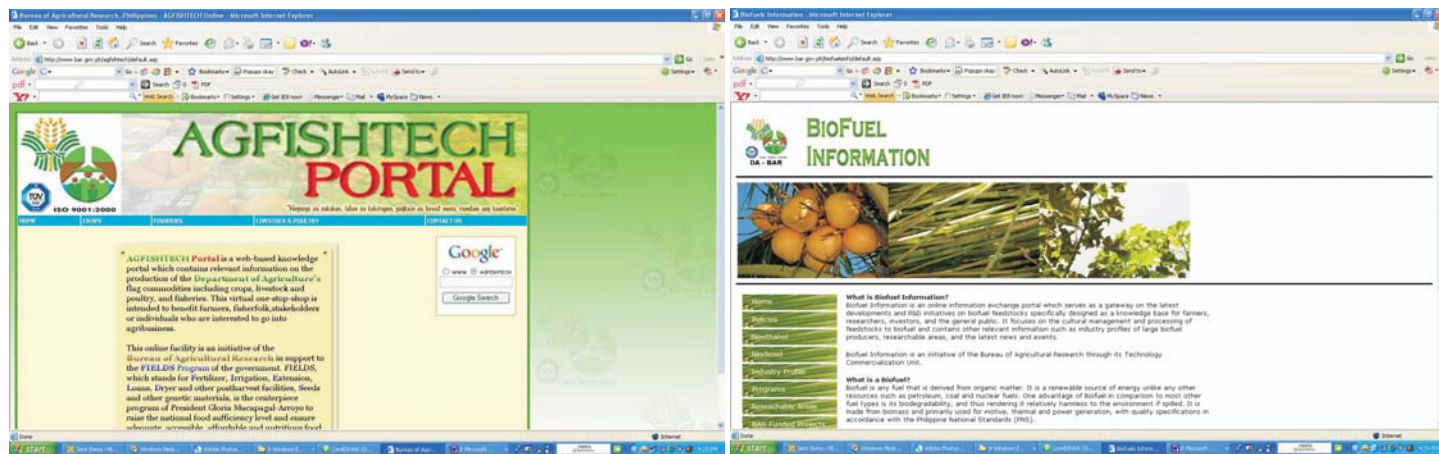


# New BAR websites to empower agribusiness entrepreneurs



<http://www.bar.gov.ph/agfishtech/default.asp>

<http://www.bar.gov.ph/biofuelsinfo/default.asp>

To effectively disseminate useful information on agriculture and fisheries, the Department of Agriculture's Bureau of Agricultural Research (DA-BAR) will soon launch two new websites devoted to biofuel R&D and the production technologies of priority commodities that include crops, livestock, and fisheries.

The *Biofuels Online* was conceptualized and created by BAR to serve as a portal for all relevant information regarding the National Biofuels Feedstock Program of the DA in support to the implementation of the Biofuels Act of 2006. DA is part of the National Biofuels Board composed of government agencies tasked with the implementation of the legislation. It is responsible to put in place the strategies to commercialize biofuels in the country.

On the other hand, *AgFish Tech Online* was designed and set up to provide

concise and updated information and technology on the production of agriculture and fisheries commodities being commercialized in the country. The goal of the website is to give users and relevant stakeholders easy access to information and pave the way for the dynamic development of enterprises on agribusiness.

The interventions of BAR for the government's biofuel program are focused on information, education, and communication activities. This includes technical assistance for the production of viable feedstock for biofuel available through its funded R&D projects nationwide. The bureau is currently concentrating its initiatives on the identification and development of biofuel feedstock for bioethanol such as sweet sorghum and cassava. The Biofuels Act mandates the minimum blend of 5 percent bioethanol to gasoline by 2009, and 10

percent blend by 2011.

The *AgFish Tech Online* supports the extension component of the DA's FIELDS (Fertilizer, Irrigation, Extension, Loans, Dryers, Seeds) Program. To ensure that the relevant and timely information are accessed by the users, BAR's web team will post query forms to be filled by users who want to get additional information on a particular commodity. These queries will in turn be forwarded to experts on the subject matter who will provide the appropriate response to each query.

The launching of the two virtual one-stop-shops is targeted for the first half of the year after the concerned stakeholders and technical experts are consulted on the appropriateness of the websites' contents, and necessary refinements have been made. (Miko Jazmine J. Mojica)



## SNAP hydroponics trademark approved; a milestone for BAR

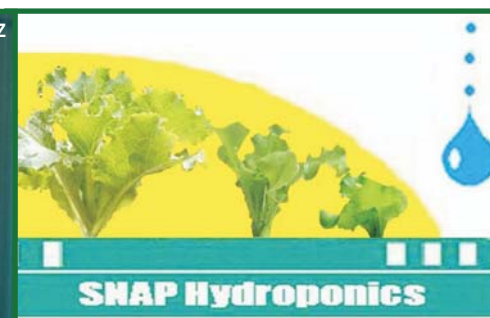


The four women team of BAR-IPRO headed by Dr. Andrea B. Agillon (right) with Legal Unit head, Atty. James Dennis C. Gumpal (left) showing the certificate of registration of the SNAP Hydroponics as a trademark from IP Philippines.

The approval of the SNAP Hydroponics trademark is considered a milestone for the Bureau of Agricultural Research (BAR). This is the first certificate awarded to the bureau by the IP Philippines from among

the IPRs applied for and processed. The certificate bears the Registration Number: 4-2007-006385 and Registration Date: September 15, 2008.

The Simple Nutrient Addition Program (SNAP) Hydroponics is a



Official trademark for SNAP Hydroponics

technology developed by the University of the Philippines Los Baños (UPLB) led by Dr. Primitivo Jose A. Santos and Dr. Eureka Teresa M. Ocampo from a project funded by BAR. The SNAP hydroponics meets the need of a low-cost system of vegetable production specially on lettuce production and is widely adopted by vegetable farmers in the areas of Tagaytay.

The approval of an IPR registration is a tedious process, which may count from months to years. BAR-IPRO applied the SNAP Hydroponics trademark for registration at the IP Philippines in June 2007. BAR-IPRO received from IP Philippines the Registrability Report of the application in October 2007 and was complied for on

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## BAR to commercialize cacao and mango-based products in Quezon

Two projects on village-level enterprise funded by the Bureau of Agricultural Research (BAR) are being tied up with the local government units (LGUs) and farmer-cooperators in Quezon Province to commercialize the technologies on the processing and packaging of Indian mango-based products and the sustainable cacao production system.

