



RTD Eduardo Gonzales of DA-RFU I underscores on having a synchronized information among the PIOs of the DA family.



Ilocos Norte Provincial Administrator Atty. Wendell Chua says that as information carriers of their respective agencies, the PIOs should promote information that will empower the people.



Caelistics Productions Inc., President and CEO Sally Jo Bellosillo, shares about the power of social media and how this can be effective means for the PIOs to deliver their message across, as well as in building an image for the DA.

PHOTOS:RDELACRUZ

the gaps for public information. "Let us synchronize our information. First, we need to help the Agriculture Secretary in telling the public what is going on, particularly the case of our Rice Self-Sufficiency Program. Statistics is also crucial in supplying the right information. Second, there are alternative crops that can substitute rice. Let us advocate what we say in 'Pangatang Makapalay'. The role of PIO is not a joke and information should come at a time wherein they are really needed. Let us synchronize information and also have a filtering mechanism for all the information that we address to the public so as to avoid

confusion," underscored RTD Gonzales.

Meanwhile, the overview of activities was presented to the group by Mr. Noel O. Reyes of the DA-Agriculture and Fisheries Information Division (AFID).

After the opening and the briefing were the presentations on the Updates of DA Banner Programs. Updates presented were on: Corn Program (RTD Eduardo Gonzales); High Value Commercial Development Program (Zayla Monica Javier); Fisheries Sector (Nazario Briguerra); and Livestock Program (Rachalle Ayllon).

In the afternoon, Ms. Sally Jo Bellosillo, president and CEO of Caelistics Productions Inc., lectured on the power of Social Media.

Her topics revolved on how the PIOs can use the social media as vehicle to deliver the message across, alongside building an image for DA. For the workshop, she conducted a simulation on news gathering using one particular event that can produce several products/outputs with different approaches/treatments. The group was divided into four and each representative presented their outputs. ### (Rita T. dela Cruz)

Alcala inaugurates BAR-funded R&D facility in Region IVA

Department of Agriculture (DA) Secretary Proceso J. Alcala led the inaugural ceremonies of the Post-Harvest and Food Processing Laboratory of the Southern Tagalog Integrated Agricultural Research Center (STIARC)-Region IVA in Marawoy, Lipa City on 8 November 2013.

Established through the DA-Bureau of Agricultural Research (BAR)'s Institutional Development Grant (IDG), the newly constructed facility is part of the bureau's efforts to upgrade institutional R&D capacities of National Research and Development System for Agriculture and Fisheries (NaRDSAF) member institutions.

Joining the secretary in the ceremonies was Ms. Digna Sandoval, OIC, BAR-Institutional Development

Division, who represented BAR Director Nicomedes P. Eleazar in the ribbon-cutting and marker unveiling ceremonies.

Awarded to STIARC-Lipa Agricultural Experiment Station (LAES), the R&D facility houses fixtures and equipment purchased under the project that will enable the station to fulfill its mandate as the Research Outreach Station (ROS) of STIARC. The current programs of the station, which centered on the research, development, production, and extension for upland agricultural zones in CALABARZON, are aimed to be intensified through the improved research systems and capability building that could be achieved by improving

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(top photo) DA Secretary Proceso Alcala and Ms. Digna Sandoval, OIC, Institutional Development Division of BAR, lead the marker unveiling ceremonies for the inauguration of the newly constructed/rehabilitated R&D facility of STIARC. PHOTOS:MVALDEABELLA

Eleazar visits BAR-supported R&D facilities in Reg. IVA



Dir. Eleazar monitors the various BAR-funded R&D projects being implemented by STIARC. PHOTOS:MVALDEABELLA

the R&D facilities in Southern Tagalog Integrated Agricultural Research Center (STIARC)-Region IVA in Marawoy, Lipa City on 19 November 2013.

Highlight of the visit was the inauguration of the DA-IVA Regional Soils Laboratory (RSL)-Mushroom Laboratory with Director Eleazar leading the ribbon-cutting and marker unveiling ceremonies.

The laboratory is one of the R&D facilities established through the BAR's Institutional Development Grant (IDG) Program.

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2013 ISSAAS Congress

pushes agriculture-tourism link

The Bureau of Agricultural Research (BAR) participated in the International Society of Southeast Asian Agricultural Sciences (ISSAAS) Congress as one of the major sponsors and exhibitors on 12-15 November 2013 at the Acacia Hotel, Manila. This year's congress carried the theme: "Linking Agriculture with Tourism: Meeting the Global Challenges of the Future" which looked into the development of agriculture and other related industries for the improvement of the country's economy.

Dr. Fernando C. Sanchez, Jr., vice chancellor for Planning and Development, University of the Philippines Los Baños (UPLB) and acting president of ISSAAS, spearheaded the ribbon-cutting ceremony together with the ISSAAS board of directors and members.

Various products supported by the BAR's National Technology Commercialization Program (NTCP) were showcased at the exhibit. Among the NTCP-supported products that were featured include: fruit wines, *adlai*, soybean, *sapinit* and Queen Pineapple by-products. Information



As one of the major sponsors and exhibitors, BAR showcases various products at the exhibit. These include fruit wines, *adlai*, soybean, *sapinit* and Queen Pineapple by-products. Wine tasting, alongside distribution of brochures and flyers, are among the activities prepared for the booth visitors. PHOTOS: RBERNARDO

Education and Communication (IEC) materials including brochures and flyers were also distributed to the visitors. Fruit and medicinal wines were also sampled for tasting to booth visitors.

