

Adlay emerges as another important...from page 15

which are implemented by the DA regional field offices, state universities and colleges, Philippine Center for Postharvest Development and Mechanization, and University of Asia and the Pacific (UA&P).

In the program's effort to develop, promote, and utilize adlay to contribute to the country's bid to achieve national food security, adlay seeds are being increased for production, processing, distribution, promotion, and further research. Furthermore, various production technologies and recommended practices were developed which include adlay production techno guides, improved management practices, and value-added products. Postharvest mechanization was likewise developed that include a rice-thresher modified for adlay, and a micro-milling machine.

Another noteworthy accomplishment under the Adlay R&D Program is the rise of adlay champion products from the regions. *Gourmix*, developed by researchers from Cagayan Valley Research Center (CVRC) in Ilagan, Isabela, is a healthy food made up of adlay grits, turmeric, ginger, *malunggay* powder, ground mungbean, soybean, white corn grits, and rice. Currently, *Gourmix* is being used in various feeding programs of public and private groups. Other well-known adlay products include adlay breakfast cereal, wine, *polveron*, *puto*,

chamorado, and coffee, among others.

With these already available products, BAR commissioned UA&P to conduct a market research for adlay to determine its acceptability in the market, design appropriate product development, and come up with a marketing plan for both adlay grains and processed products. The highlights of the results showed that a high appreciation by potential buyers for adlay can be over 80 percent despite low public awareness on the commodity. Also, adlay got a positive nod from the respondents in terms of its processed products, such as adlay breakfast cereal and *Gourmix*, underlining its nutritive properties. According to a chemical analysis released by the Food and Nutrition Research Institute (FNRI) in 2011, adlay is superior in terms of its food energy content (365 kcal), carbohydrate content (73.9 g), protein (12.8 g), and fat (1.0 g) compared to rice and corn.

At present, the Adlay R&D Program is continuously working towards the expansion of production heeding its commitment to stabilize staple food supply and market prices. Revealing its numerous potentials through R&D, BAR hopes to encourage and sustain productivity to ensure self-sufficiency in healthy staple food for all Filipinos. ###

BAR participates in CPAR...from page 6



BAR-PMED Head Salvacion Ritual expresses her gratitude to the stakeholders present during the farmers' field day, especially to the farmers, for their efforts in implementing the CPAR project. PHOTO:DBATTAD

atis farming in Lobo. The decline in the production of *atis* in the last few years was attributed to the lack of proper pest management. It was during the participatory rural appraisal (PRA) that the project team, along with the 20 farmer-cooperators, established a rather simple solution to the mealy bug infestation.

"CPAR will not only introduce a technology, but in the case of this project, CPAR taught us, especially the *atis* farmers, to unlearn ineffective farming measures that caused low productivity for quite some time," Ms. Manalo pointed out. Since the project's implementation, farmers were able to experience a significant increase in their yield and income. ### (Daryl Lou A. Battad)



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CPAR in Davao City to rehabilitate cacao trees for enhanced production

Cacao production and processing remains to be a lucrative agribusiness venture, especially with the continuing rise in demand for cocoa products in the international and domestic markets. This is where Mindanao finds its advantage. In fact, Mindanao is the lead cacao producer in the country, producing 90 percent of the total volume of cacao production. However, there is still room for growth for the Mindanao cacao industry, especially on the production aspect.

The Department of Agriculture-Regional Field Office 11 (DA-RFO 11) launched the project, "Community-based Participatory Action Research (CPAR) on the Improvement of Cacao Production in Brgy. Sirib and Brgy. Subasta in Calinan District, Davao City" on 29 July 2016. The CPAR project aims to encourage cacao growers to adopt enhanced technologies on cacao production that are suitable to the agricultural conditions of cacao-growing areas to increase production. CPAR is one of the banner programs of the Bureau of Agricultural Research (BAR).

The Calinan District is the agricultural production hub of Davao City with cacao, durian, and banana as its main commodities. Sirib and Subasta are the two barangays of Calinan District with the largest land areas dedicated to cacao and have the largest numbers of cacao growers. However, the potentials of cacao production in these two areas are not yet optimized due to unsound cultural management practices

brought about by limited knowledge and technologies available on cacao production.

With this, the CPAR project will bring in interventions that will fit the needs of these cacao areas. Using a participatory approach, the interventions will be based not only on the observations of the project implementers, but will also include suggestions of the cacao growers as well. The project will focus on the rehabilitation of old cacao trees, and the

The project implementers partnered with several cooperatives in Sirib and Subasta, namely: Lower Sirib Farmers Multipurpose Cooperative (LSFMPC), Sirib Active Group of Individual Growers Cooperative (SAGING Coop), Sirib Multipurpose Cooperative (SMPC), and Subasta Integrated Farmers Multipurpose Cooperative (SIFMPC).

Mr. Jose Calago, member of

turn to page 5



Under the CPAR project, farmer-beneficiaries from various farmers' associations in Calinan District, Davao City receive cacao farming inputs and machineries. PHOTO:DDELEON

introduction of packages of technologies (POT) on cultural management, and pest and disease management, among others.

The priority of the CPAR project will be the rehabilitation of old and unproductive cacao trees (30 years of age) in the two barangays. According to reports, about 20 percent of the cacao trees in the areas need rehabilitation, and if done and accompanied by improved cultural management practices, the project is projected to increase cacao production by 10 percent for each farmer-cooperator.