The Technology Commercialization Unit (TCU)

monitored in February the two separate projects implemented by Quezon Agricultural Experiment Station (QAES) in Tiaong, Quezon under the DA-Region IV-A office. These projects are funded under the National Technology Commercialization Program (NTCP), one of the major programs of BAR.

### Sustainable cacao production

On sustainable cacao production system, the proponents expect to increase

turn to page 3



RDMIC Bldg., Visayas Ave., cor. Elliptical Rd.  
Diliman, Quezon City 1104  
PHILIPPINES



# Eleazar conducts seminar-orientation at SLSU

Investing on strengthening further the linkage and partnership with state universities and colleges, Director Nicomedes P. Eleazar of the Bureau of Agricultural Research (BAR) led a seminar-orientation on BAR programs, research and development (R&D) priorities and activities to the faculty members and students of the Southern Luzon State University-Judge Guillermo Eleazar (SLSU-JGE) campus in Tagkawayan, Quezon on March 19, 2009.

The seminar was organized to increase the awareness and knowledge of faculty members and students, particularly the agriculture and fisheries students, regarding the bureau's plans and programs on agricultural research and their impacts in addressing the development agenda of the current administration.

As the lead government agency that coordinates and funds research for agriculture and fisheries in the country, Eleazar highlighted the bureau's commitment to improve and strengthen the system ensuring customer satisfaction and continuous improvement through work excellence, teamwork and networking, and

accountability.

As an innovation-driven research funding institution, BAR continuously addresses critical concerns in agriculture and fisheries. Thus, its activities and initiatives are geared towards poverty alleviation through the enhancement of production and profitability, resource sustainability and protecting biodiversity, global competitiveness, and people empowerment.

He highlighted in particular the commercialization of appropriate technologies through the National Technology Commercialization Program (NTCP) in which a possible collaborative effort with SLSU could be initiated.

Additionally, project development and guidelines in availing research funds coordinated by BAR were discussed and explained.

With these, SLSU-JGE is planning to develop and expand their R&D programs

in agriculture and fisheries in relation to their mandate, instruction, research and extension. Dir. Eleazar expressed his commitment to support and provide assistance to SLSU-JGE particularly on their agriculture and fisheries R&D endeavors.

Immediately after the lecture, Administrator Cesar Nazareno expressed his gratitude on behalf of the faculty members and students to Dir. Eleazar for opening a window of awareness and knowledge on agricultural research in the university.

SLSU-JGE is an integrated and extension campus of SLSU in 2002. It is the only campus of SLSU that offers a BS degree in Fisheries. Other courses offered are Diploma in Agricultural Technology, BS Secondary Education, BS Business Management, BA major in Public Administration, and Diploma in Computer Technology. (Rafael S. Umbrero)



BAR Dir. Nicomedes P. Eleazar (center) with the members of the SLSU-JGE faculty during a photo op.



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RITA T. DELA CRUZ  
managing editor/layout

MANUEL F. BONIFACIO, PhD  
VICTORIANO B. GUIAM  
consulting editors

EDMON B. AGRON  
MARLOWE U. AQUINO, PhD  
RITA T. DELA CRUZ  
CHRISTMAS B. DE GUZMAN  
MA. ELOISA E. HERNANDEZ  
DON P. LEJANO  
MIKO JAZMINE J. MOJICA  
LEILANI C. DOMINGO-PELEGRINA  
RAFAEL S. UMBRERO  
writers/contributors

RICARDO G. BERNARDO  
ANTHONY A. CONSTANTINO  
reproduction/printing

JULIA A. LAPITAN  
VICTORIA G. RAMOS  
circulation

MARLOWE U. AQUINO, PhD  
head, ACD

DR. NICOMEDES P. ELEAZAR, CESO IV  
adviser

For subscription and inquiries please contact:

**Applied Communication Division** Bureau of Agricultural Research, Department of Agriculture  
3/F RDMIC Bldg., Visayas Ave., cor. Elliptical Rd., Diliman, Quezon City 1104 PHILIPPINES  
Telephone No. +63 (02) 928-8505 local 3026-3027 Fax: (02) 927-5691 or (02) 927-0227  
e-mail: [acd@bar.gov.ph](mailto:acd@bar.gov.ph)  
Articles are also available online. Please visit us at: <http://www.bar.gov.ph>

field. The recommended planting distance is three meters between posts and four meters between rows," he explained. Proper distance of planting is important since a narrower spacing gives quicker production than larger spacing.

Dragon fruit must be planted in an open field with direct exposure to sunlight. It is not conducive to plant the crop in areas where rainfall is well distributed.

One technology that SMIARC is using in the plantation is the trellis method. Mr. Estellena explained that the lifeblood of the dragon fruit is in the trellis. Once the trellis collapses, the plant hardly survives.

The life span of dragon fruit is around 20 years depending on the durability of the trellis. Concrete posts with iron round bar on top were used to support the plants. This has to be established three weeks prior to crop establishment.

"Here at SMIARC, aside from the concrete posts, we make use of various indigenous materials such as the *madre de cacao*, *kalumpang*, and *magcuno* tree," Estellena explained.

In terms of nutrient management, a combination of organic and complete fertilizer (14-14-14) and urea (46-0-0) were applied. "We use more

organic and more nitrogen. The ideal is to apply fertilizer every 3 months if possible, but what we do at the station is we apply every six months. We are using 2 kg of organic + 25 g urea + 75 g complete fertilizer which we apply per plant," he said.

Estellena also explained the importance of pruning in the production of dragon fruit. He said that, "We need to regularly prune them to obtain an open, manageable, and productive umbrella shape canopy. Also, it is important that we prune right after we harvest the fruits. Regular pruning will induce new shoots for the next cropping season."

After establishing the plant in the field, it would take around 26 months to bear fruits. Harvest must be done 35-40 days after the flower opening.

## Profit from dragonfruits

Five years since its establishment, the techno-demo farm in Manambulan, Davao City is frequently visited by interested farmers who want to grow dragon fruit and even buyers in Davao City. With the successful technologies in dragon fruit now available, more opportunities, both production- and market-wise, lie ahead.

The potential of dragonfruit is bright according to Mr. Estellena because

it commands a very high price in the local market; it costs around P120-150 per kilo. He further said that a three-year old dragonfruit farm can produce 5-6 t/ha with a value of P720,000 in the local market alone. Considering its current demand, it is no wonder that dragon fruit is now dubbed as the new money crop—truly, a high revenue earner.

Aside from showcasing the production technologies on dragon fruit, the group of Mr. Estellena is already distributing planting materials to interested growers. Since the establishment of the techno-demo farm, the group has distributed around 3,000 seedlings/cuttings of dragonfruit to sites in Nueva Ecija in Luzon, Bohol in Visayas, and in Bukidnon in Mindanao for trial productions.