The wines including *sapinit*, *ybanag*, *chico*, *bignay*, pineapple, tamarind and oregano were produced by the Department of Agriculture-Quezon Agricultural Experiment Station (DA-QAES), Isabela State University (ISU), Goyena's Tropical Fruit Wines, Big A Multi-Purpose Cooperative, and Green Rescue Organic Association, Incorporated.

Other highlights during the event included plenary sessions and educational tour at UPLB, The Rice World Museum at the International Rice



Research Institute (IRRI), Makiling Botanical Garden, Tagaytay City, Gourmet Farms, and Nuvali, Sta. Rosa Laguna. ### (Liza Angelica D. Barral)

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EMPOWERING THE PUBLIC

with "information that matters"



Public information officers of the DA family convene during its annual consultative meeting and seminar workshop, which also serves as a venue to give updates on what each respective agency is currently doing. In the photo are: Mr. Noel O. Reyes (12th from left) of DA-AFID and RTD Eduardo Gonzales (11th from left) of DA-RFU I. PHOTOS COURTESY OF RDELACRUZ



Information is empowering. A well-informed public makes informed decision, thus the main point of Atty. Wendell Chua, Ilocos Norte provincial administrator, who welcomed the participants in behalf of Governor Imee Marcos.

Held on 20-21 November 2013 in Laoag City, the "Public Information Officers' (PIOs) 2nd Semester Consultative Meeting and Planning Workshop" is being held twice a year. It serves as a venue for all information officers of the Department of Agriculture (DA) to get together and know what

each agency is currently doing. Linkaging and networking among them was also enforced in ensuring an inter-agency complementation in the field of information sharing and dissemination.

"As information officers, you all have special duties in your organization which is to inform the people. Information by itself is empowering, but there are bad and good information. Information that promotes empowerment are those that spreads on new technologies, research results, and breakthroughs. As PIO, you are the carrier of information of your agency. Thus, it is proper that you do not belittle your job!" said Atty. Chua.

Also present during the meeting was Regional Technical Director (RTD) Eduardo Gonzales of the Department of Agriculture-Regional Field Unit I (DA-RFU I). In his speech, he commended the "untiring efforts" of the information officers and hoped that these will bear fruits for the overall goals and objectives of the DA. Concurring to the earlier message of Gov. Marcos, RTD Gonzales also reiterated the importance of information and how it will be able to empower the people.

For the PIOs, he underscored their roles in filling

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BAR CHRONICLE is published monthly by the Applied Communication Division of the Department of Agriculture - Bureau of Agricultural Research, RDMIC Building, Visayas Avenue, cor. Elliptical Road, Diliman, Quezon City 1104 Philippines.

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.

dependent of each other, such as changes that occur in genetic diversity will also affect biological diversity, and vice versa. It also enables the crop to adapt to changing environments and avert uniformity, both of which are needed for survival. According to the International Rice Research Institute (IRRI), genetic diversity plays an important role in discovering new rice genes and traits that will eventually help our farmers to overcome the challenges in rice production.

Studying the upland rice in Arakan Valley

In Cotabato lies what is considered as the upland “rice belt” called Arakan Valley where a number of indigenous upland rice are thriving. With support from the Bureau of Agricultural Research (BAR), a study was initiated by Dr. Juliet Bangi of the University of the Philippines-Natural Sciences

In the study, 14 indigenous upland rice were collected from local farmers. These include *Azucena*, *Dinorado*, *Mal-os*, *Magalitok*, *Kapalawan*, *Mubpon*, *Manisi*, *Bungulan*, *Kawilan*, *Malundiang*, *Sinulid*, *Ulipapa*, *Dabao*, and *Hinumay*. They were subjected under laboratory and greenhouse experiments to characterize their seeds and plant structure. These include plant height, number of tillers per plant, number of days to flowering, number of panicles per plant, panicle length, and 1,000-grain weight.

Results showed that the indigenous upland rice are highly diverse with desirable characteristics. Among those studied, the tallest plants are the *Azucena* and *Hinumay*. Meanwhile, *Kawilan* had the highest number of tillers per plant as well as the panicles produced, and the *Malundiang* had the earliest flowering period. The longest

their morphogenetic characteristics. *Bungulan*, *Manisi*, *Kapalawan*, *Magalitok*, *Sinulid*, *Mal-os*, and *Dinorado* have varied and narrow genetic distance indicative of having distinct genes. With a dissimilarity index of 3.32, *Kawilan* and *Kapalawan* are upland rice with different genes.

These reflect the diversity of the indigenous upland rice in Arakan Valley based on their genetic makeup, and those that were studied are part of the genetic pool of resources in the locality. High-yielding varieties with promising potentials may emerge in the future as breeding efforts using our indigenous upland rice result in the successful improvement of grain quality, resistance to pests and diseases, and reduction in the maturity period, among many others. If effectively managed and used, they would be substantial in meeting the ever-increasing demand for food as the future unfolds. ###

Genetic diversity plays an important role in discovering new rice genes and traits that will eventually help our farmers to overcome the challenges in rice production. -IRRI

Research Institute (UP-NSRI) in cooperation with the local government unit of Arakan through the Municipal Agriculture Office, Manobo Lumadnong Panaghiusa (MALUPA) of Arakan, Cotabato, and SEARICE, an NGO helping the Manobo tribal community in Arakan Valley Complex.