IN THIS ISSUE...

CPAR in Davao city to rehabilitate	1
BAR reinforces CPAR	2
2016 Gawad Saka Search	3
BAR-supported book on goat	4
BAR attends BPI La Granja	5
BAR participates in CPAR Farmers'	6
Herbs and spices, small hive	7
Improving livelihood in Cagayan	8
Developing meat products	10
Nipa palm sugar brings economic	12
Adlay emerges as another important	15



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Professor Lody Padilla-Espenido (standing), one of the resource speakers



BAR Director Nicomedes P. Eleazar delivering his welcome remarks and opening message

BAR reinforces CPAR through community organizing workshop

Recognizing the importance of people's collective action in an organized structure in sustaining government programs and projects, especially those that are geared towards community development, the Bureau of Agricultural Research (BAR) organized the first leg of a "Seminar Workshop on Community Organizing" on 5-7 July 2016 at the BAR Conference Hall, Diliman, Quezon City.

The activity was conceptualized to further strengthen the implementation of the Community-based Participatory Action Research (CPAR), a banner program of BAR. As the success of CPAR implementation relies heavily on the harmonious working relationship among its stakeholders, community organizing is seen as a

viable strategy and a tool to elicit active participation and cooperation among farmer and fisher cooperators, establish and strengthen a formal structure of collaborations (e.g. farmers' association), and forge partnership among other groups.

Gracing the activity was BAR Director Nicomedes P. Eleazar. In his opening message, he shared that CPAR was initiated with the foremost goal of attaining development of farming and fishing communities in the country. He emphasized that for this to be attainable, farmer and fishing groups should be put at the helm of implementation. This is why one of the criteria of CPAR is tapping organized groups as cooperators of CPAR projects.

Professor Lody Padilla-Espenido of the College of Social

Work and Community Development, University of the Philippines Diliman; and Dr. Blesilda Calub of the College of Agriculture, University of the Philippines Los Baños served as resource speakers in the three-day workshop.

"People work individually," said Prof. Espenido in her introductory lecture on community organizing. Basing on her engagements with various institutions as a community organizer, she reiterated that the individualistic and passive attitude of Filipinos can be turned into something more dynamic and participatory by community organizing, giving emphasis on the significance of collective actions towards attainment of specific goals. For the case of smallhold farmers and fisherfolk, their goal is to have a better life through productive, profitable, and

turn to next page



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ADLAY emerges as another important health-promoting food staple

by Daryl Lou A. Battad

An effort towards better appreciation for adlay as a traditional food staple in the country, alongside rice and corn, was set in motion in 2010, when the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA) developed a research and development (R&D) program to explore the potentials of adlay.

Pioneering this initiative, BAR presented a breakthrough in adlay R&D in 2011 by establishing adaptability yield trials (AYT) in selected regions across the country. This was carried out through collaborative partnerships with various government and non-government organizations. By 2014, the AYT's were successfully accomplished by all regions following full cropping cycles, generating significant results from cultivation, nutrient composition, to production and post-production management practices which are central to the crop's promotion as another high-value commodity.

What is adlay?

Unknown to many, adlay has been around for centuries particularly in some parts of Southern and Eastern Asia. In the Philippines, it has been growing abundantly in Zamboanga Peninsula. In fact, it is a staple food for the *Subanens*, a group of indigenous people in Zamboanga del Sur.

Adlay is an indigenous crop that comes from the family Poaceae or the grasses, where wheat, corn, and rice also belong. It is often referred to as "Job's tears" as its grains resemble a tear-like shape.

Adlay, scientifically known as *Coix lacryma-jobi* L., is an indigenous crop that comes from the family *Poaceae* or the grasses, where wheat, corn, and rice also belong. It is often referred to as "Job's tears" as its grains resemble a tear-like shape.

A tall, grain-bearing tropical plant, its stem grows from 3 to nearly 10 feet tall, with sword-shaped leaves. Grains are usually harvested 5-6 months after sowing, which can thrive for two cropping seasons both wet and dry.

The AYT results show that adlay performs best in higher elevations, but can also thrive in lower elevations preferably during the wet season. It can be planted as hedgerows and can also be intercropped with fruit trees and plantation crops such as coconut, banana, citrus, mango, and coffee. Although adlay is resistant to pests and diseases and can be grown as a pesticide-free crop, it responds well to organic fertilizers. *Pulot*, *gulian*, *tapul*, and *ginampay* are the four known local varieties of adlay.

Adlay R&D

Following the success of the yield trials, BAR has been supporting a total of 51 projects as of February 2015 under the Adlay R&D Program,

turn to next page

Herbs and spices, small hive...from page 7

of varying strengths as a solvent to extract the active principles from crude drug materials.

Rufo ended her discussion by charting out the expenses and returns of investment (ROI) of two distinct ventures involving herbs and spices. In making and selling homemade herbal cream, one can spend as much as Php 1,289 and still generate an income of Php 1,800 thereby resulting in a 40 percent ROI. According to Rufo, just growing and selling herbal plants results to a 35 percent ROI.

Following Professor Rufo's discussion was a seminar talk on the growing threat to apiaries in Mindanao: small hive beetles (SHB). According to Dr. Cleofas R. Cervancia, professor of entomology at the University of the Philippines Los Baños (UPLB), SHB larvae eat everything in the colony, whether it be brood, honey, pollen, or the comb. SHB would then defecate inside the hive, causing their waste to ferment with the honey leaving the substance with an unwanted odor rendering it no longer edible. SHB would lay their eggs inside the hive, and when the pests reach their larval stage, they will begin to burrow through the hive eating anything on its path.