For more information, please contact Mr. Noel T. Estellena, senior agriculturist, Department of Agriculture-Southern Mindanao Agricultural Research Center (DA-SMIARC), Bago Oshiro, Tugbok District, Davao City at tel. no. (082) 293-0109 or (082) 293-0136 or e-mail at [smiarc@yahoo.com](mailto:smiarc@yahoo.com)



Pitaya production technology demonstrated at DA-SMIARC through their Central Experimental Station in Manambulan, Tugbok, Davao City



# Improved production technology for pitaya

text and photos by Rita T. dela Cruz

A native plant from Central and South America, dragon fruit (*Hylocereus undatus*) or “pitaya” is gaining its own niche in the Philippine market.

Although this vine-line cactus has been widely cultivated in neighboring Asian countries such as Malaysia, Vietnam, and Thailand where the weather is conducive for growing this humid-loving fruit, it only reached the Philippine soil just recently.

Given its economic value and competitive advantage in the local fruit industry, it is gaining immediate popularity among interested farmers/producers.

## A techno-demo farm on dragon fruit

Since the dragon fruit industry is still relatively new in the Philippines, production technology remains a major constraint.

Thus, in 2003, a technology demonstration on dragonfruit production was held at the Central Experiment Station (CES) of the Southern Mindanao Integrated Agricultural Research Center

(SMIARC) in Manambulan, Tugbok, Davao City.

With funding support from the Bureau of Agricultural Research (BAR) through its Agribusiness Development Project (ADP), the techno-demo farm aimed to: 1) showcase technology on the production of dragonfruit, 2) mass propagation and distribution of planting materials to other regional research station or interested growers, and 3) determine the economic value of dragonfruit.

Leading this initiative is Mr. Noel T. Estellena, SMIARC's senior agriculturist and lead researcher for the ADP on dragon fruit. SMIARC started establishing dragonfruit production in a three-fourth hectare land area and the planting materials initially came from Indang, Cavite.

ADPs are on-station researches implemented by the DA Research Stations in all the Regional Field Units (RFUs) to showcase new or advanced technologies that will enhance profitability of a farming/fishing enterprise. It is an income-generating activity that aims to

strengthen the strategy of teaching by example, demonstrating the profitability of new/ appropriate technologies that are suited to the conditions of the region to the farmers, and then transferring these new technologies to rural communities of the Regional Integrated Agricultural Research Centers' (RIARCs) and Research Outreach Stations' (ROSEs).

The income derived from the ADP is plowed back to the project for sustainability, expansion, and support to R&D activities and facility rehabilitation of the regional experimental stations. Expectedly, 16 RIARCs and 84 ROSEs are expected to benefit from the ADPs.

## Production technologies showcased

A group from BAR recently visited the techno-demo farm to document the success of this ADP project.

Among the technologies for dragon fruit production showcased in the experimental station are: propagation by cuttings, appropriate distance of planting, use of concrete posts and indigenous materials as trellis for vine growth, applying organic fertilizer, and proper cultural management practices.

According to Mr. Estellena, dragon fruit can be propagated through seeds or stem cuttings but the latter is much favored. “From the cuttings, we plant them in plastic bags for two months and transfer them in an open

## BAR to commercialize... from page 1

crop productivity by at least 30 percent through improved farm management and the establishment of at least 50 hectares of cacao within the four target sites in Quezon Province after three years. The target sites are the municipalities of Tiaong, Dolores, San Antonio, and Tagkawayan. The proponents have started to plant new cacao trees and rehabilitate two areas within QAES for the establishment of the two-hectare technology demonstration farms for the project. The proponents are targeting to produce 15,000 quality grafted seedlings of cacao at QAES to make it available to farmers and interested stakeholders.

The smallscale processing site located within QAES which is part of the project is already built and almost ready for use. According to Ms. Lani A. Averion, one of the proponents for both cacao and mango projects, this is where the beneficiaries can process their raw cocoa produce which they can pool together to enable them to bargain for better price for their product. Moreover, a business kiosk was also established at the main entrance of the station to promote and market the products developed by QAES.

The profitability of the technology was determined with the use of three cash flow analyses for cacao production using the technology, cacao production without using the technology but with intercropping, and integrated cacao production and processing using the technology and intercropping with coconut. Based on the computation, the

last option is the most profitable venture. A comprehensive data on the financial viability of the technology used in this project is available at BAR.

Cacao is now one of the commodities prioritized by the DA's High-Value Commercial Crops (DA-HVCC) program because of its great demand in the local and international market as evidenced by the rising prices of the crop. The Cocoa Foundation Philippines, Inc. (CocoaPhil), a non-government organization, has also proposed a strategic action plan as the Philippines Cacao Roadmap and is in the process of collaborating with different government agencies for the development of the cacao industry in the Philippines.

“The plan is to intercrop coconuts with at least 50 million cacao trees, thereby producing at least 100,000 metric tons of export-quality cacao beans. If this happens, a P60,000 to P80,000 additional annual income per hectare can be gained from cacao harvest. This is definitely a big opportunity for families in rural areas,” said Ms. Josephine Ramos of CocoaPhil.

The biggest cacao-producing area in the country is Southern Mindanao, particularly Davao, followed by CALABARZON (Cavite, Laguna, Batangas, Rizal, Quezon), particularly Quezon and Cavite.

Recognizing the potential of the industry's growth in the region, BAR is also funding the Integrated RD&E Program for Cacao from 2008 to 2012.

## Products from Indian mango

On the other hand, the proponents

of the processing and packaging of Indian mango-based products said that the glut of Indian mango during the months of April to June which brings down its price to low level pushed them to develop a value-adding product to augment the income of rural communities. Besides, as far as the proponents are concerned, there are currently no products developed from Indian mango in the Philippines. Mango tart and pickled mango are among the first products developed from Indian mango. Mango tart is a favorite “pasalubong” item in the country while the market reconnaissance funded by BAR a couple of years ago found a definite market for pickled mango in Europe.

The proponents also tapped the services of DOST for the different methods of prolonging the shelf life of mango-based products, different packaging materials, and suitable product brands. According to Mr. Dennis Bihis, one of the project proponents, they are expecting to receive the DOST outputs in March. However, they have already the nutrition information for their mango tart as of 22 November 2007 which was certified by Dir. Mario V. Capanzana of the Food and Nutrition Research Institute (FNRI). The profitability analysis of the technology is also available at BAR. The evaluation of farmer-cooperators for the two projects is currently on-going in collaboration with the LGU's agricultural offices. (Miko Jazmine J. Mojica)



Project proponents of the cacao project in Quezon show visiting BAR staff around the rehabilitated cacao plantation that will serve as technology demonstration site in QAES.