The study seeks to determine the desirable rice gene characteristics through morphogenetic characterization and analysis of the genetic diversity of the indigenous upland rice in the valley. Understanding the structure and diversity of indigenous rice is needed by our scientists and researchers in the conservation and preservation of genetic resources that have potential uses for future breeding purposes.

panicle was produced by *Magalitok*, and *Ulipapa* and *Bungulan* had the heaviest 1,000-grain weight.

Meanwhile, in analyzing the genetic diversity of the rice, one of the most powerful tools used by scientists is through DNA markers. The study particularly used the simple sequence repeats (SSR) which are also called microsatellites. Among the DNA markers, SSRs are found to be the most efficient and cost-effective tool that can detect higher degree of polymorphisms in rice.

The study revealed that *Malundiang* and *Ulipapa* have 30-50 percent associated genes that possess the desirable qualities of being early-maturing and having high yield potential. *Bungulan*, *Mubpon*, *Sinulid*, and *Mal-os* have diverse genes, and are found to have desirable genetic makeup based from

Dr. Juliet Bangi is a post-doctoral fellow of the DA-BAR/UP-NSRI Post-Doctoral and Senior Scientist Research Fellowship in Basic Research in Agriculture and Fisheries. For more information about the study, you may contact her through (02) 981 8500 loc. 3611.

References:

1. Powerpoint presentation titled, “Genetic Diversity Analysis of Indigenous Upland Rice in Arakan Valley Complex, Cotabato, Philippines Using SSR Markers”, presented by Dr. Juliet Bangi during a seminar series held at BAR on 30 October 2013.
2. Choudhury, B., Dayanandan, S., and Khan, ML. (2013). Genetic structure and diversity of indigenous rice (*Oryza sativa*) varieties in the Eastern Himalayan region of Northeast India. Springer Plus 2:228.

BAR Director keynotes ISSAAS Congress closing ceremony



In his speech, BAR Director Nicomedes Eleazar (left photo) emphasizes the role of R&D in intensifying efforts towards promoting agritourism in the country. ISSAAS President Fernando C. Sanchez Jr. (right photo) awards the Plaque of Appreciation to Dir. Eleazar.

Director Nicomedes P. Eleazar of the Bureau of Agricultural Research (BAR) served as the guest speaker during the closing ceremony and farewell party of the annual convention of the International Society of Southeast Asian Agricultural Sciences (ISSAAS) held on 13 November 2013 at Acacia Hotel, Manila.

In his speech, Dir. Eleazar emphasized the role of research and development (R&D) in intensifying agritourism in the Philippines by utilizing technologies that produce quality products, developing integrated farms for eco-tourism tours, and dissemination of latest technological information and breakthroughs on agritourism. “It is through this strategy that we, as researchers, scientists, and academicians, can effectively educate the public about the important contributions of agriculture to the country's economy

and quality of life,” the bureau chief said.

The BAR director also stressed the importance of agritourism as it provides various opportunities not only to our local producers but also to people within the local communities especially the young ones to engage in agriculture. To further support his statement, Dr. Eleazar shared the continuing efforts of the Department of Agriculture through BAR in utilizing R&D through its two major programs: the National Technology Commercialization Program (NTCP) and the Community-based Participatory Action Research (CPAR). “Through these two programs, we are able to bring our farmer and fisherfolk beneficiaries the necessary results from up-to-date knowledge on information to technologies from various R&D endeavors that are needed to improve their incomes and

productivity. Apart from this, they are also able to shift from the conventional farming and fishery practices to a much more practical and efficient system,” he said.

Dr. Eleazar mentioned that the BAR's R&D Programs assure the farmers' greatest harvest through: 1) an improved production, 2) a more sustained and productive farming area, and 3) the introduction of value-added produce that will provide them additional income and livelihood. He said that “with these projects, I believe, we can say that we are agritourism-ready and that we are all geared up toward an agreed vision for the future—that is to provide a better life for Filipinos, made possible through the application of R&D.”

The BAR director cited specific successful BAR funded projects like Organic Agriculture Program in Bangkong Kahoy Valley in Dolores, Quezon and the production, utilization and commercialization of Philippine wild raspberry or *sapinit*. “With the support coming from the bureau, vegetable farmers in Bangkong Kahoy Valley have increased their awareness in organic farming methods such as the production of organic fertilizers and pesticides,” he added.

He concluded that agritourism provides various opportunities to farmers and community. “While farm

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Dir. Eleazar shares the latest Package of Technology (POT) on fruit wines produced by various implementing agencies and supported by BAR. PHOTO:RBERNARDO

“And with R&D, farmers are better equipped on how they can better optimize their yields and earn more. And eventually turn their farms into agritourism sites where people can find new strategies and ideas both for farming and entrepreneurship.”



PHOTO: PLESACA

Corn, cassava R&D projects reviewed

Corn and cassava are considered important crops in Philippine agriculture. Corn is the country's second most important staple and is used as feed ingredients for the livestock and poultry industry. Cassava, on the other hand, is regarded as one of the cheapest sources among the major starch-based feedstock for ethanol production.

To maintain the growth momentum of corn and to enhance cassava production, the Bureau of Agricultural Research (BAR) Corn and Cassava R&D Committee convened on 20-22 November 2013 in Silang, Cavite. The activity aimed to update the corn and cassava R&D agenda to increase production and empower farmers.

BAR Assistant Director Teodoro Solsoloy in his welcome remarks stressed key issues like low productivity, high production cost, postharvest facilities, and even the ill effects of extreme weather disturbances which according to him, have direct consequence on the production of traditional and high-value crops like corn and cassava. "These factors," he mentioned, "should not be neglected and thus, doable solutions and interventions through R&D must be given direct attention by the government."