According to Dr. Cervancia, these critters most probably made their way to the Philippines from bee hives imported from Australia in 2014. For now, Apimondia, the International Federation of Beekeepers' Associations, has tracked infestations of the pest in three areas in South-East Mindanao, namely: General Santos, Lupon, and Panabo. Aside from promoting widespread adaptation of beekeeping across the Philippines, UPLB and Apimondia have also continually pushed their advocacy for stricter importation laws and regulation as it is the key to eliminating the spread of SHB in the country. With the help of Cervancia's colleagues in Australia, SHB traps were sent to the Philippines for dissemination among apiaries.

Cervancia concluded her talk by presenting methods that help prevent infestation of bee hives by



SLSU-JGE Professor Veronica Aurea Rufo (left) and Instructor Dorris N. Gatus (right) talk about their project on herbs and spices.



Various herbs and spices grown in a demo farm in Quezon from an SLSU-JGE-led project



UPLB Professor Cleofas Cervancia discusses about the small hive beetles.



Adult small hive beetles

SHB. Most crucial is the maintenance of healthy bee colonies. According to the retired UPLB professor, at least 80 percent of the frames must be covered with bees for colonies to be resistant to SHB. It is also important to know the hiding places of SHB which are

usually in the propolis, burr combs, and empty frames. SHB also hides in bottom boards and feeders where they feed on dead bees and pollen which are why these boards need to be frequently cleaned. ### (Ephraim John J. Gestupa)



Dr. Blesilda Calub (right), one of the resource speakers

sustainable farming and fishing. She added that CPAR is the vehicle, and the bridge, to make this 'change for the better' possible.

She gave a comprehensive discussion on the major phases of the community organizing process, which are: 1) social preparation, 2) leadership development and capacity building, 3) organizational development and management, 4) consolidation and expansion, and 5) networking and building relationships. She mentioned that it is important for CPAR implementers to assess what stage/level the organizing work has been done with the farmers' groups that will be tapped on the CPAR project so that they can include activities that will support the growth of the group. She also discussed the important concepts and strategies on sustainable livelihood, social enterprise development, and project development.

The participatory nature of CPAR projects requires its implementers to use tools and strategies that will invoke the participation of its stakeholders. This was highlighted by Dr. Calub during her discussion on Participatory Rural Appraisal (PRA). Based on the definition given by Dr. Calub, PRA is "an active process of joint dialogues, sharing and analyzing situations to attain consensus towards action and change." To assess the extent of knowledge of the participants on PRA and make the participants have a feel on what are some of participatory tools that can be utilized, she used visual aids, peer discussions, and reporting. As a group, they were able to come up with a common understanding of PRA and what are its major components and processes.

The event was organized by the Project Monitoring and Evaluation Division of BAR and was attended by



The National Technical Committee (NTC) for this year's search for Gawad Saka Outstanding Agricultural Scientist (OAS) and Researcher (OAR) discussing each nominee's works for both categories during the desk evaluation. PHOTO: ABRION

2016 Gawad Saka Search for OAS, OAR desk evaluation held

The desk evaluation for this year's search for Gawad Saka Outstanding Agricultural Scientist (OAS) and Researcher (OAR) was held on 5-6 July 2016 at the University of the Philippines Los Baños (UPLB), College, Laguna. Pertinent documents and other related requirements submitted by nominees were assessed by the National Technical Committee (NTC) composed of experts in agriculture-related fields who served as evaluators for each category.

Present during the desk evaluation were NTC members for the OAS: Dr. Roberto Rañola, Jr. (UPLB), Dr. Edralina Serrano (UPLB), and Dr. Jonar Yago (Nueva Vizcaya State University); while Dr. Enrico Supangco (UPLB), Dr. Jose Hernandez (UPLB), and Dr. Elda Esguerra (UPLB) for the OAR. Joining them were BAR officials, Assistant Director Teodoro Solsoloy, vice chairperson for both categories; IDD Head Digna Sandoval; and staff members who served as coordinators and secretariat.

The team discussed and finalized the initial evaluation of the nominees, examining the

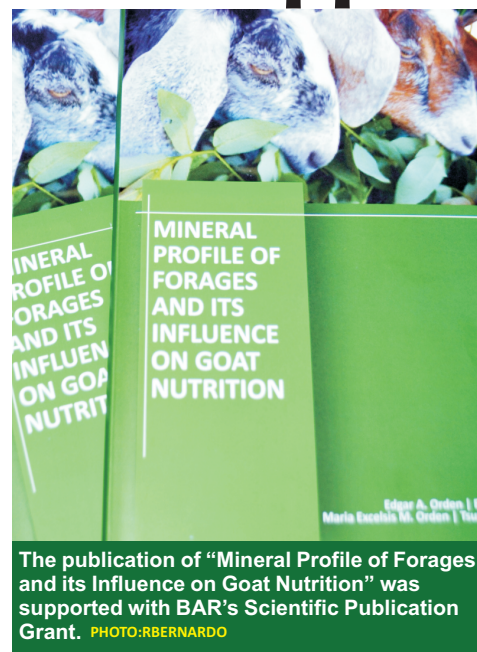
scientists' and researchers' quality of work and productivity. Likewise, the schedule of activities for the series of intensive field validation for the shortlisted nominees was also laid down. These activities will be conducted to validate the accuracy of the information presented in the nominees' documents.