BAR Dir. Nicomedes P. Eleazar (middle) inspects the product from Indian mango developed by QAES. With him are Dr. Concepcion Amat (left), center chief of QAES-ROS and Rafael Umbrero (right), BAR technical staff.



# BAR intensifies support for agri biotech research

Recognizing the benefits of biotechnology application in agriculture, the Bureau of Agricultural Research (BAR) in partnership with the National Institute of Molecular Biology and Biotechnology (BIOETCH) and selected state universities and colleges (SUCs), intensify its biotechnology R&D program, giving specific attention to traditional and modern biotechnology.

The biotechnology program focuses on integrated processing to increase the value and competitiveness of traditional crops intended for local and world markets. This includes the production of natural ingredients with the application of traditional and modern technology and the creation of clusters of natural ingredients industries. With the Philippines being rich in biodiversity, it can exploit and create new products and medicine for the growing global market.

In a recent pronouncement of BAR Director Nicomedes P. Eleazar, he noted how biotechnology application in agriculture is seen as an answer to issues in agricultural productivity and food security.

With such an initiative, BAR hopes to develop and promote the adoption of new production and postharvest technologies to increase productivity and profitability of selected agricultural commodities while minimizing the environmental impact of farming and fishery practices to effectively manage biodiversity, and help develop science-based policies.

The idea is to fast track agricultural productivity that positively and directly increase farmers' incomes, provides access to nutritious and safer food, and helps achieve a healthy environment.

Based at the University of the Philippines Los Baños (UPLB), BIOTECH has been promoting agricultural biotechnology that improves the productivity of the industry in turning out products that cost less and are safer for family consumption while at the same time, contributes to a healthy environment.

According to Dr. Ida F. Dalmacio of BIOTECH, speculative fear of genetically modified organisms (GMOs)



**“The biotechnology program focuses on integrated processing to increase the value and competitiveness of traditional crops intended for local and world markets. This includes the production of natural ingredients with the application of traditional and modern technology and the creation of clusters of natural ingredients industries.”**

and biotechnology has prevented people from understanding the real potentials and benefits of biotechnology application in agriculture. Dalmacio also clarified that there is more to agribiotechnology than the GMOs and expounded on how biotechnology can be applied in agriculture.

“Biotechnology is the application of any technique that uses living organisms, or a part of it, to make or modify a product, to improve plants or animals or to develop substances for specific functions. If applied to agriculture, it simply means the use of living organisms or part of it, to improve the productivity of crops, livestock and the fisheries,” she explained.

Dalmacio identified specific

biotechnology applications that are now reaping benefits for the agriculture sector. These are: 1) microbial fertilizers/biofertilizers and microbial pesticides; 2) tissue-culture in crops, medicinal and ornamental plants, 3) tissue-culture in crops, medicinal and ornamental plants, 4) animal vaccines, and 5) diagnostic kits of pathogens and toxins.

She concluded that if these agribiotechnology products are continuously promoted, are made available, supported, and applied as complement to other local agritechologies in the country, achieving food security and total productivity in agriculture can be surely achieved. (Rita T. dela Cruz)

# BAR and partners conduct training and field day to expand onion industry



A field visit in one of the technology demonstration areas. Dr. Bonifacio Cayabyab (2nd from left), NCPC project leader, relates the onion production technology used in the techno-demo area. These include population density, fertilization, integrated pest management, and harvesting and postharvest treatments. Also in the picture are farmer-participant Ms. Erlinda San Juan (fourth from left) and Ms. Dulce Gozon (center), NOGROCOMA chairman and chief executive officer. Representing BAR is Ms. Mariko M. Ramos (third from left).

With the theme “Why we need to export onions,” the National Onion Growers' Cooperative Marketing Association, Inc.

(NOGROCOMA), in partnership with the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) and the National Crop Protection Center (NCPC) of the College of Agriculture of University of the Philippines Los Baños, conducted an Onion Training and Field Day at Bongabon, Nueva Ecija on 13 March 2009. This specifically was aimed to: 1) disseminate various extension materials dealing with up-to-date technologies on onion growing and marketing to farmers; and 2) discuss the issues on the need to export onions.

Directed as a step in improving the onion industry's productivity and profitability and to make onion resources and products available and sustainable, the event was organized in line with three DA-BAR-supported projects on retooling the onion industry being implemented by NOGROCOMA in collaboration with NCPC. These are: *Onion Technology Utilization and Dissemination*, *Capability Building for the Onion Growers* and *Protective Structures for Onion Industry*. Representing the DA-BAR were Ms. Mariko Ramos of the Program Development Division and Ms. Christmas de Guzman of the Applied Communication Division.

The event kicked off with a field

visit to one of the techno demo areas.

Establishment of techno demo areas and technology search, testing and validation are the two components of the BAR-supported project on onion technology utilization and dissemination. The project aims to showcase technologies and approaches for the onion industry to reduce production cost per unit volume and be at par with the other onion-producing countries, and be competitive in the global market. The application of onion production technology involves population density, fertilization, integrated pest management, and harvesting and post-harvest treatments. These were discussed by Dr. Bonifacio Cayabyab, NCPC project leader, during the field visit.

Following the field visit was the training of farmers that included focus group discussions (FGDs) and a series of seminars conducted by the NCPC. Among the key players in the FGD were from the group of farmers, exporters, input suppliers, and service providers (transport/cold storage/labor/LGU/media/church/school). The need to export onions as well as the need to get involved in the importation of onions was discussed. Dr. Renato Mabesa who is also a project leader from NCPC, enumerated the fundamentals of the goal of exporting onions. These requisites include the following: 1) identification of market-demanded variety; 2) identification of quality seeds of market-demanded variety which can be subsidized; 3) conduct of varietal trials; 4) cultural management

practices for off-season production of onions; 4) physical characteristics and packaging required by the market; 5) market matching (private sector-led); 6) seminar on moral renewal of onion growers (contract growing); 6) constant support from the DA-Agribusiness and Marketing Assistance Service; and 7) commitment trait of contract growers.

In the seminar series, Dr. Cayabyab lectured on new pests of crops in the Philippines while Dr. Mabesa discoursed on the cultural management of bulb onion. Likewise, Ms. Perlita Aquino-Nuevo, researcher and assistant professor from the UPLB-Postharvest Horticulture Training and Research Center, discussed postharvest handling of onions.