Mr. Milo delos Reyes, head secretariat of the National Corn Program, underscored the critical role of BAR in the undertaking and

encouraged all key players to establish a mechanism that would increase farmers' production and productivity. Delos Reyes also emphasized the need for the government to lead and be proactive in combating the ill effects of climate change. He recommended that all corn and cassava R&D related project proposals must be coordinated with BAR for better coordination. The head secretariat also presented updates on the Corn Industry Roadmap.

Meanwhile, Dr. Artemio Salazar, research professor at the University of the Philippines Los Baños (UPLB) presented "Promotional Activities for White Quality Protein Maize (QPM)" wherein he zeroed-in on the malnutrition incidence in the Philippines and indicated that approximately four million (31.8 percent) of the preschool population were found to be underweight-for-age and about 2.7 million (24.5 percent) school children are suffering from malnutrition. To address this, a research study, funded by BAR, was conceptualized to show that corn combined with rice (rice composite) can improve weight gains in children faster. The study also showed that rice composites can be a means to alleviate malnutrition. Dr. Salazar concluded that R&D support on white corn and its program must be put in place to ensure the competitive quality of corn and income to the farmers.

Assistant Secretary Edilberto De Luna, coordinator of the National Corn Program, articulated on the

involvement of the private sector in yellow corn production which must be enhanced. "Postharvest facilities and the technology driven efforts of the government must be given priority if we all want to sustain the growth of the industry. We should come up with corn and cassava benchmark studies to reconcile production and technology gaps," he said.

The updates on cassava production and its effect to the industry and economy were presented by Dr. Candido Damo, coordinator of the DA Cassava Program. He highlighted the various uses of cassava for food, feed, fuel, and other industrial uses. The targets of the program in 2017 are to: increase production by 7.6 million metric tons, increase average yield to 20.0 mt/ha, and increase yearly income of farmers by 10 percent per hectare, among others. To achieve these targets, Dr. Damo proposed four strategies: 1) increase area to be planted, 2) increase yield and income, 3) improve quality of cassava and reduce harvesting and postharvest losses, and 4) increase consumption of cassava as food.

A paper titled, "Considering Farmers' Preferences in Breeding and Dissemination of White Corn Varieties as Staple Food in Addressing the Food Self-sufficiency of DA" was presented by Dr. Romeo Labios of UPLB. The study aimed to increase productivity,

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Study examines genetic diversity of Arakan Valley's indigenous upland rice

Story by Anne Camille B. Brion



The 14 indigenous upland rice used in the study are (clockwise): Azucena, Bungulan, Dabao, Dinorado, Hinumay, Kapalawan, Kawilan, Magalitok, Mal-os, Malundiang, Manisi, Mubpon, Sinulid, and Ulipapa. PHOTOS COURTESY OF JBANGI/UP-NSRI

Rice is and will always remain as one of the most important staple foods among Filipinos. For most of us, it is the one thing that satisfies and completes our every meal. However, the agriculture sector is continually faced by challenges brought about by factors that hinder rice production. These include the inevitable occurrence and effects of climate change, as well as the widespread infestation of pests and diseases, among many other unfavorable conditions.

The importance of genetic diversity

The Food and Agriculture Organization (FAO) of the United Nations recognizes genetic diversity as the foundation of improving the genes of the crop and has become an integral part in the domestication and cultivation of crops.

Genetic diversity is essential in maintaining the richness of biodiversity as the two are regarded as

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Commercialization of Microcontroller-based Coffee Roasting Machine". The project, led by Dr. Ruel M. Mojica of NCRDEC-CaVSU, aimed to pilot test and to commercialize the developed technology on roasting machine for profitable coffee processing business.

Results of the project were presented by Dr. Mary Jane D. Tepora, project staff, as one of the seminar topics during the BAR Seminar Series.

Named as the "Bravura Roasting Machine," it is the first-ever vertical coffee roaster. This coffee roasting machine has microcontroller device that completely controls its operation.

Dr. Tepora explained that the group of Dr. Mojica has established and modified the parameters for attaining the standard roast to arrive at a more efficient design using vertical design with auger to improve the roasting quality.

Part of the output of the project is the fabrication of two prototype roasting machines and one final prototype specifically for commercialization.

Dr. Tepora reported that the machine was introduced to the public through a product launch during the "Kapihan: 1st Coffee Day Celebration" in June 2012 at the CaVSU.

Given the initial success of its launch and the growing interest among local coffee growers, CaVSU has collaborated with the local government for them to introduce Bravura Coffee Roasting Machine in the municipality of Indang and other nearby towns of Cavite.

The machine can produce 10 kg of roasted coffee per batch of roasting and takes 20 minutes on the average to achieve the required roasting process. "Bravura is made of stainless steel materials with a well-designed auger that produces even bean roasting. It has single phase motor coupled with microcontroller device for automatic operation," added Dr. Tepora.

The machine can roast not only coffee but also peanut and cacao.

The Bravura is the cheapest roasting machine available in the market today. This locally-made roasting machine costs Php485,000 per unit or around US\$11,100. This is a lot cheaper than VR-10 (10 kg) of the United States (US\$35,958) or GHIBLI R-15 (5-15 kg) of Europe (US\$ 24,735).

The development and utilization of microcontroller-based

coffee roasting machine can provide income generating livelihood opportunities to smallscale farmers, coffee processors as well as the community members.

