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Nanotech R&D Facility inaugurated

INSET: Gracela Ortiz, representing DBM Region 3 Director Isabel Taguinod, and BAR Director Nicomedes Eleazar lead the ribbon-cutting ceremony. PHOTO: CNABAO

To further enhance the emerging field of nanotechnology in the region for the agri-fishery sector and the industry, the Central Luzon State University (CLSU) launched the country's first Nanotechnology R&D Facility on 23-24 July 2019 in the Science City of Muñoz, Nueva Ecija.

As part of its initiative to strengthen its R&D program, CLSU received assistance from different government agencies and private institutions to support the establishment of the facility and acquisition of nanotechnology-related research equipment. Among these agencies and institutions include the Bureau of Agricultural Research (BAR); Department of Science and Technology through the Philippine Council for Industry, Energy, and Emerging Technology Research and Development (PCIEERD), and Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD); Department of Budget Management (DBM) Region 3; ITS Science Philippines; Sigmatech Incorporated; and Nanotech Analytical Services and Training Corp (NASAT) Labs.

The R&D facility houses an office, two laboratory rooms, conference room, and staff room containing state-of-the-art equipment for nanotechnology. Sample products and prototypes such as nano calcium, nano silica, and gold-reducing agent were also presented and displayed.

Gracing the inauguration were Dr. Nicomedes Eleazar, BAR director; Dr. Enrico Paringit, PCIEERD executive director; Dr. Reynaldo Ebora, PCAARRD executive director; Gracela Ortiz, representing DBM Region 3 Director Isabel Taguinod; Dr. Tereso Abella, CLSU president; Dr. Fe Porciuncula, vice president for Research, Extension, and Training; and Dr. Juvy Monserate, head of the Nanotechnology R&D Facility.

"With these potentials of nanotechnology in agriculture, we, at BAR, in line with the thrust of the Department of Agriculture towards promotion of agriculture and fisheries development, growth, and sustainability, is in full support on this initiative," says BAR Director Eleazar.

In his message, Director Eleazar

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BAR conducts mid-year review, sets bar higher

To ensure that programs and activities are synchronized with its mandates and thrusts, the Bureau of Agricultural Research (BAR) conducted its 2019 Mid-Year Review and Planning Workshop on 2-4 July 2019 at the Development Academy of the Philippines in Tagaytay City.

In his opening remarks, BAR Director Dr. Nicomedes P. Eleazar, highlighted the first semester accomplishments of the bureau and recognized the dedication and commitment of the officers and staff for the successful results of the agency's research and development (R&D) programs and endeavors.

"We have proved that we have met and went beyond our objectives as we keep on surpassing what has been expected of us. BAR's overall performance is a reflection of the bureau's commitment to quality and excellent delivery and service to R&D clientele," Director Eleazar said.

Apart from the presentations of the first semester accomplishments and plans for the second semester of the year by the division and unit heads of the bureau, lengthy discussions on the preparations for the bureau's ISO 9001:2015 Quality Management System Certification and the strengthening the organization also took place.

Officially launched in April 2019, the ISO 9001:2015 certification aimed to standardize the operations of the agency to provide excellent services to its R&D stakeholders and clienteles. Practically, all ISO-related strategies and concerns including the crystallization of the BAR-Quality Policy Manual were discussed.

Meanwhile, setting the directions for the second half of the year, the bureau chief emphasized to zero-in on the following measures to be diligently undertaken as follows: implementing the RDE Continuum; crafting of the Strategic Plan 2020-2025; and formulating the capacity building plan/roadmap for BAR employees.

To keep abreast on the various accomplishments of the divisions and units involved, BAR officers presented their salient achievements and plans for the second semester.

Judith Maghanoy, finance head, presented updates on FY 2019 BAR budget and the status of the bureau's fund utilization; Joell Lales, head of the Program Development Division (PDD), reported the accomplishments and plans of the division; Salvacion Ritual, head of the Program Monitoring and Evaluation Division, presented the highlights of ongoing and completed projects under the Community-based Participatory Action Research (CPAR) program. She also updated the group on the upcoming CPAR Congress this October 2019; Anthony Obligado, head of the Technology Commercialization Division (TCD), presented TCD's accomplishments and highlighted the preparations for the National Technology Forum and Production Exhibition; Marjorie Mosende, assistant head of the Institutional Development Division, reported the division's achievement and laid out second semester plans;

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BAR Director Nicomedes P. Eleazar recognizes the dedication and commitment of the staff. PHOTO: PRLESACA

BAR Chronicle
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This publication provides regular updates on DA-BAR's activities as the country's national coordinator for agriculture and fisheries R&D. It also highlights features and news articles concerning NaRDSAF-member institutions.

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CALABARZON opens PGR center

INSET: Engr. Arnel De Mesa (center), DA-RFO CALABARZON regional executive director, and Digna Sandoval (2nd from right), BAR assistant director, lead the ribbon-cutting ceremony. PHOTOS: JALAXAMANA

On behalf of the Bureau of Agricultural Research (BAR) Director Dr. Nicomedes Eleazar, Assistant Director Digna Sandoval graced the inauguration of the newly established Plant Genetic Resources (PGR) Center located in the Department of Agriculture-Regional Field Office CALABARZON Southern Tagalog Integrated Agricultural Research Center on 19 July 2019 in Marawoy, Lipa City, Batangas.

Also present in the activity were officials and staff of DA–RFO CALABARZON including Regional Executive Director Arnel De Mesa; Regional Technical Director (RTD) for Research and Regulations Elmer Ferry; RTD for Operations and Extension Dennis Arpia; and Research Division Chief Digna Narvacan.