Dr. Rene Rafael Espino, national program coordinator of the DA-High Value Commercial Crops program, delivered his message of support in transforming the onion industry into a market-directed production system during the closing ceremonies.

“Impacts of the projects supported by DA-BAR will revive the industry,” said Ms. Dulce Gozon, president and chief operating officer of NOGROCOMA.

NOGROCOMA is focusing on the production of shallots for possible export to Singapore, Malaysia and Indonesia. Yellow granex for export to Japan and red creole for domestic market are also being planted. (Christmas B. de Guzman)



## Agillon passes patent agent qualifying exam

Dr. Andrea B. Agillon, head of the Intellectual Property Rights Office of the Bureau of Agricultural Research (IPRO-BAR), is now a certified patent agent.

She is one of the 18 successful examinees out of 33 who took the 2008 Patent Agent Qualifying Examination (PAQE) on 30 July 2008. This is the third PAQE examinations administered in the country by the Intellectual Property Office (IP Philippines).

The list of successful passers, for non-chemical and chemical fields, was released through PAQE Board Resolution No. 2009-001.

The PAQE-passers are entered in the Registry of Patent Agents that IP Philippines and are referred to as patent agents—professionals who assist those who file patent applications with IP Philippines.

There are only a handful of patent agents in the Philippines. They are

instrumental in transforming the results of Filipino inventions into concrete and enforceable patent rights. Thus, PAQE was institutionalized to professionalize the patent agency practice in the country and to establish a cadre of patent agents who have the appropriate technical and science disciplines.

Institutionalizing PAQE was undertaken with the assistance of the European Patent Office (EPO), the patent granting authority for Europe.

Agillon has served as the head of the IPRO of the bureau since its establishment in 2004. IPRO manages the IPs accruing from BAR-funded or commissioned researches and provides assistance to other agencies in the management and protection of their IPs.

As part of the bureau's IPR advocacy, Agillon leads in conducting IP Awareness Training and IP Policy Formulations in the regions particularly in coordination with the Regional



Dr. Andrea B. Agillon, head of the BAR-IPRO

Integrated Agricultural Research Centers (RIARCs). She also conducts training for other government agencies and state universities and colleges (SUCs) and provides technical advice on IP-related matters and policy formulation. (Rita T. dela Cruz)

## Tips 'n' tales in buying best, organically-grown farm produce

The search is on for the best and affordable fruits and vegetables that are at the same time, safe, pesticide-free, and nutritious. These food characteristics are requirements of health and wellness programs for healthy living and lifestyle. Thus a reason why there is a need to be on the look out, within a reasonable budget, for farm produce that help ensure the health of individuals and families.

Being healthy means eating the right kind of food and staying fit with proper exercise. In doing so, there is a need to look at the quality of food components especially the fresh ones coming directly from wet markets. Pesticide-free fruits and vegetables are those grown without the use of pesticides and non-organic fertilizers.

To know if these characteristics are present in the produce, the Bureau of Agriculture and Fisheries Product Standards (BAFPS), under the

leadership Dir. Gilberto F. Layese, has assured the general public that they are on top of this activity by working in partnership with the Organic Certification Center of the Philippines (OCCP) led by its coordinator, Ms. Leilani Katimbang-Limpin. Both the BAFPS and OCCP have been working closely to assure the public that Philippine products adhere to the standards when it comes to organically-produced, pesticide-free, and safe fresh produce in the market.

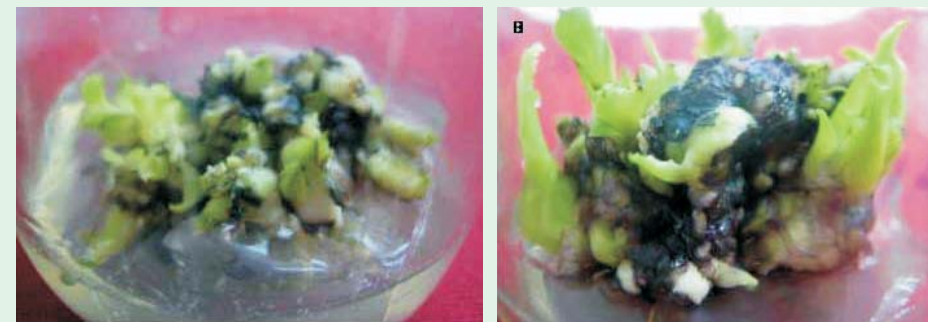
With this assurance, all it takes now is for the consumer to get a good purchase deal. Eating safe and green does not have to be costly, it only requires customers' power and sensitivity.

There are five basic considerations in order that consumers become aware of organically-produced products. These are 1) individuals must use their bargaining power and talk with farmers and traders to negotiate a lower price of the produce, 2) look and wisely

choose products that have been on display for some time but are still in good quality, a slight bruise will not matter since it goes directly to the pot or plate for fresh salads, 3) buy in bulk because these products have longer shelf-life particularly those from the "bagsakan" and can be stored until the next purchase, 4) plan ahead of time – it is wise to list all the things to buy and allocate funds to ensure that quality is not sacrificed over quantity, and 5) always check for product promotions and discounts especially in big stores and markets, as they make a difference in buying.

So, the next time you rush to fresh markets for organic products, think again, be smart and consider these items in order not to sacrifice health over economic value and get your money's worth. (Marlowe U. Aquino, PhD)

## Experts develop abaca virus resistant cultivars



Shoot tips of 'Abuab' (left) and 'Inosa' (right) cultivar showing the meristematic bud formation after two weeks of incubation.

photos courtesy of FIDA

Abaca (*Musa textilis* Nee) is a banana-like plant recognized for its strong fiber which is known worldwide as Manila hemp. However, through the years, the abaca viral diseases-bunchy-top virus (ABTV), abaca bract mosaic virus (ABaMV), and abaca mosaic virus (AMV)—have proven to be very persistent and threaten the continued productivity of this Philippine export crop.

Agricultural scientists have been unable to find viable solutions to eradicate the diseases that continually plague the abaca farms. Conventional

methods have limitations. Spraying insecticides and herbicides to control vectors and alternate hosts is somehow effective but continued usage is hazardous and have detrimental effects to man and environment.

With advances in agricultural biotechnology, genetic engineering, in particular, could be a helpful tool in solving this problem. Thus, the Fiber Industry Development Authority (FIDA) embarked on a project that aims to develop virus-resistant abaca cultivars using modern biotechnology. According to Josephine B. Regalado, chief of the FIDA Crop Research Division and main

proponent of the project, "developing genetically modified abaca will be an effective method to control the diseases".