The Gawad Saka Search for OAS and OAR is an annual activity of the Department of Agriculture (DA) which is coordinated by the Bureau of Agricultural Research through the Institutional Development Division. It gives due recognition to scientists and researchers for their significant contributions to the agriculture and fisheries sector. Nominees for the OAR are recommended by DA Regional Executive Directors; BFAR Regional Directors; heads of DA attached agencies and staff bureaus, state universities and colleges (SUCs), and other private research institutions. Meanwhile, heads of government or private research institutions, SUCs, and professional organizations/associations and societies can recommend nominees for the OAS. ### (Anne Camille B. Brion)

the CPAR Technical Working Group, selected BAR staff members, and regional CPAR Management Teams from CAR, regions 1, 2, and 3.

Similar seminars will be arranged in the future to cover all regions in the country. ### (Diana Rose A. de Leon)

BAR-supported book on goat nutrition wins NAST PHL award



The publication of "Mineral Profile of Forages and its Influence on Goat Nutrition" was supported with BAR's Scientific Publication Grant. PHOTO:RBERNARDO

The book, "Mineral Profile of Forages and its Influence on Goat Nutrition," was among the seven publications that bagged the 2016 Outstanding Book Award given by the National Academy of Science and Technology, Philippines (NAST PHL) during the 38th Annual Scientific Meeting held on 14 July 2016 at the Manila Hotel, Ermita, Manila.

Funded by the Bureau of Agricultural Research (BAR) through its Scientific Publication Grant, the book provides important scientific information and significant findings that will contribute to achieving better performance and overall productivity of goats. These include information on common forages, mineral contents of selected forages, distribution and solubility of minerals in forages, and feeding options to improve mineral status, among many others.

"With more than 25 years of research undertakings, we have generated substantial information on the mineral contents of forages and mineral nutrition of goats in the country. Although we have published in local and international journal articles, we feel the need to come up with a book for wider readership such as among people working in research and development, especially those



Receiving the NAST award are authors (L-R) Dr. Edgar A. Orden, Dr. Tsutomu Fujihara, Dr. Maria Excelsis M. Orden, and Dr. Emilio M. Cruz. PHOTO COURTESY OF EORDEN/CLSU

involved in improving the nutritional status of goats, goat raisers, animal science students, and individuals interested in goat raising," said Dr. Edgar A. Orden, one of the authors from Central Luzon State University (CLSU).

Dr. Orden and the other book authors, Dr. Emilio M. Cruz, Dr. Maria Excelsis M. Orden, and Dr. Tsutomu Fujihara, were very thankful for the NAST recognition and for giving importance to the book, specifically in the field of agricultural science. "It is a fitting recognition of our efforts & hard work in preparing the manuscript of this book. We have waited for more than two decades to come up with it. We wish to thank our partners, BAR for funding the publication of the book, CLSU administration for their support while

we are organizing, conducting workshops, and preparing the final draft, and to all those who helped us in this endeavor," he added.

Annually, NAST gives recognition to books and/or monographs written by Filipino authors and published in the Philippines that are adjudged to be outstanding in the fields of agricultural sciences; biological sciences; chemical, mathematical, and physical sciences; engineering sciences and technology; health sciences; and social sciences. Books and/or monographs are judged based on the quality and originality of content, contribution to science and technology, clarity of presentation, and thoroughness of documentation. ### (Anne Camille B. Brion)

“With more than 25 years of research undertakings, we have generated substantial information on the mineral contents of forages and mineral nutrition of goats in the country.”

with sanitation concerns involved in making sugar out of nipa sap, but thanks to the training and field trips to accredited processing facilities, SIWA members were made aware of these concerns which ultimately expedited their efforts to develop the quality of their nipa palm sugar.

According to John Largo, officer-in-charge of the Municipal Environment and Natural Resources Office of Lanuza, not only did the project help in increasing the farmer's source of income, but it also elevated their awareness of climate change. Ever since becoming beneficiaries of FREEDOM's project, members of SIWA became more involved in the LGU's activities aimed at protecting the environment such as tree planting projects and awareness campaigns during town festivals. This level of enthusiasm is significant for Largo's municipality since the town is in close proximity to hectares of large-scale mining sites.

Mangrove forests with nipa palm help in preserving the diversity of marine life. "Nipa palm is a climate resilient plant," says Peralta as he explained the sustainability of FREEDOM's project. In cases of agricultural damage and flooding caused by a typhoon, nipa entails

very short recovery time because of the plant's invasive growth. According to Largo, this is nipa palm's edge compared to rice and corn plantations that are left completely devastated after a storm's beating. Having healthy nipa palm plantations along coastal towns also protects towns from storm surges as the mangrove forests serve as a natural buffer. Since nipa palm just naturally grows in Lanuza, farmers do not need to apply fertilizer at all. This was key to SIWA's efforts to marketing their product as organic nipa palm sugar.

It has been FREEDOM's goal to conduct research that promotes holistic and sustainable growth among stakeholders. When developing innovative, market-driven products, they consider how communities can be uplifted to higher economic activity and also how the environment can be further preserved and protected.

Today, FREEDOM and SIWA are in the next phase of the project which involves expanding plantation areas, and nipa palm sugar and wine processing facilities across Surigao del Sur while simultaneously securing the needed accreditations for both Azucar de Lanuza and its processing facilities.