The facility is envisioned to continuously operate for the strengthening of RDE efforts on crop improvement by maintaining and enhancing plant genetic diversity in the region. As a repository, it is equipped to provide a storage condition conducive for medium to long–term germplasm conservation. It will also serve as a venue for capacity building through workshops and trainings for scientists, researchers, extension workers, farmers, and other stakeholders. It aims to be a catalyst of positive change in terms of food security, crop improvement, poverty eradication, and environment protection.

BAR, through its Research Facility Development Grant (RFDG), supported the establishment and upgrading of agriculture and fisheries R&D facilities and acquisition of equipment by providing funds and support to its RDE network members. ### ***(Jireh Alodia R. Laxamana)***

CLSU Nanotechnology...from page 1

also highlighted the potential of the R&D facility to deliver outputs that will improve the field of agriculture and fisheries such as innovation on precision farming techniques, efficient use of inputs, and effective systems for processing, storage, and packaging among others.

Aside from the inauguration ceremony, the two-day event was highlighted with a series of training-seminars on nanotechnology led by experts on nanotechnology R&D and material science engineering. Participants who attended the event were researchers and students from different universities and institutions in the country including those from CLSU, University of the Philippines (UP) Diliman, UP Los Baños, UP Visayas, Bicol University, Tarlac Agricultural University, and Research Institute for Tropical Medicine.

The project started in July 2017 and was funded through the Research Facilities Development Grant of the BAR Institutional Development Division. ### ***(Clarisse Mae N. Abao)***

UPLB unveils OARDEC

(L-R) UPLBFI Executive Director Casiano Abrigo, Jr., BAR Director Nicomedes Eleazar, and UPLB Chancellor Fernando Sanchez, Jr. unveil the facility marker of OARDEC. PHOTO: CNABAO

To provide the research, development, and extension support system and services for the full implementation of the Organic Agriculture Act in the university, the University of the Philippines Los Baños (UPLB), through the Agricultural Systems Institute-College of Agriculture and Food Sciences (ASI-CAFS) and the UPLB Foundation Inc., inaugurated the Organic Agriculture Research, Development, and Extension Center (OARDEC) on 26 July 2019.

Funded by the Bureau of Agricultural Research (BAR) through its Research Facilities Development Grant (RFDG), the OARDEC will serve as a venue for conducting strategic RDE, capability building, market and industry information, policy studies, and network development related to organic agriculture. Established at UPLB, a recognized research and extension university in the country and in the ASEAN, and a center of excellence in agriculture, forestry, agricultural engineering, and various other disciplines, the UPLB OARDEC can serve as a training ground for farmers, students, researchers from other agencies, and other clients. Furthermore, it can serve as a "one-stop-shop" research center to promote package of technologies on organic agricultural practices to the general public.

Present in the event were BAR Director Nicomedes Eleazar; BAR Assistant Director Digna Sandoval; UPLB Chancellor Fernando C. Sanchez, Jr.; UPLBFI Executive Director Casiano Abrigo, Jr.; UPLB Vice Chancellor for Planning and Development, Dr. Marish Madlangbayan; UPLB CAFS Dean Elpidio Agbisit, Jr.; ASI-CAFS Director Pearl Sanchez; ASI-CAFS Deputy Director Virgilio Villancio; National Institute of Molecular Biology and Biotechnology Director Marilyn Brown; Office of International Linkages Director Simplicio Medina; and Program Leader of the Organic Agriculture Program in UPLB, Dr. Blesilda Calub.

"With the different Organic Agriculture R&D Centers strategically placed in different parts of the country, we are responding to the needs of the stakeholders while simultaneously promoting organic agriculture as a sustainable farming practice," said BAR Director Eleazar.

Since the Organic Agriculture R&D Program started, 21 Organic Agriculture R&D Centers have already been established and inaugurated, 16 in DA-Regional Field Offices and five in state universities and colleges, including UPLB.

RFDG seeks to strengthen the R&D capabilities of the National Research and Development System for Agriculture and Fisheries member-institutions through the provision of research facilities and acquisition of modern laboratory equipment. ### ***(Clarisse Mae N. Abao)***

BAR conducts...from page 2

Julia Lapitan, head of the Applied Communication Division, updated the group on the division's corporate-imaging activities and plans; Melissa Resma, head of the Information Management Unit, shared its IT-related activities and plans; Gretel Rivera, Administrative Division, discussed administrative concerns and accomplishments.

Joell Lales, in behalf of Assistant Director Digna Sandoval, said in his closing remarks that the mid-year planning workshop has been very productive and the key to achieving all the plans laid out can only be achieved if all work cohesively together. Cynthia Remedios de Guia, assistant head of PDD, served as facilitator and moderator for the activity. ### ***(Patrick Raymund A. Lesaca)***

BAR, partners gear up for rice R&D mechanization program

The Bureau of Agricultural Research (BAR) conducted a meeting and workshop for the "Rice Mechanization R&D Agenda and Program" on 17-19 July 2019 at Angeles, Pampanga.

Representatives from partner research-implementing agencies involved in Rice R&D including Philippine Rice Research Institute (PhilRice), International Rice Research Institute, Philippine Center for Postharvest Development and Mechanization (PhilMech), and Bureau of Agricultural and Fisheries Engineering attended the said event.

The activity aimed to review and harmonize the rice mechanization research and development (R&D) plans and agenda of the different institutions and update the mechanization of R&D projects to be anchored on the Philippine Rice Industry Roadmap.

Also present were project implementers from the University of Philippines–Los Banos, Central Luzon State University, and representatives from Department of Agriculture – Regional Field Offices (DA-RFOs) 3, 4A, 6, and 7, along with BAR-Program Development Division Head Joell Lales and selected BAR focal persons for Rice R&D Program.