Indeed, this technology breakthrough will revive the Philippine Coffee Industry and bring the country closer to its previous glory as one of the lead producers of quality coffee beans. ###

SIGNIFICANT FEATURES OF BRAVURA COFFEE ROASTING MACHINE

- * Top cover is designed with an easy locking and unlocking mechanism.
- * Bottom cover is designed for easy discharge of product with safety lock.
- * Motor assembly is provided with guard and exhaust fan to cool off motor and bearing.
- * Provided with a sampling outlet for sampling of roasted bean.
- * The parameters for attaining the standard roast has been established and modified the existing Horizontal Roasted with ribbon-type mixer to arrive at a more efficient design using Vertical Design with auger to improve the roasting quality.
- * It did not use the conventional type of heater and which is maintenance free to give more efficient heating.

Information taken from the powerpoint presentation of Dr. Mary Jane Tepora of CaVSU



Coffee beans roasted from the Bravura coffee roasting machine PHOTO COURTESY OF CaVSU

yield, and income of the farmers in the project area under consideration utilizing the participatory varietal selection (PVS) approach and technology innovation systems. The paper won first prize under the Applied Research Category in the recently concluded BAR's National Research Symposium.

Mr. Joell H. Lales, head of the Planning and Project Development Division (PPDD) of BAR, reported on the Corn and Cassava R&D Agenda and Program to update the committee on BAR's interventions. He also enumerated on-going corn and cassava projects, as well as project proposals for funding.

To date, 42 on-going corn and cassava projects have already been funded by BAR and six are still in the pipeline for funding. These projects were identified and have been prioritized by the Corn and Cassava R&D Committees through various consultations. ###
(Patrick Raymund A. Lesaca)



Present during the review are: (clockwise) Mr. Milo delos Reyes, head secretariat of the National Corn Program; Dr. Teodoro Solsoloy, assistant director of BAR; Ms. Salvacion Ritual, head of BAR-Project and Monitoring Evaluation Division; Dr. Artemio Salazar of UPLB; Dr. Romeo Labios of UPLB; Asec. Edilberto De Luna, coordinator of the National Corn Program; Mr. Joell Lales, head of BAR-Planning and Project Development Division; and Dr. Candido Damo, coordinator of the DA Cassava Program. PHOTOS: PLESACA

Alcala inaugurates BAR-funded...from page 1



DA Secretary Alcala looks into the various products, projects, and equipment inside the Post-Harvest and Food Processing Center.

PHOTOS: MVALDEABELLA

and modernizing its facilities and physical structures.

Ms. Avelita Rosales, LAES superintendent, together with Ms. Vilma M. Dimaculangan, regional executive director of RFU-IV and Ms. Digna Narvacan, STIARC manager, joined Sec. Alcala as he looked into the various areas, facilities, equipment, and projects of the station.

With the station focusing on the development of upland crops and regional banner programs such as corn, cassava, rice, vegetables, *adlai*, soybean, banana, and other high-value fruits, LAES takes pride in showcasing the agri-machineries that they have in

the laboratory for the processing of these upland produce. These include the dough mixer, pulverizer, coco presser, soybean grinder, *uraro* micromill, cassava grater, *uraro* hammermill, and *uraro* extractor.

Consequently, the research station also featured how the processed produce can be value-added through the various food products they have made including cassava cake, *pichi-pichi*, *maja blanca*, *macapuno* sweets, *suman sa lihiya*, and cassava chips. Paper products developed from rice straws were also displayed in the laboratory.

Aside from the development

of upland crops, LAES also conducts downstream research and showcases Package of Technology (POT) on crop production. It also produces and distributes high quality planting materials, seeds, and tissue cultured plants; performs extension functions to the local government units, and farmer clients through technical assistance and field visitations, production and distribution of IEC materials, and conduct of seminars and trainings; and provides services in the diagnosis of pests and diseases on various crops. ### (Mara Shyn M. Valdeabellla)

Banana peduncle turns into valuable products



Products and by-products developed from banana peduncle include fiber, juice, boards, and fiber-enriched meat products.

PHOTOS COURTESY OF MATAVANLAR/UPLB-BIOTECH

Initially underutilized and left to waste, the banana peduncle is now considered as an agricultural innovation with various potentials that can significantly improve farming, health, and income.

“Fiber and juice are the main components of banana peduncle. Various products were developed from this lowly material using readily available equipment and simple technologies. Instead of being left to rot in the field, the peduncle can be utilized and thereby can emancipate small-holder farm income,” explained Dr. Mary Ann Tavanlar, researcher from the National Institute of Molecular Biology and Biotechnology (BIOTECH) based at the University of the Philippines Los

Baños (UPLB) on 28 November 2013 during a seminar organized by the Bureau of Agricultural Research (BAR).

The seminar on banana peduncle was based on a BAR-funded project titled, “Banana Peduncle: To Waste or Not To Waste” implemented by BIOTECH with Unifrutti Corporation, Forest Products Research and Development Institute-Department of Science and Technology (FPRDI-DOST), and Fiber Industry Development Authority-Department of Agriculture (FIDA-DA).

Every year, the Philippines generates an approximate of 2.3 million metric tons of banana peduncle and these were either utilized as compost or put to waste. This consequently motivated the project proponents, led by Dr. Tavanlar, to determine and utilize the components of peduncle for conversion into value-added products.

“Finding uses for the peduncle other than for compost was challenging,” stressed Dr. Tavanlar as she explained the rationale of the project. The peduncle, which holds the banana bunch, was found to be mainly composed of fiber and juice. These two were utilized to make various value-added products.