Harvested nipa palm sap used in the production of sugar. PHOTO:EGESTUPA

It is both Lanuza and FREEDOM's goal that nipa palm sugar would soon not only penetrate the local market, but also be exported internationally. ###

For more information, contact: **Antonio S. Peralta**
Executive Director
FREEDOM, Inc.
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Through the project on nipa palm, SIWA members were trained on the proper methods of tapping nipa sap and processing nipa palm sugar, taught on the basics of organizational and financial management, and equipped with machinery and equipment needed for sugar production.

NIPA PALM SUGAR

brings economic, environmental development to Surigao del Sur community

by Ephraim John J. Gestupa

Antonio S. Peralta and his team were not expecting the amount of attention their product would soon be receiving during last year's Agriculture and Fisheries Technology Forum and Product Exhibition held at SM Megamall in Mandaluyong City. One moment they were manning their booth answering questions about Lanuza's Nipa Palm Sugar, the next they were being called onstage to receive the Best Product Award. "We did not even anticipate being there. We were not fully aware that we were being interviewed, and much more to our surprise that we would then be called onstage for the best product award. It was so surreal that even the people I was with at the Lanuza booth were looking at one another and they said, 'Is this thing really for real?'"

The recognition may not have been expected, but Peralta's product truly deserved bagging the first place. Nipa Palm Sugar, also known as Azúcar de Lanuza, is the product of years of research done by Peralta's nongovernment organization, Foundation for Rural Enterprise and Ecology Development of Mindanao (FREEDOM), Inc., in partnership with the Department of Agriculture-Bureau of Agricultural Research and Lanuza's Municipal Office. With Peralta serving as its Executive Director, FREEDOM turned into reality an industry in Surigao del Sur that is based on the nipa palm, a plant native to the coastline and estuarine habitats of Pacific and Indian ocean countries. Today, communities in Lanuza are developing and producing wine, brandy, and sugar from the sap of nipa palm with the help of the municipal government and FREEDOM.



Nipa palm sugar PHOTO:RDELACRUZ

Nipa is a palm that has leaves similar to that of the coconut tree's but grows much shorter than the latter. It is a major component of the mangrove forests in South and Southeast Asia. Nipa palm exhibits a wide array of useful properties. Its leaves have been used to make hats and roofing material. Edible products developed from the sap of nipa palm, such as sugar, have an extremely low glycemic index, making it a perfect alternative to regular sugar for anyone suffering from diabetes. Nipa palm sugar also contains minerals such as potassium, phosphorus, nitrogen, magnesium, iron, zinc, and vitamins B1, B2, B3, and B6. Despite being a plant of many uses, there has been little development in promoting research and funding for the utilization of nipa palm in the Philippines.

Considering the strategic position of the Philippines as the country with the third largest area of nipa palm plantations in Southeast Asia, Peralta, along with his colleagues in FREEDOM, set out to take greater strides in expanding the selection of locally-made, world-class, nipa palm-based, products.

They embarked on the BAR-funded project titled, "Adoption and Utilization of Nipa Palm Sugar Processing Technology in Lanuza, Surigao Del Sur." Partnering with BAR and FREEDOM were the Municipal Office of Lanuza and Sitio Ipil Wine Makers Association (SIWA).

Before FREEDOM's research, farmers in Barangay Aksam, Lanuza depended on nipa wine making, and rice and corn farming as their sources of income. With the help of the BAR-funded project, their income significantly increased. Members of SIWA were trained, not only on the proper methods of tapping nipa sap and processing nipa palm sugar, but were also taught the basics of organizational and financial management. SIWA was also equipped with machinery and equipment needed to properly harvest and process the tree sap for sugar production. According to Fritz Escudero of FREEDOM, prior to the project, farmers were not particular

BAR attends BPI La Granja Field Day



Field day guided tour PHOTO:RDELACRUZ

More than 300 farmers and guests attended the "2016 Field Day" at the Bureau of Plant Industry (BPI)-La Granja National Crop Research, Development and Production Support Center (LGNCRDPC) on 21-22 July 2016 in La Carlota City, Negros Occidental. As one of its partners in research and development (R&D), the Bureau of Agricultural Research (BAR), represented by Ms. Marnelie G. Subong of the Project Monitoring and Evaluation Division (PMED) and Ms. Rita T. dela Cruz of the Applied Communication Division (ACD), attended the two-day event.

Ms. Milagros B. Abaquita, chief of BPI-LGNCRDPC, in her message to the participants, mentioned the importance of showcasing technologies through a field day to keep the farming sector updated, particularly on the specific programs of the government that can help the farmers improve their production and income. She added that, aside from keeping the public aware of the available technologies, conducting field days is also their way of disseminating what services the farmers can avail of, thus empowering them to produce and earn more.

Highlights of the first day included a guided field tour for the farmers and guests at the eight-hectare seed production area of BPI

La Granja featuring technologies on organic and Good Agricultural Practices (GAP). Included in the field tour were field visits to the BAR-funded project, "Soybean Crop and Improvement, and Organic Soybean Seed Production." There were also two simultaneous Organic Technology seminars featuring topics on: 1) plant propagation and vermi composting, and 2) Naturally Fermented Solution (NFS) production and herbs and spices propagation. Mr. Yondre J. Yonder, chief of BPI National Mango Research and Development Center (NMRDC) in Guimaras, held an orientation seminar on the GAP Program. A farmers' dialogue and forum followed after technology clinics provided by BAR, Bureau of Soils and Water Management, BPI, and Philippine Carabao Center. Providing the audience with information on the various programs and services of BAR was Ms. Subong who highlighted the two banner programs of the bureau: Community-based Participatory Action Research and National Technology Commercialization Program.