Ralf Ceniza of the DA–National Rice Program presented the several challenges that significantly affected the rice production in the country. Some of the common problems identified were high cost of inputs, low price of palay, irrigation system, labor problem, and lack of postharvest facilities.

As labor is one of the major inputs in rice cultivation, Ceniza stressed that it accounts for substantial proportion of total rice production cost. To relatively reduce labor use, some of the solutions seen by DA were the widespread use of farm machinery and the adoption of other labor-saving technologies.

The use of farm machinery targets to increase labor productivity and efficiency through timeliness of operations. This will further increase cropping intensity, reduce labor requirement and its production costs, and provide more income for farmers.

In addition, Alice Mataia of PhilRice presented the "Philippine Rice Value Chain Analysis" followed by Dr. Normida Pasado of PhilMech who presented "PhilMech's R&D Programs and Projects in Rice Mechanization."

Guided by the R&D Area Matrix Framework, the group assessed how various projects fit and align with the research priorities identified using the embedded segments of input of production, post-production, harvesting, and processing.

The identified new and continuing researchable areas will serve as reference material for BAR to identify priorities in relation to rice mechanization R&D projects for the year 2019-2022. The material also provided an overview in harmonizing the efforts of the bureau and R&D-implementing partners in addressing rice mechanization concerns. ### ***(Leoveliza C. Fontanil)***

Participants identify possible researchable areas in rice post-production, harvesting, and processing. PHOTO: LFONTANIL

BAR, FAO conduct 5th PSC Meeting

To ensure the smooth implementation of the GCP/PHI/062/GFF project, the Bureau of Agricultural Research (BAR) and the United Nations Food and Agriculture Organization (UNFAO) conducted a Technical Working Group meeting and the 5th PSC meeting on 29-30 July 2019 at The Sulo Riviera Hotel, Diliman, Quezon City.

The project titled "GCP/PHI/062/GFF: Dynamic Conservation and Use of Agro-biodiversity in Traditional Agro-ecosystems of the Philippines" is funded by the Global Environment Facility (GEF) through FAO with BAR as the lead agency in implementation.

Present were the members of the GCP/PHI/062/GFF PSC and TWG, namely: DA Undersecretary for Operations Engr. Ariel Cayanan; FAO-Program Management Coordinating Unit (FAO-PMCU) Coordinator Virginia Agcopra; FAO Representative Tamara Palis-Duran; and FAO-Regional Office for Asia and Pacific (FAO-RAP) Lead Technical Officer, Dr. Bo Zhou. The meeting was also participated by consultants for the different components of the project; members of the provincial local government units of Ifugao and South Cotabato; and experts from Philippine Rice Research Institute, Bureau of Plant Industry, Department of Environment and Natural Resources, Agricultural Training Institute, National Commission for Culture and Arts, and Philippine Center for Postharvest Development and Mechanization.

Joining them from the bureau are BAR-Program Development Division Head Joell Lales and select BAR focal persons for FAO Ian Jomari Panaga and Matthew Janssen Ty.

Included in the agenda were the findings for the midterm review from June 2016 to May 2019, updated PMCU's work plan and log frame containing the project's key activities and sustainability plan in the next years. The policy and institutional review, market study and value chain analysis of ABD crops in Lake Sebu, ABD mapping, inventory and analysis, and ABD communications/ knowledge products were also included in the components discussed in the meeting.

"To all our project partners and collaborators, we are all directed to use knowledge to create a holistic and integrated approach on mainstreaming agro-biodiversity in traditional agro-ecosystems. It is essential that this will be communicated to all stakeholders for the institutionalization and sustainability of our initiative," said DA Undersecretary Cayanan.

The GCP/PHI/062/GFF is a project that aims to enhance, expand, and sustain the dynamic conservation practices to sustain globally significant agro-biodiversity (ABD) in traditional agro-ecosystems of the Philippines. ### ***(Matthew Janssen C. Ty and Clarisse Mae N. Abao)***

BAR facilitates AMIA 2 turnover

Representatives from DA-SWCCO, DA-ICTS, DA-FOS-SPCMAD, DA-MED, BAR, and ATI convened to discuss the AMIA 2 program outputs. PHOTO: RHERMOSO

The Bureau of Agricultural Research (BAR) convened concerned government agencies and offices to facilitate and disseminate the program outputs of the Adaptation and Mitigation Initiative in Agriculture (AMIA) 2 on 15 July 2019 in Diliman, Quezon City. Cynthia Remedios de Guia, BAR-Program Development Division assistant head and climate change focal, presided over the meeting.

Representatives from Department of Agriculture-System Wide Climate Change Office (DA-SWCCO), Agricultural Training Institute, DA-Information and Communications Technology Service, DA-Field Operations Service-Special Projects Coordination and Management Assistance Division, and DA-Monitoring and Evaluation Division attended the meeting.

AMIA is DA's flagship program on climate change which envisions to enable communities in the agriculture and fisheries (AF) sector

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CGUARD reaps fruits, reaches new milestones

Consultants of the National Corn Program and members of the Corn TWG convene to ensure the smooth implementation of the CGUARD program. PHOTO: LFONTANIL

The Bureau of Agricultural Research (BAR) called for a Technical Working Group (TWG) meeting to ensure the smooth implementation of the Corn Germplasm Utilization through Advanced Research and Development (CGUARD) program, 16 July 2019 at the Bureau of Plant Industry, Malate, Manila.