Experts working on the project are Dr. Vermando M. Aquino of the National Institute of Molecular Biology and Biotechnology (NIMBB) in UP Diliman and Dr. Evalour T. Aspuria of the Department of Horticulture in UP Los Baños.

The project is divided into three major phases: 1) molecular cloning, characterization and development of gene-construct and biolistic (biological ballistics) transformation; 2) development and regeneration system for biolistic-mediated transformation of abaca; and 3) greenhouse characterization and evaluation of genetically modified abaca.

During the first year of the project, ABTV-infected abaca were collected from Albay, Catanduanes, Davao, Laguna, and Leyte. The ABTV genes were then extracted, amplified and cloned. Activities for phase 2 of the project were also initiated. Shoot tip culture from 3-4 month old abaca suckers "Abuab" and "Inosa" (abaca cultivars) were used for the induction of scalp and globule formation which were then used for the establishment of embryonic cell suspension cultures for transformation. All cultures are presently being maintained at the Tissue Culture Laboratory of the Department of Horticulture, Crop Science Cluster of the University of the Philippines Los Banos.

The project is now in its second year wherein DNA sequencing and optimization of culture condition and media formulations for somatic embryogenesis and regeneration are the programmed activities.

This project is funded through the Department of Agriculture-Bureau of Agricultural Research (DA-BAR).

### BAR, PCC... from page 10

first batch of embryos stored in dry shippers containing liquid nitrogen. The embryos are now at PCC headquarters in Munoz, Nueva Ecija and are ready for transfer to recipient buffaloes.

Recipient buffaloes could be served out of either natural or synchronized estrus (or "paglalandi" in Tagalog). Natural estrus is the natural *na paglalandi* while synchronized estrus involves the injection of hormone to bring the buffaloes together in estrus at the same time

Farmers with female buffaloes that are living in a 25 kilometer radius from PCC Headquarters in Munoz Nueva Ecija can avail of the embryo transfer services out of the natural estrus of their buffaloes. All they have to do is to coordinate with PCC.

The transfer of embryo to recipient buffalo is done on the 7<sup>th</sup> day after observation of estrus. Interested farmers could inform the PCC if their buffaloes are in estrus so that their buffaloes can be scheduled for embryo transfer and be served.

PCC can be contacted at telephone numbers 044-456-0731 local 417 or 412 for the Embryo Transfer services.

For embryo transfer services out of synchronized estrus techniques, some identified farmer cooperators in Region III are scheduled for services. Expansion of embryo transfer services is yet to be addressed due to limited number of technical manpower that could carry out the project. (PCC Press Release)



# Use of green water technology boosts shrimp farming

After three years of research, shrimp producers are now enjoying the benefits of using green water technology as biocontrol agent in prawn grow-out culture. Spearheaded by Dr. Jesse D. Ronquillo of the National Institute of Molecular Biology and Biotechnology and Prof. Valeriano L. Corre, Jr. of the Institute of Aquaculture (IA), College of Fisheries and Ocean Sciences from the University of the Philippines in the Visayas, the biotechnology effort on the green water technology was started in 1999.

The project was aimed to develop a technology which will help prevent and control aquaculture diseases like the spread of *vibrio* or luminous bacteria. An outbreak of this disease occurred in 1993 which caused high mortalities and termination of grow-out activities in many shrimp farms in the Visayas.

Different solutions have been identified to control the outbreak of the luminous bacteria in the prawn grow-out ponds.

Chlorination has long been used as a means of reducing pathogens in the water but it was proven to have a short-term effect and rapid repopulation of seawater occurred upon dechlorination. Another identified method of controlling diseases in the water was the use of vaccines and antibiotics. However,

vaccines are not available for most diseases in aquaculture and the use of antibiotics is rather controversial due to the effects these could have when consumed by humans.

Modifications in management techniques were even suggested to address the issue of the luminous bacteria outbreak. The use of semi-intensive farming method and the use of modular ponds were some of the suggestions but they were proven to be rather expensive and laborious.

Since the completion of Dr. Ronquillo and Prof. Corre's project in 2002, shrimp production has been enhanced due to the development of a farmer-friendly technology.

The new developed technology is the use of green water to culture shrimps. Green water technology is a technique that uses phytoplankton-rich water. In this system, saline tilapia is also propagated in fish cages in the ponds to produce green water which contributes in controlling the growth of luminous bacteria that is harmful to the shrimps.

Among the methods of combating aquaculture diseases, the use of green water technology was proven to



be the most functional. Through this technique, pathogen growth can be inhibited, water quality can be improved and the immune system of the cultured species can be stimulated.

The use of biocontrol agents like living microorganisms, aside from being a biological method is said to be a very low-cost means to improve the shrimp farming industry in the country.

The green water technology is funded by the Bureau of Agricultural Research through its biotechnology R&D program. (Don P. Lejano)

## BAR holds second leg of seminar series



The second installment of the Bureau of Agricultural Research's (BAR) 2009 seminar series was held at the 4<sup>th</sup> floor of the RDMIC building last 25 March 2009 with Dr. Maripaz L. Perez, regional director for East and Southeast Asia of the WorldFish Center, as the speaker.

The theme of the said seminar was "Fisheries R&D and Climate Change. It was attended by a large audience from different state universities and colleges along with participants from staff bureaus and attached agencies of the Dept. of Agriculture."

Dr. Teodoro S. Solsoloy, BAR's Asst. Director, welcomed the participants and thanked the Penang, Malaysia-based Dr. Perez for accepting the bureau's invitation.

During Dr. Perez' presentation, she stressed the importance of defining the term vulnerability when it comes to

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# GAP for strawberries now available

After several years of intensive research conducted by the Benguet State University (BSU) in partnership with the Department of Agriculture – RFU Cordillera Administrative Region and the La Trinidad government and farmers association, visiting tourists and the general public can be assured of quality fresh strawberries, thanks to the Good Agricultural Practices (GAP) on the production management system of the crop that can be developed.

Before the introduction of GAP, strawberry farmers can experience 15-20% plant and fruit damage caused by army worms and spider mites. However, the strawberry research team patiently took the challenge to minimize the damage and sustain good production and profit. As a result, the team was able to develop a thorough integrated strawberry production technology with emphasis on pest management.

The GAP technology for strawberry is based on integrated pest management (IPM) of army worms and spider mites which attack strawberry plants during their productive months from October to April. The GAP technology was developed through a research program project funded by the Bureau of Agricultural Research (BAR). This was the Integrated Strawberry R&D Program which included varietal adaptability testing, integrated pest management and improvement of other cultural practices. It



was through the Highland Agricultural Resources Research and Development Consortium (HARRDEC) that R&D activities led to the enhancement of the technology for smallholder strawberry farmers within the Baguio-La Trinidad area.

