on natural field infestation and infection.</p> <ul style="list-style-type: none"> • All seven hybrids appeared highly susceptible to papaya mealybugs and only two (NSIC-Cv 43-2-2 and NSIC CV-45-2-5) seemed moderately resistant to red spider mite. • there was no infection of phytoplasma from planting until harvest. Very low infection of necrosis and brown leaf spot was observed during the entire cropping season. The low level of infection did not provide the ideal condition in the selection of resistant and tolerant hybrids.
PRCRTC 075-S3 STUDY 3- Screening and evaluation of cassava hybrids for tolerance to under shade and salinity	Lisa I. Arce	VSU		<ul style="list-style-type: none"> • Twelve (12) selected cassava varieties have been established and maintained • Soil Analysis has been done
RSPR 93.042 Breeding Sweet Potato for Yield and Quality Phase (IV)	Lisa I. Arce	VSU		<ul style="list-style-type: none"> • Continue in maintaining the sweetpotato polycross breeding nursery by re-

				<p>planting, weeding, under brushing, and repair of bamboo post damage by typhoon as well as collection of seeds.</p> <ul style="list-style-type: none"> • Continue in maintaining the sweetpotato evaluation trials by weeding, hilling-up, application of fertilizer in the whole area. • Harvesting of sweetpotato trial were postponed due to typhoon (Odette). • Maintaining the production of good quality sweetpotato planting materials. • Other duties, such as general cleaning in the Philrootcrops grounds and VSU campus after typhoon.
PRCRTC 140 Taro Breeding for Adaptability to Different Agronomic Management Schemes and Environmental Conditions	Dilberto O. Ferraren	VSU		<ul style="list-style-type: none"> • Gathered data on pest and disease occurrence in all established trials. Very minimal pest infestation/infection was observed in all standing trials • Maintenance and monitoring of ongoing trials were also undertaken. The following trials are ; Replicated trial (5 genotypes), General yield trial (7 genotypes), Single plot trial (10 genotypes), Single row trial (50 genotypes) and Single plant trial (110 new

				genotypes).
<i>PhilRootcrops Pest Management Projects/Research</i>				
RSPR 0510.1211.02 Cost-Effective Integrated Pest Management in the Production of Quality Root Crops Planting Materials	Erlinda A. Vasquez	VSU		<ul style="list-style-type: none"> Continuous production was done to provide a year-round supply of quality planting materials to qualify for BPI accreditation and certification. Three high-yielding NSIC-registered scab -resistant sweetpotato varieties, NSIC Sp 25, NSIC Sp 30 and NSIC Sp 36 and a scab susceptible NSIC Sp 17 were planted in November 2021 for the January-February 2022 supply. Cassava plants as sources of quality planting materials were almost totally damaged after Typhoon Odette hit the experimental areas on December 16, 2021.
<i>Soil and Nutrient Management Projects/Research</i>				
RSPR 14- 1416-04 Micronutrient Studies for Rootcrops: Zn, Fe, Cu Biofortification of Purple Yam and Sweetpotato for increased Yield and Improved Crop Quality	Anabella B. Tulin	VSU		<ul style="list-style-type: none"> Statistical Analysis is still underway
<i>Post-harvest and Processing Projects/Research</i>				
RSPR 04.115 Validation of microbial starter production for the fermented beverages	Inish Chris P. Mesias	VSU		<ul style="list-style-type: none"> Conducted optimization experiment for cocoyam cookies

from rootcrops and optimization and verification of cocoyam food products				<p>following the central composite design (CCD)</p> <ul style="list-style-type: none"> • Evaluated the physical characteristics (thickness, diameter, spread ratio) • and physico-chemical properties (moisture content and water activity) of the produced product • Analyzed the • experimental data using Statistica version 6 software
Developing vegetable value chains to meet evolving market expectations in the Philippines	Blanche Franchette D. Llera			<ul style="list-style-type: none"> • Online training on Pesticide Residue Rapid Test Kit conducted by the National Crop Protection Center (NCPC) - University of the Philippines Los Baños (UPLB) for pesticide residue analysis in pilot value chain farms. • Sampling and analysis of irrigation water, soil, and crop from VSU model farm, Baybay, Mahaplag and CALCOA for E. coli detection. • Sampling and analysis of harvested crops obtained from CALCOA, VSU model farm and crops brought from VSU market for pesticide residues, focuses on organophosphates and carbamates.