The fiber was used as pulp and paper products and composite fiber boards including resin-bonded and cement-bonded peduncle boards. Encouraging results were derived after the products were tested for their endurance, elasticity, and absorption.

The fiber was also processed into powdered banana peduncle (PBP) as a source of dietary fiber to make peduncle fiber-enriched meat products such as burgers, frankfurters, and re-structured ham. As a result, these meat products have higher fiber content, better moisture retention, and higher cooking yields than the meat products without PBP. Also, the production cost of meat products fortified with PBP is lower than that of the meat products without PBP.

“The reduction in the cost could be attributed to the lesser amount of meat in the formulation because this was replaced mostly by water and of PBP,” as stated by the proponents in the terminal report of the project.

Meanwhile, the juice was utilized to make a ready-to-drink calamansi juice fortified with potassium and sodium. Most commercial sports drinks contain potassium and sodium to prevent dehydration and to maintain

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The peduncle is the part of the plant which holds the banana bunch. It was found to be mainly composed of fiber and juice.

Bravura: Taking coffee roasting to new heights

Story by Rita T. dela Cruz

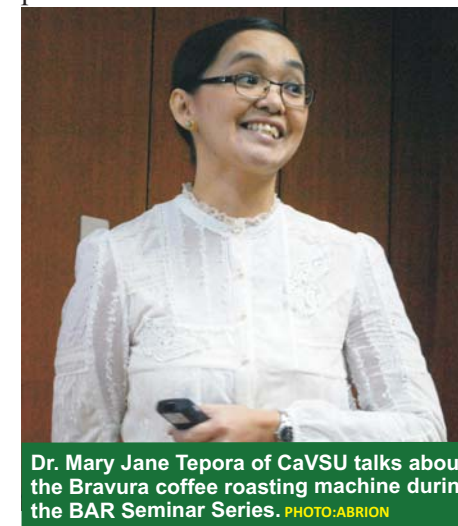
Coffee is an important crop in the Philippines as it is to the world. A priority crop of the Department of Agriculture (DA), coffee belongs to the country's top 10 agricultural crops in terms of value and second most traded commodity in the world.

The Philippines produces four good-tasting varieties of coffee, namely: Robusta, Arabica, Excelsa, and Liberica (locally known as “kapeng Barako”).

Robusta is high in caffeine which makes it perfect for high caffeine blends and main ingredient for instant coffee products and espresso. It makes up around 90 percent of the Philippine total coffee production. Meanwhile, the remaining 10 percent makes up the total output for Arabica, Excelsa, and Liberica varieties. Their special taste and aroma gave way to the high demand for gourmet and specialty coffees, both domestically and globally.

The importance of roasting

Coffee is never complete without the rigorous roasting process. Roasting adds significant value to coffee. Coffee lovers will not be able to enjoy its full flavor and aroma without going through the roasting process.



Dr. Mary Jane Tepora of CaVSU talks about the Bravura coffee roasting machine during the BAR Seminar Series. PHOTO: ABRION

Newly-harvested coffee beans start green when removed from the fruit of the tree. It is the roasting process that changes them from green beans to the various shades of brown, depending on roast preference.

For coffee farmers, roasting is also an important process which when optimally utilized can provide them with better profit. Often, coffee farmers in the Philippines, like those around the world, only sell their beans in raw form (green beans). If they can roast their own coffee, either individually or through the cooperative, they can sell their processed coffee at a better price rather than selling just the raw coffee beans.

There is a need therefore to develop a roasting technology that will enable them to process coffee and demand better price for their

product. Inevitably, this will help bring the country to a new height of not only producing high quality coffee but also help boost the country's coffee industry.

Here comes the Bravura

Given the potential of processed coffee in the market and the need to regain the industry's vigor, a coffee roasting machine that is both practical and easy to operate is important. Thus, the Cavite State University (CaVSU) through the National Coffee Research, Development and Extension Center (NCRDEC), in collaboration with the Bureau of Agricultural Research (BAR) under its banner program, the National Technology Commercialization Program (NTCP), implemented the project, “Technology Piloting and



The final model of the coffee roasting machine PHOTO COURTESY OF CaVSU

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during the first phase of the project. From the nine peanut varieties, four came from ICRISAT, four from the national recommendation, and one farmer's variety. From the 10 pigeonpea varieties, nine came from ICRISAT and one from national/local check variety. The eight chickpea varieties all came from ICRISAT.

Based from the wet season trial for peanut, ICGV 00350 and ICGV 99046 resulted a yield of 1,594 kg/ha and 1,535 kg/ha, respectively. NSIC Pn 11(Namnama 1) got the highest yield of 1,620 kg/ha which is better compared with the farmer's variety that posted 1,298 kg/ha.

In the dry season trial, ICGV 99046 and ICGV 00350 still recorded a good yield of 1,944 kg/ha and 1,838 kg/ha, respectively. NSIC Pn 11 posted a yield of 1,870 kg/ha and the farmer's variety got 1,457 kg/ha. Out of the nine varieties tested, ICGV 00350, ICGV 99046, and NSIC Pn 11 were the consistent high-yielders.

The adaptability yield trials on pigeonpea were conducted in all project sites except in Region I. From the 10 pigeonpea varieties that were tested, only the four short duration varieties (ICPL 88034, ICPL 88039, ICPL 81, and ICPL 161) flowered and developed into pods in all locations. These produced a seed yield from 0.87 t/ha to 1.28 t/ha. There were varieties that performed well in one site but performed poorly in other sites and vice versa. These short duration pigeonpea varieties performed well in Regions V, VI, VII, and VIII; while the medium duration varieties: ICP 7035, ICPL 87051, ICPL 87091, and ICPL 87119 performed well in Regions VIII, IX and X.