The second day featured a training seminar on mushroom culture and production. Ms. Mary Ann B. Guerrero of the BPI Crop Culture and Management Section, served as the resource speaker for the training seminar.

Meanwhile, the BAR staff took the opportunity to monitor two

BAR-funded research projects being implemented by BPI La Granja. These are: 1) efficacy of botanical extracts for the control of fungal diseases; and 2) performance evaluation of World Vegetable Center (AVRDC) and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) field legumes. The group also visited projects funded with Institutional Development Grants under the R&D Facilities Development Program of the bureau. ### (Rita T. dela Cruz)

CPAR in Davao City...from page 1

SAGING Coop, expressed his hopes that through the project, they will learn the appropriate technologies on cacao production and will experience the benefits of multiple commodity harvests through intercropping. Cacao can be intercropped with other crops such as coconut, lanzones, durian, and pummelo, among others.

The project likewise hopes to contribute to the achievement of 100,000 metric tons of cacao beans per year by 2020 which is the challenge posed by the DA to cacao-growing regions, especially to Davao Region which produced 88 percent of the total Mindanao cacao production in 2013. ### (Diana Rose A. de Leon)

BAR participates in CPAR Farmers' Field Day on sugar apple production



Farmers having a look at *atis* trees during the CPAR Field Day. PHOTOS COURTESY OF DA-RFO4A-STIARC

A *tis* farmers, Lobo local government units, Department of Agriculture-Regional Field Office 4A researchers and extension workers, and DA-Bureau of Agricultural Research (BAR) representatives convened in the farmers' field day at Barangay Balatbat, Lobo, Batangas on 19 July 2016 to witness firsthand and celebrate the success of the Community-based Participatory Action Research (CPAR) project on sugar apple (*atis*) production.

Implemented by the Southern Tagalog Integrated Agricultural Research Center (STIARC) with funding support from BAR, the CPAR Farmers' Field Day is an integral part of a CPAR project because it is where the introduced technology through CPAR is demonstrated to prepare farming communities for specific agricultural techniques that may be most beneficial in terms of production and income generation.

With roughly around a hundred people in attendance, the said activity enabled the participants to see the possibilities for more profitable production of *atis*, which can further strengthen and promote the municipality of Lobo as the "Atis Capital of the Philippines," which was officially declared back in 2011.

Ms. Salvacion Ritual, chief of the Project Monitoring and Evaluation Division (PMED) of BAR, joined the activity representing BAR Director Nicomedes P. Eleazar. In her message, she extended the bureau's appreciation to STIARC as it earnestly upholds a fundamental aspect of the CPAR program relating to technology demonstration and dissemination. "Ngayong mayroon na kayong napatunayang magandang teknolohiya, we expect na kayo naman po ang magsisilbing "farmer-trainers" sa iba pang mga

magsasaka dito na nais ring i-adopt ang technology na ibinahagi sa inyo. Ito talaga ang layunin ng CPAR: ang mag-demonstrate ng package of technology or POT, test it, and once proven effective, ay i-share din natin sa kapwa natin magsasaka para sila rin ay makinabang tulad ninyo. Sa pagkakataong ito, kayong mga farmer-cooperators ng CPAR project ang magsisilbing "trainers" sa iba. Syempre, nariyan pa rin ang suporta ng DA-RFO at LGU," Ms. Ritual said.

She also thanked the evident support of the LGUs, recognizing the presence of Lobo Municipal Mayor, Hon. Gaudioso Manalo, along with Balatbat Barangay Captain, Mr. Orlando Arias.

According to the project leader, Ms. Daisynette Manalo, CPAR became an effective means to determine the limiting factors and provide adequate solutions to boost

turn to page 16

Meat processing of organically-grown native animals can cater to a niche market which is willing to pay a higher price for the benefit of healthy products.

Application of new seasoning and combination of meat ingredients coupled with good handling practices will result to preservation, unique flavor, and good form of the meat. These value adding and product development techniques will lessen meat wastage, maximize its potential in terms of market acceptability, and increase availability of the product to the majority of consumers.

The development of processed meat products from organically-grown native pig and native chicken using different combinations of organically-grown herbs and spices were also conducted. The meat products developed from native pigs were as follows: 1) wet, sundried and smoked *tapa*; 2) burger; 3) *tocino*; and 4) *siomai*. For native chicken, these were: 1) roasted chicken; 2) *siomai*; and 3) *tocino*. Development of other products such as *lechon* belly, smoked ham, and others are still on-going.

The project proponents said that through meat processing, they will be able to reach the niche market which is willing to pay a higher price

for the benefit of healthy products. The packaging, ingredients used, product analysis, and shelf life will be part of the product development. Furthermore, when the production and value adding processes have been standardized, the developed technology will be transferred to beneficiaries for adoption.

The project is being conducted in collaboration with Dr. Cristy Bueno from the University of the Philippines Los Baños-Meat Processing Division; Mr. Dennis Bihis, researcher from the DA-RFO 4A-Quezon Agricultural Research Experiment Station; and Dr. Rene Santiago, center chief of the National Swine and Poultry Research and Development Center located at Brgy. Lagalag, Tiaong, Quezon.