The meeting provided an outline agenda on the members and consultants of the Department of Agriculture (DA)-National Corn Program to discuss and deliver the accomplishments of the CGUARD R&D Program.

Present were consultants of the National Corn Program and members of the Corn-TWG, namely: Dr. Artemio Salazar, Dr. Cesar Quicoy, and Dr. Edralina Serrano of thr University of the Philippine Los Baños (UPLB); Dr Candido Damo of the DA-National Corn Program; and Engr. Roger Navarro of the Philippine Maize Federation (PhilMaize).

Bureau of Plant Industry Director Dr. George Culaste, BAR-Program Development Division Head Joell Lales, and selected BAR focal persons for Corn R&D Program also attended the meeting.

Dr. Artemio Salazar of the Institute of Plant Breeding-UPLB and consultant of National Corn reported that as of June 2019, a total of 3,157 traditional corn varieties were collected through the DA-Regional Field Offices. Three hundred thirty-three of which has been characterized by IPB-UPLB, with two percent portion of collected varieties identified to have special traits.

Among the special traits identified were: 1) six varieties wre resistant to Asian corn borer which were collected from National Plant Genetic Resources and regions 10, 12, and 1; 2) five varieties were resistant to drought which were collected from the regions 12 and 4B; 3) five varieties were resistant to high pH collected in the regions 5, 6, 13, and 7; 4) six varieties were resistant to low pH collected from regions 13, 12, 7, and 4B; and 5) five varieties were resistant to water-logging that comes from regions 4A, 2, 6, and 13.

The following were also discussed during the meeting: 1) revision of guidelines on seed production, conservation, and distribution of traditional corn varieties; 2) amendments in the National Management Committee for CGUARD program; and 3) crafting of production guide and catalog for collected and characterized traditional corn varieties.

CGUARD, a program led by the DA-National Corn Program in collaboration with BAR and other agencies, aims to conserve the existing native and traditional varieties in the country. The program also seeks to develop breeding materials using native germplasm and determine the genes responsible for different unique traits in traditional corn varieties. ### ***(Leoveliza C. Fontanil)***

DLSU Economists' Convention sees importance of agri-fishery R&D

Cynthia Remedios de Guia (left) of BAR and Chrissa Borja of Peterson Projects and Solutions (center) share their insights during the panel discussion on "Uplifting Farmers' Lives: Digital Redistribution of Agricultural Education." PHOTO: ALLARENA

The De La Salle University – Economics Organization conducted the annual Young Economists' Convention (YEC) held last 19-20 July 2019 at the DLSU Henry Sy Sr. Hall.

On its 11th year, the convention focused on the 4th Industrial Revolution (FIRe) bearing the theme "Reinventing the Skills of the Future." The event highlighted how FIRe affects the different sectors that comprise the Philippine economy.

Part of the panel discussion was Bureau of Agricultural Research's (BAR) Planning Officer, Cynthia Remedios de Guia, who represented BAR Director Nicomedes Eleazar during the said event. De Guia talked about how modern technology and research can aid in the development of the agriculture sector of the Philippines. Also present as panelist was Chrissa Borja, Program Manager at Peterson Projects & Solutions (Thailand). The two were assigned on the topic "Uplifting Farmers' Lives: Digital Redistribution of Agricultural Education."

The discussion revolved around the following subtopics: (a) challenges to the agricultural sector with regard to FIRe; (b) contributions of FIRe in the improvement of the conditions of the said sector; (c) ways to empower agricultural workers to adapt to changes; (d) policies that could be proposed to ensure level footing of the workers; and (e) strategies to ensure that the policies will be sustainable.

During her talk, de Guia mentioned challenges to the sector such as weak delivery of extension services, missing linkages between the innovation and entrepreneurship ecosystem, and institutional weaknesses.

To address these issues, she shared the initiatives and efforts of the Department of Agriculture (DA) that is in line with FIRe, through the DA-Information and Communication Technology Service, in coming up with various information systems, both web and mobile-based, that target the needs of their clients. She mentioned efforts of the department such as the Philippine Rubber Information System, Juan Magsasaka Project, the Agricultural Supply and Demand Information System, and the One DA, One System, One Initiative Program. Also mentioned were BAR-supported projects like the Rice Crop Manager and Site Specific Nutrient Management which were successful in helping the farmers in improving their farm activities.

Lastly, she added that FIRe is an opportunity as this era promotes innovations to be able to address the needs of the sector, primarily to assist farmers and fisherfolk who are the main stakeholders of DA

The event is a culmination of conferences, seminars, and activities attended by students and delegates from different universities in the country. ### ***(Apple E. Llarena and Candice M. Guilaran)***

BAR facilitates...from page 6

to pursue sustainable livelihood while effectively managing climate risks. Implemented in 2016, AMIA 2 focused on building climate-resilient AF livelihoods and communities with funding support from BAR under the Climate Change R&D Program.

During the meeting, Leo Kris Palao and Joshua Martin Santos of International Center for Tropical Agriculture (CIAT) presented the knowledge products and other tools from the Climate Risk Vulnerability Assessment project based on CIAT's framework on building climate-resilient agricultural communities.

"Most of our tools revolve around the four-steps on building climate-resilient communities. For each question that we raise for each step, we have a series of tools and processes that answers those questions," explained Palao. This includes web-based platform, climate risk profile for Luzon, Visayas, and Mindanao, Climate-Resilient Agriculture (CRA) support platform, CRA investment briefs, and CRVA training materials.

Santos also discussed the monitoring and evaluation framework and tools developed by CIAT to systematize the planning, documentation, and use of AMIA-derived knowledge and experience to support achievement of CRA outcome at scale.