				<ul style="list-style-type: none"> Preparation and submission of soil samples obtained from Cecilia Cantero and William Alberro farm for heavy metal analysis, specific on lead (Pb), to Central Analytical Service Laboratory (CASL).
<i>Climate Smart Agriculture Projects/Research</i>				
CRA AMIA- Regional Climate-Resilient Agri-fisheries (CRA) Assessment, Targeting & Prioritization in Leyte Province for Adaptation and Mitigation Initiative (AMIA)	Alan B. Loreto	VSU		<ul style="list-style-type: none"> Developed and planted Agri-Fishery Enterprise for DA region 8 Validated the adaptive capacity data
<i>Internationalization Projects</i>				
VSU-IP-2021-01 High-Throughput Field-Phenotyping (HTFP) of Major Rootcrops Using Unmanned Aerial Vehicle (UAV)	Arce, LI Loreto, AB Bravo, MA Marañan, GI Olana, RC Vasquez, EA	VSU		<ul style="list-style-type: none"> Established sweetpotato propagation set-up Attended the training and practiced using the flame spectrometer to measure chlorophyll content. Because of high percentage of lodging in cassava due to Typhoon Odette, entire cassava set-up, both lodged and standing were harvested, and yield data was gathered on Dec. 20-22, 2021
Study 1. Assessment of Agroclimatic Conditions on the Growth and Yield of Cassava and	Geleca Ignanes-Marañan Dioscoro M.			<ul style="list-style-type: none"> Collected agroclimatic data from VSU Agromet Station Gathered data for

Sweetpotato	Bolatete			percentage survival and # of man-days per activity
Study 2. Multispectral and Hyperspectral Imaging (HIS) of Cassava and Sweetpotato Plants at Different Stages of Growth				<ul style="list-style-type: none"> Collected drone images (multispectral and hyperspectral) for both cassava and sweetpotato set-ups during 3MAP data collection for cassava and monthly for sweetpotato Processed data images for analysis
Study 3. Agromorphological Characterization of Cassava and Sweetpotato Varieties				<ul style="list-style-type: none"> Gathered 3MAP of replanted cassava plants Consolidated and organized gathered data on 3MAP of original and replanted cassava Gathered characterization data for initial set-up of sweetpotato Collected lodging incidence from cassava area after typhoon Odette
Study 4. Nutrient Update and Yield of Cassava and Sweetpotato Varieties in Response to Soil Management and Fertilization				<ul style="list-style-type: none"> Submitted the initial soil samples for analyses from the cassava and sweetpotato areas. Applied the required amount of fertilizer for both sweetpotato and cassava set-up. Gathered and consolidated 3MAP plant height and canopy data for replanted plants of cassava set-up.
Study 5. Monitoring and Evaluation of Pest and Disease				<ul style="list-style-type: none"> Gathered data for monthly monitoring of pests and

Incidence of Different Cassava and Sweetpotato Varieties				<p>diseases for cassava and sweetpotato set-ups</p> <ul style="list-style-type: none"> • Set-up cages for confirmation of unidentified potential insect pest of sweetpotato • Set-up confirmation tests of pathogens identified in sweetpotato
VSU-IP-2021-4 Development of Automated Drying System for Cassava Grates Using a Real-time Moisture Content Sensor	Daniel Leslie S. Tan	VSU		<ul style="list-style-type: none"> • Set-up of the sensors and Pneumatic dryer system prototype. • Make Arduino program for the temperature-humidity sensor. • Conduct experiments and comparative analysis of the acquired sensors at PhilRootcrops.
VSU-IP-2021-8 Developing a Smart and Sustainable Disaster Risk Management Model for Eastern Visayas Component 1 Enhancing the resilience of the communities at risk to natural hazards.	Anabella B. Tulin Anabella B. Tulin			<ul style="list-style-type: none"> • Coordinated with City Mayor's office and the Liga ng mga Barangay to get the contact numbers of the 92 barangay captains of Baybay City. • Created Focus Group Discussion questionnaire for the interviews with the members of the Barangay Disaster Risk Reduction Management Committee (BDRMC)

<p>Component 4 Development of Graduate Programs Suitable for Disaster Management Involving Joint Offerings with Belgian Universities and Other Partner Universities</p>	<p>Anabella B. Tulin</p>			<ul style="list-style-type: none"> • Contacted barangay officials to arranged schedule for the FGD with the members of the BDRRMC • Conducted FGD with the members of the BDRRMC committee in Poblacion Zone 8 and Zone 9 of Baybay City. • Created a transcription on the FGD with Poblacion Zone 8 and Zone 9. • Accepted application for internship with 2 foreign students (KU Leuven) • Virtual MOA Signing (Aceh, Indonesia) (December 09, 2021) • Hired two Graduate Teaching Assistants (GTA) from Zimbabwe and Czech • Accepted two Graduate scholars from Nepal and Banda Ache Indonesia
<p>Component 5 Livelihood Opportunities for Women in Disaster Prone Areas</p>	<p>Anabella B. Tulin</p>			<ul style="list-style-type: none"> • Attended the training on "Training on Micronutrient biofortification, nutrient requirement and cultural management of

				<p>sweetpotato” together with City Agricultures Office (CAO) and the different sweetpotato farmers in the City (October 28-29, 2021)</p> <ul style="list-style-type: none"> • The experimental area for sweet potato and yam were already established. It was monitored from time to time (e.g. weeding and gathering of necessary data). • Created field handbook for sweetpotato and yam production (ongoing revision) • ISBN application accepted for SP Handbook • Harvested 2 sweetpotato varieties (SP 35 and Haponita) at Brgy Pangasugan (November 22-23, 2021) • Prepared and conducted tissue analyses (e.g. chlorophyll a & b and monomeric anthocyanin) • Data Analysis (STAR Software)
External Funded				
<i>Pest Management Projects/Research</i>				
Evaluation and Adaptability Trial of Phytoplasma-Resistant Cassava Varieties in Regions 2,3,7,8, & 10	Erlinda A. Vasquez	VSU	DA-BAR (Funding Agency) DA-RFOs 2,3,7, and 10	<ul style="list-style-type: none"> • The phytoplasma-resistant cassava varieties were already mature enough to be harvested for