Native pigs can be found in many parts of the country including Quezon, Marinduque, Abra, Kalinga, Mt. Province, Iloilo, and Davao, mostly in far-flung villages or barangays. Native chicken breeds originate from the provinces of Batangas, Pangasinan, Camarines

Sur, and Palawan. Native pigs and chickens are known for their ability to grow and reproduce even under adverse conditions, as well as tolerate heat and cold environments better than imported ones. Native pigs are also more resistant to parasites and common diseases as compared to the commercial or imported breeds. Since raising native pigs and chickens need small capital investment, and only require low-cost production inputs in terms of housing and feeding, they are popular among small-scale farmers.

The ideal mature weight for native pigs ready for meat processing is between 30 to 50 kilograms, while 10 to 30 kilos is the ideal weight for *lechon*. *Indigofera*, *Trichanthera*, and *Arachis pinto* are all species of flowering plants widely distributed throughout the tropical and subtropical regions of the world and can be given as feed materials to pigs and chickens. ###

Tocino and burger patties from native pig. PHOTO COURTESY OF DA-RFO4A-STIARC



Reference:

Faylon, W., et al. (2015). Project feasibility and progress report, *Technology Development and Commercialization of Production System and Meat Processing from Organically-Grown Native Pig and Native Chicken*.

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PHOTO:PLESACA



Developing meat products from ORGANIC NATIVE PIG AND CHICKEN

by Patrick Raymund A. Lesaca

The Philippine native pig and native chicken industries are already known as having a bright future. These animals have been with us for centuries and thus have already adapted to our local environment for survival. Another distinct advantage of native animals is that they are the preference among the increasing number of health-conscious consumers as they are low in fat. In the following years, we can expect more from these animals provided that government interventions on sustainability, conservation, and technologies on value-added meat products are in place.

To promote native pig, being the primary source of *lechon*; and native chicken, as healthier meat alternatives, a group of researchers from the Department of Agriculture-Regional Field Office 4A (DA-RFO 4A)-Southern Tagalog Integrated Agricultural Research Center (STIARC) ventured into raising organically-grown native pig and native chicken, and developing meat processing and preservation techniques.

In a research study conducted by Mr. Wilmer S. Faylon of the DA-STIARC, lead proponent of the DA-Bureau of Agricultural Research

(BAR) funded and supported project, "Technology Development and Commercialization of Production System and Meat Processing from Organically-Grown Native Pig and Native Chicken," he discovered ways to sustainably produce these animals and to process them for home and commercial consumption.

The objective of the study is to increase the income of animal raisers by at least 15 percent through commercialization of developed technologies for the production and meat processing of organically-grown native pig and native chicken.

Native animal production and meat processing

Part of the project was the establishment of 200 and 300 square meter paddocks demo farm native pig and native chicken, respectively. Twenty native pigs and 120 chickens were reared for 10 months. Native pigs were fed with *gabing San Fernando* (*Yautia* sp), cassava, *Trichantera*, and other fruits and vegetables. Native chickens were also fed with *Trichantera*, as well as *Indigofera*, *ipil-ipil* (*Leucaena glauca* L.), and *Arachis pintoi*. Over-ripe fruits, vegetables, and organic corn grains were also given for

supplementation. A 100-square meter nursery for growing selected and essential organic herbs and spices like basil, oregano, Chinese celery, lemongrass, tarragon, black pepper, ginger, sesame seeds, and rosemary, among others, were likewise set up and organically maintained in the station. No commercial feeds were given.

According to Mr. Faylon, once these animals reach their ideal weight, they are ready for meat processing. He added that the use of organic herbs and spices rather than synthetic chemical ingredients will highlight the distinct flavor and taste, and the nutritive value of the product making it appealing to the health-conscious consumer. These were used to marinate the meat either by dipping or rolling the raw product in it for a longer period of time since marinated meat enhances the flavor and texture of the meat products.

The project proponents were also able to develop an effective preservation technique. Faylon said meat must be fresh from the start of the processing.

turn to next page

Herbs and spices, small hive beetles featured in BAR seminars



PHOTO:JMCONSTANTINO

The Bureau of Agricultural Research (BAR) conducted its monthly in-house seminars on 27 July 2016 with a record-breaking turnout of almost 200 participants. This month's seminars focused on discussions about herbs and spices, as well as small hive beetles that adversely affect bees.

Professor Veronica Aurea A. Rufo and Instructor Dorris N. Gatus from the College of Agriculture of Southern Luzon State University-Judge Guillermo Eleazar talked about the research project titled, "Production, Processing, and Marketing of Herbs and Spices." Prof. Rufo recounted the project's beginnings when Dr. Estela Taño of Green Rescue Organic Association, Inc. came to Tagkawayan, Quezon and noticed the numerous herbs and spices growing wildly around the campus.

Herbs and spices exhibit a lot of advantages for their utilization. Aside from the fact that herbs need only minimal water for maintenance, Professor Rufo also pointed out how

herbs can serve as alternatives to various everyday necessities. Herbs and spices help preserve food and can also naturally enhance the taste of home-cooked meals. Such can be said for herbs such as oregano and lemongrass. Rufo also said that herbs and spices could serve as safer substitutes for pharmaceuticals. Unlike synthetic drugs, herbs do not result in unwanted side effects that come with the former. One example is *ashitaba*, an herb taken in by people with hypertension in portions of three leaves a day in the morning. *Ashitaba* exhibits anti-cancer properties as well. Herbs and spices are also useful as inexpensive air fresheners and deodorizers. Rufo said that, as the school librarian, she would place citronella leaves in between books to keep cockroaches from thriving on top of the shelves. According to Rufo, dried citronella leaves can be placed on burning charcoal to produce friendly smoke similar to the mosquito coil (katol) to keep mosquitoes away. Rufo pointed

out that SLSU makes use of herbs to make creams, ointments, soaps, oils, teas, and tinctures.