Rollie Osayan of DA-SWCCO also shared some updates on the National Color-coded Agriculture Guide (NCCAG) Map. NCCAG, a major output of AMIA 1, is a comprehensive map that identifies the crops that are most suitable in agricultural parcels, and overlays soil properties, elevation, rainfall pattern, temperature, and more importantly, the projected climate-induced multi-hazards. ### ***(Rena S. Hermoso)***

BAR strengthens irrigation projects

The Bureau of Agricultural Research (BAR), in close coordination with the Bureau of Soils and Water Management (BSWM) and the National Rice Program of the Department of Agriculture (DA), supports the implementation of the research and development (R&D) project titled "Identifying Suitable Sites for Small Scale Irrigation Projects (SSIP) in the Regions through Geographic Information System (GIS)-based Water Resources Assessment."

As part of BAR's mandate, a review, monitoring, and planning workshop for the Mindanao SSIP R&D Group was conducted on 24-26 June 2019 in Davao City. The activity aimed to assess the accomplishments of the projects, discuss key issues and concerns, share implementation experiences and strategies, and harmonize future plan of activities.

Present in the activity were the members of the SSIP R&D Project Management Team from BAR, BSWM, Central Luzon State University, and state universities and colleges (SUCs) implementers including Central Mindanao University, J.H. Cerilles State College, University of Southern Mindanao, and Caraga State University. Southern Philippines Agribusiness and Marine and Aquatic School of Technology hosted the activity.

The study is one of the priority R&D projects under the DA's SSIP Master Plan being led by BSWM. Through the project, a GIS-based framework was developed and adopted to be used in determining suitable SSIP sites. It hopes to generate regional and provincial water resources assessment maps in the Philippines for SSIP planning and development, and to enhance capacities of the SSIP implementers, researchers, and extension workers in the regions.

This is being implemented nationwide by 17 partners in Luzon, Visayas, and Mindanao. ###

(Raymond Patrick L. Cabrera)

Rainfed lowland tech highlight rice R&D review

INSET: Dr. Sailila E. Abdula, acting executive director of PhilRice, officially opens the Rice R&D Program Project Review. He encouraged everyone to strengthen the extension efforts for the benefit of rice farmers. PHOTOS: RHERMOSO

To ensure the proper implementation and assess the impact and milestones of the projects funded by the Bureau of Agricultural Research (BAR) through the Rice R&D Program, the bureau through its Program Monitoring and Evaluation Division (PMED) reviewed six projects on 31 July 2019 at the Philippine Rice Research Institute (PhilRice) Central Experiment Station in Science City of Muñoz, Nueva Ecija.

Of the six projects reviewed, three projects were on rainfed lowland rice technologies. One of which is the PhilRice multi-purpose (MP) seeder designed for rice and adapted for corn and mungbean. It is the first hand tractor-mounted MP seeder released in the Philippines. According to John Eric O. Abon, the MP seeder was developed to improve the crop productivity in drought-prone rainfed lowland areas. Operation manual for the MP seeder has also been developed. Fine tuning and improvement of the unit are ongoing.

Meanwhile, another PhilRice project evaluated the effectiveness of actinomycetes in enhancing the growth and yield of rainfed lowland and upland rice. Sandro D. Cañete, project leader, said that the best suitable inoculant carrier for actinomycetes is a soil-based inoculant. The project team were also able to identify a persistence of actinomycete on soil and analyze biodiversity of soil microflora at different time points under controlled and field conditions. Higher yield in field sites compared to controlled sites was also observed.

A project spearheaded by the University of the Philippines Los Baños (UPLB) focused on evaluating promising rainfed rice lines. Dr. Jose E. Hernandez, project leader, explained that the study aims to

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BAR ups soybean promotion during in-house seminar

To support the promotion and utilization of local soybean in the country, the Bureau of Agricultural Research (BAR) through its Applied Communication Division conducted a seminar on soybean production and processing, 25 July 2019 at the BAR Annex Building, Visayas Avenue, Quezon City.

Dr. Ma. Cecilia R. Antolin, project leader from the Philippine Center for Postharvest Development and Mechanization (PhilMech), and Dr. Olivia M. Del Rosario, soybean expert from the University of Philippines – Los Banos (UPLB) served as resource speakers during the said event.

Dr. Antolin discussed the topic "Integrated Soybean Production and Postharvest Technologies for Improved Local Supply and Utilization" which focused on soybean postharvest and production systems that can be adopted by farmers, traders, and processors who are interested in processing soymilk and other soybean-based products.

Meanwhile, Dr. Del Rosario talked about the nutritional value of soybean, along with current good manufacturing practices. Moreover, he demonstrated the proper procedure on processing soymilk, *tokwa*, and *taho*.

Dr. Ma. Cecilia R. Antolin (inset) of PhilMech and Dr. Olivia M. Del Rosario of UPLB serve as the resource speakers during the in-house seminar. PHOTOS: LFONTANIL

Aware of the growing interest of the private sector and those who want to venture in the soybean industry, the Department of Agriculture and BAR continuously support researches as well as strategies in promoting soybeans. Among these initiatives are the development of local soyfood enterprises and promotion of its health benefits to raise awareness among the public. ### ***(Leoveliza C. Fontanil)***

17 HVCDP, CC projects reviewed

The Bureau of Agricultural Research (BAR) reviewed 13 projects under the High Value Crops Development Program (HVCDP) and four under the Climate Change (CC) R&D Program on 17-18 and 30 July 2019 at Diliman, Quezon City, respectively

The extent of possible microbial and pesticide contamination of select vegetables and the appropriateness of postharvest handling technologies to minimize food safety hazards were among the topics discussed during the HVCDP review. Recommendations to maintaining quality and prolonging shelf-life of select vegetables were also laid down.