To date, the GAP strawberry technology is continuously being practiced by the farmers. A demonstration farm within the Benguet State University production area is now under the care of a farmers group with technical support from BSU, DA-CAR, La Trinidad municipal government and the Municipal Agriculture and Fishery Council. A small contribution

was also provided by the United States Agency in Development (USAID) through the Benguet provincial agriculture office and the La Trinidad municipal agriculture office.

With the acceptance, utilization, and application of the GAP strawberry technology, people are now assured of quality fruits as fresh produce and also for product processing into preserves, jams, wines, tarts, and other products. Furthermore, farmers are guaranteed healthy planting materials in time for the next cropping season and this makes possible a sustainable production management system. (Marlowe U. Aquino, PhD)

## CPAR on cacao and pinakbet jumpstarts in Reg IV-A

To increase crop productivity and income of farmers in Region IV-A, the Southern Tagalog Integrated Agricultural Research Center (STIARC) is developing a Community-based Participatory Action Research (CPAR) technology on Cacao + Pinakbet under coconut-based farming systems in Polillo and Bordeus, Quezon.

With this project, it is expected that by 2011, farm productivity in cacao and pinakbet vegetables will increase by 40 and 50 percent, respectively. Likewise, the project is targeting a 50 percent increase in areas planted to cacao and pinakbet vegetables. The project is designed to improve the farmers' standard of living targeting an increase in income by 40 percent and the production of 5,000 quality planting materials by two support nurseries that will be established.

These are the highlights of the implementation meeting conducted by the

Bureau of Agricultural Research (BAR) on 22 to 25 March 2009 at the Municipal Hall of Polillo, Quezon. STIARC Manager and Project Leader Digna P. Narvacan presented and discussed the overview of the project. She highlighted the interventions to be introduced upon implementation of the project.

BAR provided support in the conduct of the three-year project. CPAR, one of BAR's flagship programs, is a location-specific research cum extension that deals with improved farming systems technologies for specific agro-climatic conditions within a province or municipality.

An estimated 3.2 million hectares of the total agricultural area in the Philippines is planted with coconut. Quezon, considered the leading coconut-producer in Region IV-A, has 230,449 hectares planted to coconut with a total production of 1.19 million metric tons in

2007. Particularly in Polillo and Bordeus, coconut is still the major cash crop in the province.

Cacao and pinakbet vegetables are not given much attention although they are priority commodities of the region and pinakbet is one of Tagalog's famous dishes. The technology to be developed will therefore focus on the production of the communities as intercrops to coconut.

Implementation activities will include farmers' training on the production of organic fertilizers. In line with DA's Gender Advocacy Development, farmers' housewives will be trained on by-products processing as additional source of livelihood. Farmers will be given seminars on marketing strategies for pinakbet vegetables.

Brgys. Binibitanan, Libjo, Atulayan and Bañadero of Polillo will serve as pilot sites. (Ma. Eloisa E. Hernandez)



## Nueva Vizcaya CPAR farmers celebrate field day

Four months after its launching, the corn-based CPAR (Community-based Participatory Action Research) project of farmers from Boliwao/Nalubbunan held its first public viewing through farmers' field day on 19 March 2009 in Nalubbunan, Quezon, Nueva Vizcaya.

The activity commenced with visits to different farm components; the high value commercial vegetables, goat and duck pen in nearby farms, and the high-yield promising corn field which is the main highlight of the project.

After the field visit, a program was held wherein Mr. Alex Domingo, provincial CPAR coordinator of Nueva Vizcaya, presented the overview of the project, their experiences and the opportunities brought by CPAR to their place. He also shared the different technologies that were used: soil analysis, variety or quality seed selection, site specific nutrients management (SSNM), and proper planting density for corn; biological pest control (earwigs) for vegetables; and breeding, health management, feeding management and the construction of low-cost housing for goat and duck production.

Mr. Domingo further explained that although CPAR is not a new program, it is still innovative as it aims to intensify the total productivity of their local farmers through adaptation of the introduced technologies (corn, vegetables, livestock and poultry production). It also encourages and capacitates them to undertake more appropriate farming enterprises and to further increase their income.



Mrs. Julia Licayan, one of the farmer cooperators, testifies about the increase of her income. "I used to get an income of P10,000 from my one hectare corn field per cropping, but now with the help of CPAR project, I earned up to P38,000 for this cropping season alone" Mrs. Licayan said as she presented the cost and return analysis of her farm – a model farm for this project. She also realized that corn production could be integrated with other farm technologies and commodities like high value commercial vegetables, goat and duck production that she never knew before.

Attending the program were Orlando Lorenzana, manager of Cagayan

Valley Institute of Agricultural Research Center (CVIARC) and Rodolfo Fernandez, BAR coordinator for Region 2 who gave their words of encouragement and support to the project. Quezon municipal mayor Aurelio Salun-At, expressed his optimism during his speech by saying that CPAR is important in uplifting the living standard of the farmer or even the whole municipality.

The collaborative effort of DA-CVIARC, farmer cooperators, provincial and the local government as well as the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) which provided the funding, made this project a success. (Edmon B. Agron)

## BAR, PCC partner to produce more superior quality buffaloes

With the success of the test tube technology developed by the Philippine Carabao Center (PCC) in producing superior quality buffaloes, the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA) is supporting the project, "Propagation of Genetically Superior Water Buffaloes through Embryo *In Vitro* Production (IVP) and Embryo Transfer (ET) Techniques".

PCC have produced genetically superior water buffaloes both at institutional herd and in the villages. The test tube buffaloes, born in April and December 2002 are now at their breeding ages and the

females have delivered twice within 5 years after their births. Milk production of the resultant test tube females ranges from 8 to 15 liters of milk per day, a production found highly beneficial to the farming families.

The male test tube buffaloes are now being used for breeding purposes. Some are being used as semen donor for nationwide artificial insemination program while others are being used as breeders of identified herds. This enables the propagation of the superior genetic buffaloes in the country today.

The project involves production

of riverine buffalo embryos at the satellite Embryo Biotechnology Laboratory of PCC in India. The embryos were produced from collecting eggs of slaughtered riverine buffaloes. Eggs were matured inside an incubator, fertilized it with semen from genetically superior-progeny tested bulls, and developed the embryos to the pre-implantation stages. Pre-implantation embryos were cryopreserved by slow-freezing technique, and were stored in liquid nitrogen and transported to the Philippines.