All chickpea varieties showed promising results especially in Dalwangan, Malaybalay, Bukidnon.



groundnut



pigeonpea



chickpea

The BAR-ICRISAT collaborative project titled, "Field testing of ICRISAT legume varieties and technologies in selected regions of the Philippines," focuses on strengthening the RDE for groundnut, pigeonpea, and chickpea varieties. PHOTOS FROM ICRISAT WEBSITE

Phase II: On-farm adaptability trials

From November 2010 to April 2012, the Phase II of the project was implemented right after the on-station trials. Results of the Phase I were further verified through on-farm adaptability trials in the same seven regions. Promising peanut, pigeonpea, and chickpea varieties were distributed to chosen farmers.

For peanut, NSIC Pn 11 was still the highest seed yielder among the other two varieties during wet season trial wherein it posted 1,934 kg/ha. It was followed by ICGV 99046 which has 1,564 kg/ha and ICGV 00350 which has 1,444 kg/ha. During dry season, ICGV 99046 was the highest seed yielder with 1,440 kg/ha. It was followed by NSIC Pn 11 which has 1,385 kg/ha and ICGV 00350 which has 1,295 kg/ha.

Varied results were derived from the on-farm trials in the six regions of pigeonpea. ICPL 88034 has the highest seed yield at 976 kg/ha. It was also established that all varieties out-yielded the farmer's variety except in Region VIII wherein farmer's variety out-yielded the ICPL 88034.

Only Regions I, IX, and X conducted the on-station and on-farm trials for chickpea. It was observed in Region I that all chickpea varieties planted have high germination rate, however, as the crop reaches its reproductive stage, low pod setting and stunted growth were observed. Also, it was noted that chickpea varieties tested were sensitive to abrupt change in temperature that affects its growth.

Gearing up for the next phase

The third phase of the project is currently in progress which consists of on-station and on-farm seed productions. The seed production for chickpea is not being pursued in Phase III due to its unfavorable performance during the previous trials. Phase III focuses more on peanut and pigeonpea on-station and on-farm seed productions.

Aside from seed production, the inclusion of Region III (Central Luzon), IVA (CALABARZON) and XII (SOCCSKSARGEN), is one of the features of the new phase. These regions will also do an on-station and on-farm adaptability trials, and seed production of the three legume crops.

With this project, farmers who rely mostly on the income from planting major crops like rice and corn, can now have the opportunity to increase their profits by integrating legumes in their cropping system. Having the knowledge on the right technologies and varieties can further boost their livelihood. ### (Diana Rose A. de Leon)

Reference:

Graham, P.H. and Vance, C.P. (2003). Legumes: Importance and constraints to greater use. Plant Physiology, March 2003 Vol. 131 No. 3 872-877. Retrieved from <http://m.plantphysiol.org/content/131/3/872.full>



Media practitioners from Camarines Sur composed of members from the DA-Regional Agricultural and Fisheries Information Division (RAFID) of Regional Field Unit 5, as well as from the *Kapisanan ng mga Brodkaster ng Pilipinas* (KBP), in a photo opportunity with staff members from BAR. PHOTO:RBERNARDO

Cam Sur media practitioners visit BAR

The Regional Agricultural and Fisheries Information Division (RAFID) of the Department of Agriculture—Regional Field Unit 5 (DA-RFU-5), together with 30 members of the *Kapisanan ng mga Brodkaster ng Pilipinas* (KBP) in Camarines Sur, visited the Bureau of Agricultural Research (BAR) on 28 November 2013 as part of their capacity building and exposure trip.

The trip was part of RAFID and KBS' efforts to better understand and appreciate the recent developments in the agriculture and fisheries sectors particularly on the R&D thrusts of BAR.

Ms. Emily B. Bordado, chief of RAFID RFU 5, said that the activity is in coordination with the International Rice Research Institute (IRRI) and Philippine Rice Research Institute (PhilRice) as a follow through on a seminar conducted by the institutes on

rice and nutrition for media practitioners in Cam Sur, and is also in line with the Biotechnology Week. The three-day trip, which commenced on 27 November 2013, included a visit to DA-Central Office, Bureau of Soils and Water Management (BSWM), and the Philippine Information Agency (PIA). The group paid a courtesy call to DA Undersecretary Emerson Palad being the officer-in-charge of DA-Agricultural and Fisheries Information Division (AFID).

The group from the BAR-Applied Communication Division (ACD) welcomed and facilitated the event and likewise introduced the agency with the showing of an audio-visual presentation and highlighting the bureau's two banner programs, the Community-based Participatory Action Research (CPAR) and the National Technology Commercialization Program (NTCP), and other major R&D programs. After the short introduction, the discussion (question and answer) centered on the various interventions of BAR on crops particularly on *rimas*, *stevia*, among others. Focal persons and representatives from various divisions served as resource persons during the Q&A.

KBP Cam Sur President Chris Bersabe, on behalf of the group, acknowledged and thanked the bureau for the warm reception, while Ms. Bordado expressed her

appreciation to BAR's efforts in promoting R&D in the country as well as enhancing viable technologies that will increase production, enabling farmers and fisherfolk to be competitive. A group photo opportunity concluded the visit. ### (Patrick Raymund A. Lesaca)

BAR Director keynotes...from page 3

produce are made excellent and abundant, farmers can not only have a source of food, they can also make handicrafts as souvenirs for tourists, and even have a direct market for their produce which are sought by tourists. And with R&D, farmers are better equipped on how they can better optimize their yields and earn more. And eventually, turn their farms into agritourism sites where people can find new strategies and ideas both for farming and entrepreneurship," stressed Dir. Eleazar.