				<p>planting materials delivered in the four regions in December 2021. However, there was no distribution done since no boats were allowed to sail the week before the onslaught of Typhoon Odette.</p> <ul style="list-style-type: none"> • Around 80% of standing crops were damaged after the typhoon, and buds on the stem of uprooted cassava germinated, which could no longer be used as planting materials. • There was also a proliferation of bud growths of the 20% less affected plants, thereby reducing the usable stake as planting materials.
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Tissue Culture Projects/Research

Purple Yam (<i>Dioscorea alata</i> L.) Quality Planting Material Production through Aeroponics"	Geleca Igdanes-Maranan	VSU	PCAARRD (Funding Agency)	<ul style="list-style-type: none"> • Collecting soil sample for analysis • Data collection from yam field set-up • Maintenance and monitoring activities for yam.
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Post-harvest and Processing Projects/Research

<p>Pilot Testing of Portable Vacuum Frying System for Mushroom and Portable Extruders for Rice-based Products in Central Luzon (3 studies)</p> <p>Study 1. Pilot testing of the portable vacuum frying system for mushroom products</p>	Daniel Leslie S. Tan		DA-BAR (Funding Agency)	<ul style="list-style-type: none"> • Conducted preliminary and optimization experiments on the base material of extruded rice-sweetpotato and rice-cassava puff (on-going) • Conducted physico-chemical and
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<p>Study 2. Pilot Testing of the portable extruders for Rice-based products</p> <p>Study 3. Quality Assessment and Improvement of the Food products produced by portable vacuum frying system and the portable extruders in the pilot sites</p>				<p>sensory analysis. Data gathered were recorded and analyzed through STATISTICA software. Significant results were achieved</p> <ul style="list-style-type: none"> • Purchase request was approved and an alternative method of procurement was requested and granted by BAC. The fabricator of the extruder and vacuum fryer has been selected by BAC
<i>Extension and Socio-Economics Project/Research</i>				
20201050.1.94 Enhancing The Development of Sweetpotato Food Value Chains in Central Luzon, Albay, Leyte and Samar and Linkaging with Related Industries Phase 2	Daniel Leslie S. Tan	VSU	PCAARRD (Funding Agency)	<ul style="list-style-type: none"> • Facilitated the needs assistance to PO's in all for the improvement of their production areas and processing center. Conducted refresher trainings from production to marketing. • Facilitated market linkage of sweetpotato based products to partner consolidator in Metro Manila and Mindanao. On-going development of a sustainability plan. • Market tested the vacuum fried sweetpotato and done with the analysis of the result of the survey. • Developed the very portable vacuum

				<p>frying system and evaluated its advantage compared to existing vacuum fryers in terms of cost, efficiency and capacity.</p> <ul style="list-style-type: none"> • Piloted the developed vacuum fryer to new sites in Alameda Farm Surigao del Sur, Polomolok South Cotabato and Dapitan Zamboanga and conducted trainings on machine set up, processing and maintenance. • Developed 3 food products (vacuum fried SP, SP wine, SP bread). • Done with the analysis and given functional characteristics of the food products. • Developed 2 investment portfolios for the newly developed vacuum fryer and orange variant vacuum fried SP. • Developed 1 learning guide on the Vacuum Frying System • Developed 1 Value Chain Mapping and Performance Analysis Guide. • Developed 1 SSOP manual that will serve as the standard for all Sweetpotato Food processing centers. • Established partnership to three
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				pilot sites (MOA done and signed) <ul style="list-style-type: none"> • Mapped out developed value chains. • On-going documentation of the process of developing value chains.
Development of Business Plans, Promotion and Commercial Production of Improved Portable Extruder for Puffed and Chippy Products	Daniel Leslie S. Tan Marlon M. Tambis	VSU	DA-BAR (Funding Agency)	<ul style="list-style-type: none"> • Preparation and processing of MOA for the transfer of technologies to beneficiaries • Preparation of terminal report. • Presentation of project poster to Regional RDE Symposium (5th placer)

2. A Total of eight (8) trainings conducted with 203 clientele served for the duration of October-December, 2021 (details are found in PhilRootcrops-VSU EXTENSION QUARTERLY REPORT OF ACCOMPLISHMENT FORM)
3. Visit from the personnel of the Bureau of Plant Industry for the sweetpotato nursery accreditation has been accommodated.
4. Processed procurement of laboratory equipment for the Genomics Laboratory (Php 20,000,000.00 worth).
5. One (1) new project with 4 studies under the Future's Thinking Program has been approved for implementation (December 2021-November 2022)
6. Distributed approximately 150,000 sweetpotato planting materials to farmers in Baybay, Southern Leyte, and Samar.

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