On the other hand, the documentation and assessment of climate change-adaptation practices and strategies of indigenous and lakeside fishing communities were the focus during the CC review. Also discussed were the mechanisms that would enable regional field offices of the Department of Agriculture to provide climate change-adaptation support services to its clientele; and the study that explored biochar as a soil amendment that reduces pollutants in the air as well as enhances the soil quality.

Salvacion Ritual, BAR-Program Monitoring and Evaluation Division (PMED) head; Kris Thea Marie Hernandez, PMED focal; Arnold Timoteo and Jose Jeffrey Rodriguez of the Department of Agriculture-High Value Crops and Rural Credit evaluated the HVCDP projects.

Meanwhile, Dr. Mudjeekewis Santos of the National Fisheries Research and Development Institute; Dr. Luis Rey Velasco and Paul Ramirez of the University of the Philippines Los Baños; and Cynthia Remedios de Guia, BAR-Program Development Division assistant head, reviewed the CC researches. ### ***(Patrick Raymund A. Lesaca and Ephraim John J. Gestupa)***

DA backs garlic R&D *for increased production*

Text and photo by Patrick Raymund A. Lesaca

Garlic (*Allium sativum*), also known as "*bawang*," is one of the most popular cultivated crops in the country. It is mainly used as a condiment for flavoring meat, fish, and salads, either fresh or in dehydrated forms. It is also known to lower blood sugar and cholesterol levels. Its many health-promoting attributes have resulted in medicinal pills, drinks, and powder-based garlic extracts.

However, in 2019, the Philippine Statistical Authority reported that garlic production was registered at 6.49 thousand metric tons (TMT), which was five percent lower compared to the same quarter last year with 6.84 TMT. Garlic production has been consistently declining by 5.94 percent over the past 10 years.

As such, the Department of Agriculture (DA), through its High Value Crops Development Program (HVCDP), has calling for increased garlic production. In ensuring so, several measures have been undertaken including multi-sectoral dialogue among garlic farmers and stakeholders, provisions of credit, and research and development (R&D) interventions.

"If we currently produce only 8 percent of the total supply, then our initial target would [sic] be to increase it to 30 percent to 40 percent within two to three years' time. The DA will embark on a massive garlic planting across identified areas in the country and even considering [sic] military camps as viable lands for expansion," Agriculture Secretary Emmanuel Piñol said in an article published in 2017.

Pursuant to the call, the Bureau of Agricultural Research (BAR) collaborated with the Bureau of Plant Industry-Los Baños National Crop Research Development and Production Support Center (BPI-LBNCRDPSC); Mariano Marcos State University (MMSU); DA-RFO 1-Ilocos Norte Research & Experiment Center (INREC); and the University of the Philippines Los Baños (UPLB) to embark on a two-phased project focused on garlic production.

Funded by BAR, Phase 1 covers the "Selection, Purification, and Multiplication of Garlic Cultivars for Regions CAR, 1, 2, 3, 4, 5, and 6", while Phase 2 is on "Multi-location Adaptability Trials of Registered Garlic Varieties and other Cultivars" in the regions mentioned.

R&D Garlic Interventions

The projects aimed to boost the yield per hectare of garlic, develop healthy and virus-free planting materials, and explore other potential areas for expansion.

The registered garlic varieties used in the studies were the Ilocos White, Batanes Red, Ilocos Pink, Mexican, Miracle Bang-ar, Ilocos Tan Bolters, and MMSU Gem. The Ilocos White is the most common variety planted for commercial production and has a potential yield of 3.5 tons per hectare.

The provinces identified as projects sites were Daet, Camarines Norte; Pili, Camarines Sur; Masbate

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Reviving papaya industry with new PRSV-tolerant hybrids

Text and photos by Jhon Marvin R. Surio

Papaya (*Carica papaya*) is considered one of the most promising tropical fruits grown in the Philippines because of its great economic potential. Commonly known as a backyard fruit, papaya has long been in the books as a major export crop which is relatively easy to grow and is available throughout the year. Because of its unparalleled productivity, papaya is considered as a good cash crop.

The papaya plant is also popular for its highly nutritious fruits packed with vitamins, nutrients, and antioxidants. Its fruits can be eaten as a vegetable while still green and unripe, or when they are already yellow, yellow-orange, or red and ripe.

During the 1980s, a disease severely struck down the papaya industry in the country, badly affecting a wide array of farmers. Reports about the presence of the disease were first documented in Silang, Cavite in 1982 but were only confirmed during 1984 when the outbreak is already at an epidemic level. This forced papaya farmers to abandon an entire plantation resulting to severe losses and a drastic increase in the price of papaya. The disease is known as the papaya ringspot virus (PRSV) to which no tolerant variety was known in the country back then.

PRSV is transmitted by aphids that are found on the leaves of the papaya plants. Once infected by the virus, the leaves of the plant start turning yellow. On the other hand, distinct "ringspotting" (small circles resembling water-soaked or oily spots) appear on the fruits of the infected plant. These spots remain even after the fruits have ripened. The spots make the fruits highly susceptible to fungal growth, inflicting more damage to them.

Since then, the negative effect of PRSV to the papaya industry in the country has endured through the years. In the years 2008 to 2013, a declining trend has been reported as a result of the decrease in production and total area planted with papaya. The average growth rates documented were -1.81% and 1.80%, respectively (Espino & Espino, 2015). Sadly, it agrees with the data provided by the Philippine Statistics Authority for the period 2010 to 2012, where net profit-cost ratio from papaya reached

a new low of 0.03 from 2011's 0.11 and 2010's 0.20. Less farmers plant papaya because of the serious damages that PRSV inflicts to their crops; hence, the crashing of the said industry.