After his speech, the BAR director provided *sapinit* wines that were served during dinner in order to fully promote the product to the foreign delegates. Also part of the ISSAAS closing program was the oath taking ceremony wherein Director Eleazar took his oath as one of the new ISSAAS regular members. ### (Liza Angelica D. Barral)



RAFID RFU-5 Chief Emily Bordado (left), and KBP Cam Sur President Chris Bersabe (right), express their gratitude to BAR. PHOTOS:RBERNARDO

Eleazar visits BAR-supported...from page 1



BAR Director Eleazar visits the newly constructed/rehabilitated Post-Harvest and Food Processing Laboratory of the Lipa Agricultural Research Station (LAES) which is funded by BAR. It houses various fixtures and equipment that will enable LAES to fulfill its mandate of research, development, production, and extension for upland agricultural zones in CALABARZON.

PHOTOS: MVALDEABELLA

Mr. Anthony Obligado, OIC, BAR-Technology Commercialization Division (TCD) and STIARC Manager Digna Narvacan accompanied Dir. Eleazar in his visit.

The bureau chief also visited the Lipa Agricultural Research Station (LAES)-Post-Harvest and Food Processing Laboratory, another newly-constructed/rehabilitated BAR-funded R&D facility. Inside the facility are equipment purchased under the project that will enable LAES to conduct research, development, production, and extension for upland agricultural zones in CALABARZON.

Other BAR-supported R&D facilities visited was the STIARC Training Hall. Among the IDG support for this facility were: 1) improvement of the existing training hall, 2) expansion of the floor area, 3) improvement of the mini conference room, 4) upgrading of the audio-visual

equipment and fixtures, 5) construction of audio-visual control room, 6) construction of comfort rooms, and 7) installation of stand-by electric power generator. Dir. Eleazar also visited the DA-IVA Regional Soils Laboratory and Tissue Culture Laboratory.

As part of his regional visits, Dir. Eleazar makes it a point to monitor various BAR-funded R&D projects being implemented by the DA-RFUs. Among the R&D projects he visited were: 1) Technology Demonstration of Embryo-cultured Makapuno; 2) Field Testing of ICRISAT Peanut Varieties; 3) Development and Promotion of Adlai as an Alternative Staple Food in CALABARZON; and 4) Enhancement of Lipa-LGU Bee Program for Livelihood, Agricultural Productivity and Biodiversity Conservation. ###
(Mara Shyn M. Valdeabella)

Banana peduncle turns...from page 6

electrolyte levels.

"Samples of sports drinks in the market contain sodium and potassium ranging from 24.8 to 48.3 mg/100 mL and 11.7 to 19.5 mg/100 mL, respectively. Pure peduncle juice contained 455.2 and 425.8 mg/100 mL sodium and potassium levels, respectively, which were about 9-30 times higher than in the commercial sports drinks," as stated in the project report.

The peduncle juice was also used as a potassium supplement fertilizer in hydroponics that can improve the quality of salad vegetables such as lettuce, chives, and *arugula*. It was also found to be an effective liquid potassium fertilizer in banana and other high value commodities such as *pechay*, *kale*, *parsley*, *carrots*, *okra*, *eggplant*, and *tomato*. ###
(Leila Denisse E. Padilla)



(top) Dr. Mary Ann Tavanlar, researcher from BIOTECH-UPLB, discusses about the various products which can be developed using the banana peduncle. (below) She receives a plaque of appreciation from BAR Assistant Director Teodoro Solsoloy for being the resource speaker of the seminar series. PHOTOS: RBERNARDO

Pilot testings of legume varieties in 7 regions show promising results



Region I



Region V



Region VII



Region VIII



Region VI



Region IX



Region X

Project sites in the seven pilot regions which were tapped to implement the BAR-ICRISAT project in the Philippines. PHOTOS COURTESY OF THERNANDEZ and DA-RFUs

Legumes are important commodities that can help alleviate food insecurity worldwide. In fact, 27 percent of the world's major crop production is for legumes and provide 33 percent of the human dietary protein requirement (Graham and Vance, 2003). They can also enhance and improve soil fertility by its ability to fix nitrogen from the atmosphere.

In the Philippines, legumes are added in crop rotation to increase income and to rejuvenate the soil fertility after harvesting the major crops such as rice and corn.

The Bureau of Agricultural Research (BAR) collaborated with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) to diversify food production and to help improve the livelihood of farmers by growing appropriate legume varieties. This partnership was forged through the project titled, "Field testing of ICRISAT legume varieties and technologies in selected regions of the Philippines". The project focuses on strengthening the research, development and extension (RDE) for peanut, pigeonpea, and chickpea varieties.

Seven regions, through the Regional Field Units (RFUs) of the Department of Agriculture (DA), were

tapped to pilot and implement the project including Region I (Ilocos), V (Bicol), VI (Western Visayas), VII (Central Visayas), VIII (Eastern Visayas), IX (Zamboanga Peninsula), and X (Northern Mindanao).

Phase I: On-station adaptability trials

Implemented from April 2009 to November 2010, the Phase I of the project which are on-station adaptability trials started in various pilot sites. Nine peanut, 10 pigeonpea, and eight chickpea varieties were evaluated

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