Highlighting the importance of the preservation of available herbs and spices for future generations, Rufo also talked about the right way of harvesting herbs and spices. According to the SLSU professor, underground plant parts are best collected when their leaves begin to shed off, while leaves and stem parts can be harvested when the plant is at its most luxuriant, most dense growth. Rufo also reminded home gardeners to harvest plants on a rotational basis, giving herbs enough time to recover and grow.

Rufo also differentiated specific methods for extracting juices from herbs. Decoction is done when an herb is boiled for its juice, while infusion is done by soaking the herb/s in water for an extended period. Tincture, on the other hand, utilizes ethyl alcohol

turn to page 14

Some of the cacao-based food products developed by ISU-Echague Campus include (top to bottom): 3-in-1 complete chocolate mix (in pouch), cacao tablea, 80 percent dark chocolate (in pouch), and 80 percent dark chocolates.



Improving livelihood in Cagayan Valley through cacao-based products

Story and photos by Patrick Raymund A. Lesaca

Processing cacao is recognized as having an important role in improving a cacao farmer's productivity, providing better nutrition, and improving cacao products for the domestic and global markets. Thus, it is a great challenge for academicians and researchers alike to discover innovative methodologies and technologies toward making cost-effective cacao products.

There is a need for initiatives towards improving cacao processing and improve the livelihood of farmers in addressing the basic health and education needs of the communities in Region 2. Dr. Aleth Mamauag, president of Isabela State University (ISU); and Dr. Perlita Raymundo, university researcher, remarked that processing cacao beans is not that much practiced due to confronting problems like inadequate knowledge on processing cacao beans; lack of processing facilities; and uncertainty in the availability of cacao beans supply. In addition, there are only few farmers who are processing their own cacao beans, which is why in the region, tablea can only be found and displayed during trade fairs and sold in two to three selected stores with very limited supply. Furthermore, the identified bottleneck of the cacao processors in the region is the unavailability of supply year-round.

To increase community awareness on the benefits of value-adding for cacao, the ISU-Echague Campus and the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA) collaborated on a cacao research project titled, "Promotion of Generated Cacao Technologies and Development of New Products towards Improved Livelihood". The objective of this project is to

promote new research-generated cacao technologies among farmers and develop new products and/or variety of value-added products through research and development with nutritional, health, and economic benefits, thus opening up new opportunities for income generation and poverty reduction in the region.

Through the basic processing facilities provided through the bureau's support, the project proponents have produced and developed the following cacao food products: tablea tops, complete chocolate mix, 80 percent dark chocolate, 80 percent dark chocolate with yema, pastillas de cacao, polvoron de cacao, cowpea-cacao chip cookies, and tablea-malunggay cupcakes, among others. These products have been subjected to sensory evaluation in terms of aroma, taste/texture, appearance, and acceptability. For non-food products, they were able to produce fossilized cacao leaves for lamp shade.

Dr. Mamauag and Dr. Raymundo, project proponents, said that with BAR's intervention and financial support, the supply of cacao beans in Region 2 may no longer be an issue in the future. Presently, there are groups of farmers and stakeholders who have ventured into cacao production in the region as a result of massive promotion made by the cacao project. Considering the increased

production area planted to cacao by the project beneficiaries in the region and the number of trees growing inside the campus, the supply of cacao beans is deemed sustainable and can meet the volume of local market demand.

The proponents are now actively promoting their products by joining international and national food fairs, and local trade and food exhibits. They also had the opportunity to be interviewed over local TV and broadcast radio. The project and study leaders have also conducted lectures and seminars/ trainings on cacao production and processing for potential entrepreneurs in Cagayan Valley and even outside the region (Bulacan, and overseas Filipino workers from Toronto, Canada, and Singapore) who have shown interest in venturing into cacao production. Likewise, the cacao project has conducted a six-month training on cacao attended by Agricultural Extension Workers (AEWs) from different local government units (LGUs) from four provinces in the region. In addition, there were 310 cacao stakeholders/ farmers who have attended and benefitted from the said trainings.

Since the project is still on-going, the project proponents intend to continue their campaign

to promote their products that will eventually create a sustainable local market. The group applied for registration for their cacao trademark "SIKULATI", and the logo for the Cagayan Valley Cacao Development Center (CVCDC) with the Intellectual Property Office-Philippines (IPOPHL). They received the official registration on 2 May 2016.

The project is being conducted in collaboration with DA-Regional Field Office 2, LGUs in Region 2, Cocoa Foundation of the Philippines, and Food and Nutrition Research Institute. ###

Reference:

Mamauag, A. and Raymundo, P. (2016). Accomplishment report, *Promotion of Generated Cacao Technologies and Development of New Products Towards Improved Livelihood*.

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Through the basic processing facilities provided through the bureau's support, the project proponents produced and developed various cacao-based products. "With BAR's intervention and financial support, the supply of cacao beans in Region 2 may no longer be an issue in the future."