This then led to an initiative in finding a PRSV-tolerant variety back in 2012, spearheaded by the Institute of Plant Breeding (IPB) of the University of the Philippines Los Baños (UPLB).

Funded by the Bureau of Agricultural Research (BAR), Dr. Pablito Magdalita of IPB-UPLB embarked on a study titled "Field Trial and Technology Piloting of New PRSV-Resistant Papaya F1 Hybrids," which aimed to develop a new variety that is tolerant from the destructive disease.

In 2016, the project commenced by collecting germplasm from known tolerant varieties foreign from the country. Bill Anderson, a colleague of Dr. Magdalita from Australia, introduced him to a number of disease-resistant foreign varieties.

Aware of his colleague's interest and current undertakings in papaya research, Anderson provided some assistance to Dr. Magdalita by identifying and bringing some varieties to the country.

Anderson backed the economic value of papaya in the international market, saying that it is a very popular table fruit because of its good texture and sweet and flavorful taste, with various industrial uses as well.

After the collection of germplasm from tolerant varieties, local ones were improved by infusing them with genes of tolerance. The parents of these varieties were then purified and hybridized with each other to produce new varieties. The three varieties of F1 hybrids developed were called *Hirang*, *Liyag*, and *Timyas*.

One of the testing sites of the project was located in Sto. Tomas, Batangas. Through the cooperation of its Municipal Agriculturist Office (MAO), they allowed Dr. Magdalita to utilize their technology demonstration farm for the purpose of the project.

MAO Agriculturist II Melanie Cortez detailed how their collaboration for the project began. She recounted that they willingly let Dr. Magdalita and his team to conduct the trials for the new varieties in their farm because they know the relevance of the project.

"*Laganap din kasi talaga sa* papaya farmers *sa lugar namin ang* PRSV. *Kaya* thankful *kami na naging* part *kami ng* study *na ito*," Cortez said. In return, Dr. Magdalita trained the papaya farmers in their area and taught them how to properly manage the crops. Field testing was also done in two other sites: Los Baños, Laguna and Silang, Cavite.

Results of the study concluded that compared to common papaya varieties, F1 hybrids are moderately tolerant to PRSV, producing medium to large fruits with thick flesh, and sweet, good eating qualities.

Dr. Magdalita hoped that through the study, papaya production in the country will increase tenfold especially in South Luzon. Farmers are also expected to engage in papaya farming again, this time producing good quality yet more affordable fruits which in turn can provide more source of income to them. ###

F1 Hybrids *Liyag*, *Hirang* and *Timyas* are moderately tolerant to PRSV compared to common papaya varieties.

BAR, UPLB celebrate CFV success in summit

Text and photos by Ephraim John J. Gestupa

Upland farming communities are among the most vulnerable stakeholders of the agriculture sector because of soil erosion and degradation.

In response to this, an initiative led by the University of the Philippines Los Baños (UPLB) was launched titled "Research and Development Program Towards Upscaling the Barangay Sagip-saka (Conservation Farming Villages) as a Strategy for Climate Change Adaptation and Sustainable Upland Development in Selected Provinces in the Philippines."

The project aims to forge collaborative efforts between farmers, local government units (LGUs), and the academe so that sustainable, climate-resilient technologies can be developed, utilized, and promoted among upland farming communities.

Funded by the Bureau of Agricultural Research (BAR), the Conservation Farming Villages (CFV) initative serves as a modality wherein upland farming communities are capacitated with climate-resilient agricultural technologies. Started during 2007, the CFV is otherwise known as the Barangay Sagip Saka project.

"*Marami sa* upland areas *natin ay dating* forest *na naging sakahan*. Unfortunately, *yung pagsasaka ay may seryosong* cost of degradation *sa lupa kung hindi tamang ginagawa. Maraming* upland areas *na rin ang nama*-manage *ng* communities, whether formal or informal," said Dr. Rex Victor Cruz, former UPLB chancellor and project leader, on the history of the study.

He also underscored the need for a shift on how upland farmers think about their practice, a change in worldview. While land is a sure factor for a farmer's survival, the way and pace upland farmers use their resources play an important role in determining just how long they can they enjoy its benefits. By providing local farmers with organization and skills trainings, conservation efforts are packaged in a way that enhances farmers' worldview, encouraging them to voluntarily learn more about improving the quality of the environment as they seek to improve their livelihood.

During the third National CFV Summit held recently, UPLB announced that it is now gearing for the second phase of the project as they look into the expansion of CFV beyond the five pilot sites located in the provinces of Ifugao, Albay, Quezon, Negros Oriental, and Davao

INSET: (L-R) Eliseo Ruzol, mayor of General Nakar, Qu
of the City Planning Development Office in Ligao City,
of La Libertad, Negros Oriental share their experiences

del Norte.

Through the avenue provided by the summit, proponents and regional partners had a platform to share their experiences and make plans for the CFV initiatives.

Through the summit, UPLB convened with the project's key movers from pilot provinces. Reports from the delegates highlighted the milestones accomplished through the project after it was turned over to their respective LGUs. UPLB Vice Chancellor for Academic Affairs Portia G. Lapitan and Dr. Cruz both acknowledged the LGUs during the summit and expressed gratitude for being active partners in carrying out the project's activities at the barangay level.

In his presentation, Mayor Eliseo Ruzol of General Nakar, Quezon anchored their LGU's community development plans to the CFV project, saying that it was the initiative that laid a good foundation for community planning. Picking up from their learnings, Mayor Ruzol's municipality has adopted a single-document approach to streamline and converge all community development project initiatives undertaken by his administration.

On the other hand, Marial Soledad Peña from the City Planning Development office of Ligao City, Albay reported that the LGU in her area has added CFV to the municipality's annual budget and local environmental code.

In addition, Mayor Emmanuel Laurence Iway of La Libertad, Negros Oriental enumerated the awards received by various farmer organizations established through CFV. He also talked about how the project has helped link upland farmers to greater market opportunities.

Picking up from the reports of the LGUs, Dr. Cruz shared the framework which can serve as guide of upscaling the CFV project at a national level through the establishment of the National Guidelines for Community-based Upland Agriculture.

Considering that CFV is not the only community development initiative to successfully penetrate upland farming areas, Dr. Cruz says that it is most ideal for UPLB to collaborate with other agencies and program implementers in coming up with a hybrid project that addresses the gaps lacking in CFV.

(Ephraim John J. Gestupa)

ezon; Maria Soledad Preña, officer-in-charge Albay; and Emmanuel Laurence Iway, mayor s and insights on the CFV project.

DA backs garlic R&D...from page 11

City; Miag-ao, Iloilo and San Carlos City, Negros Occidental for the Western Visayas Region; Ilocos Norte, Cagayan, Kalinga, Isabela, Nueva Vizcaya, Benguet, Abra, Quezon, and Laguna.

Reports obtained from project proponents revealed that Ilocos White, Ilocos Pink, Mexican, Miracle, and Tan Bolters varieties performed well, and were selected and elevated to purification and multiplication stages. The said varieties adapted well on local conditions and are now simultaneously being mass produced for the availability of planting materials for the garlic multi-location adaptability trial in Regions 3, 5, and 6.

Meanwhile, the Miracle variety consistently has the highest yield from the evaluation and multiplication trials with 4 tons/ha. Likewise, MMSU revealed that the average yield per hectare was significantly affected by the location and not by the variety planted and their interaction.

Garlic planted in Benguet and Isabela provinces obtained a comparable yield of 7.94 tons/ha and 7.02 tons/ha, respectively. These were followed by those planted in Nueva Vizcaya, Pasuquin, and Kalinga provinces with 5.95 tons/ha, 5.66 tons/ha, and 4.94 tons/ha, respectively. Increased production in the said areas are extremely remarkable considering the national average of 3.5 to 4 tons per hectare.

Furthermore, it should also be noted that except for Ilocos Norte and Nueva Viscaya, the areas were planted with garlic for the first time; hence, the natural fertility of the soils from these provinces are still high.

Results of the first-year trials revealed the potential of producing garlic in non-traditional growing areas in Regions 2 and CAR as manifested on the high yield obtained from the different testing sites. However, different varieties vary in performance in different locations.

Based on studies and research conducted, producing garlic in non-traditional areas is plausible and increased production is attainable.

(Patrick Raymund A. Lesaca)

BAR joins PAFT in annual convention; supports Farm-to-Table campaign

To keep food technology practitioners informed and updated with current developments in the country's food industry, the Philippine Association of Food Technologists, Inc. (PAFT) held its 58th annual convention last 10-12 July 2019 at the Crowne Plaza Manila Galleria, Ortigas Center.

With the theme "Future Food," this year's convention aimed to showcase innovative solutions toward the advancement of food safety, nutrition, and sustainability. Present in the event were food technologists and professionals from the food industry, government, and academe.

The Bureau of Agricultural Research (BAR) was invited by PAFT to talk about food safety for the plenary session. BAR Planning Officer Cynthia Remedios de Guia discussed "Greener Farm-to-Table through R&D Support" in which she highlighted the initiatives of BAR to attain food security, food safety, and sustainability through its banner programs – the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP).

In her discussion, de Guia highlighted CPAR as a pro-farmer program as it deals with improved farming system technologies and the active participation of farmers in the community to implement a holistic approach to the overall management of production systems. NTCP, on the other hand, aims to incubate and sensitize emerging technologies for the enhancement of value-adding products and processes toward a more competitive local industries.

To conclude her talk, she shared a message from BAR Director Nicomedes P. Eleazar stating: "With the complementary functions of NTCP and CPAR properly in place and in harmony with the other programs of DA, we can deliver all the necessary support to make Farm-to-Table initiative of the government more feasible and achievable, especially for our local farmers and the agriculture sector as a whole." ### ***(Apple E. Llarena)***


PHOTO: ALLARENA

Cynthia Remedios de Guia, BAR planning officer, presents the paper, "Greener Farm-to-Table through R&D Support."

Rainfed lowland tech...from page 9

develop crop improvement strategies to address biotic and abiotic stresses induced by variable and extreme conditions.

Dr. Sailila E. Abdula, acting executive director of PhilRice, graced the activity. He acknowledged the efforts exerted by various rice research institutes in developing good technologies. However, he also said that there is still a disconnection between rice research and development and extension. Thus, he also encouraged everyone to strengthen the extension efforts of rice researchers for the benefit of our rice farmers.

Dr. Eduardo Jimmy P. Quilang, PhilRice OIC-deputy executive director for research; Dr. Pompe C. Sta. Cruz of UPLB; Joell H. Lales, BAR-Program Development Division (PDD) head; Raymond Patrick L. Cabrera, BAR-PDD rice focal; and Jay Invinsor L. Bermas, BAR-PMED rice focal, evaluated the projects reviewed.

Other projects reviewed were on rice seed information system, improvement of yield ability of hybrids and parents, and information models on climate change-adaptive rice production technologies. ### ***(Rena S. Hermoso)***

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