This year, a research team from PCC went to India under the DA-BAR/Sen. Ramon Magsaysay funding support to re-operate the satellite laboratory and produce the embryos. The team returned in the Philippines with the

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## Biotech project on using coconut oil industry by-products finetuned

A pre-implementation meeting on the collaborative project of the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) and the National Institute of Molecular Biology and Biotechnology (BIOTECH) under the University of the Philippines Los Baños (UPLB), titled, Utilization of Coconut Oil Industry By-products for the Biotechnological Production of High-Value Product was conducted on 13 March 2009 at BIOTECH, UPLB.

This activity was conducted to evaluate the project's methodology, logical framework, work plan, resource plan, and budget for a more efficient implementation of research and effective utilization of resources based on the requirements stipulated in the Competitive Research Grant Manual (CRGM) of BAR.

Ms. Teresita J. Ramirez, BIOTECH researcher/project proponent, said that the objective of the project is to fast track development of technologies for

production of high-value products from the by-products of the virgin coconut oil (VCO) processing industry.

"Conversion of wastes and by-products of existing coconut processing facilities into high value food products presents an attractive commercial opportunity in view of the bright prospects for health-promoting fermented products," Ms. Ramirez explained.

Use of abundant industrial by-products from existing coconut industries will put these wastes into better use as valuable new products. This will help address the problem of insufficient supply of nutritious food with the availability of high value bio-processed food products. To the general public, availability of more nutritious food products can lead to improved nutritional status and well being.

Ms. Ramirez stated that the project will develop processes for the



from: www.abundantlifeessentials.com

production of value-added products from by-products of VCO industry. It is expected to come up with different processing methods, and recognize high value bio-processed products for food, feed, and health uses.

Collection of by-products and chemical analysis of collected by-products is done to identify their composition. The data (composition) that will be gathered will provide information as basis for subsequent processing and formulation strategies.

The pre-implementation meeting has recommended changes and inputs on some aspects of the project such as: scope of the study in terms of target products and its linkage to specified end-users, prospective products that will be included in the study (to exclude functional food/nutraceuticals and other non-food products), source of the raw materials, and nutritional content of the raw materials/by-products to determine its advantage to other products.

Present during the activity were members of the Monitoring and Evaluation Team which is composed of Dr. Erlinda I. Dizon, UPLB professor/evaluator; Dr. Wilma A. Hurtada, UPLB professor/evaluator; Mr. Jonas Brian C. Almendrala, regional coordinator from Research Coordination Division and Mr. Raymond Patrick L. Cabrera, technical staff from the Program Development Division, both from BAR. (Christmas B. de Guzman)

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the effects brought about by climate change in the fisheries sector.

According to her, "Vulnerability should be seen in two aspects – susceptibility and the coping ability of the various stakeholders to the negative consequences of climate change on fisheries."

Dr. Perez likewise raised the question as to who really is vulnerable to climate change, "Is it the pond owner, the fishermen, or the consumers?"

Before ending her talk, Dr. Perez reiterated the significant role that research and government support should play so that the people in the fisheries sector could adapt well to the harmful effects of the changing climate.

An open forum immediately followed after the presentation where Dr. Perez answered queries from the



Dr. Maripaz L. Perez, regional director for East and Southeast Asia of the WorldFish Center

audience.

The third of the BAR seminar series is slated to be held on 16 April 2009 with the topic on "Innovating Institutions for Food Security: Some R&D Issues". (Don P. Lejano)



# Waste products from mango processing industries find profitable use

Researchers of the University of the Philippines Los Baños (UPLB) is conducting studies to fast track development of technologies for the production of high-value food and non-food products from the wastes/by-products of the mango processing industries.

The one-year project was proposed by a group of researchers composed of Arsenia B. Sapin, Teresita J. Ramirez, Susan A. Sedano, Mary Ann T. Tavanlar, and Wilson T. Tan of the UPLB-National Institute of Molecular Biology and Biotechnology (BIOTECH) and Food Science Cluster, UPLB.

The Bureau of Agricultural Research (BAR), under the leadership of Director Nicomedes P. Eleazar provided the financial support for the conduct of the study.

The project specifically deals with the mango seeds and peel, five studies will be conducted to develop technologies for: 1) enzymatic extraction of essential oils; 2) biotanol production; 3) extraction of phenolic antioxidant (mangiferin); 4) development of health drinks; and 5) sensory, chemical, microbiological, and stability testing of biotechnology-produced food and non-food products.

According to Ms. Sapin, the production of high value products from wastes and by-products can result to



Waste products from mangoes like its peels and seeds find profitable uses in the field of cosmeceutical and personal health

exportable commodities, provide additional source of income to producers, generate employment and create investment opportunities for the country.

A cash crop and dollar earner, mango ranks third among the country's agricultural exportable crops. However, the mango processing industry has been experiencing problems. These include the rising cost of processing due to labor cost,

high cost of the fruit, and the disposal of processing wastes.

The mango seeds and peel constitute to 50 percent of the fruit. Potential markets for mango wastes include the cosmeceutical and personal health care product industries. Products can be of practical use as food, feed and as a renewable energy source. (Ma. Eloisa E. Hernandez)

## SNAP hydroponics... from page 1

the same month. In February 2008, BAR-IPRO received a notice from the IP Philippines (Paper No. 4) with the instruction to remit fees for color claim and additional class of the trademark remitting the fees a month after.

Twelve months from the filing date, BAR-IPRO received the Notice of Allowance with the information that the trademark application has been allowed and its publication in the Official Gazette pursuant to Sec. 133.2 of Republic Act No. 8293 has been approved during the last working day of June 2008.

To facilitate the publication of the mark and expedite the release of the Certificate of Registration, BAR-IPRO provided the publication for opposition fee, issuance fee and second publication fee in August 2008. Finally, the trademark was officially registered on 15

September 2008.

Owners (BAR and UPLB co-ownership) will have the exclusive right to use the trademark of SNAP Hydroponics for 10 years or until September 15, 2018, and is renewable thereafter. BAR's role in IP Management does not end with the registration of IPRs. The bureau also provides assistance for the successful commercialization and transfer of technologies generated by research.

In a meeting with the members of the Technical Working Group for Agriculture of the *Filipinnovation* on 13 February 2009, it was proposed that SNAP Hydroponics technology be used in creating an alternative source of income for the unemployed and laid-off workers in light industries and science parks in Cavite, Laguna, and Batangas.

The meeting was chaired by Undersecretary Fortunato T. dela Peña of the Department of Science and Technology (DOST) with the Governor of the Board of Investments Francisco I. Ferrer, and Head of BAR-IPRO Andrea B. Agillon.

Governor Ferrer expressed his interest in the proposal and said that he will conduct a consultation with the laid off workers and proposed this technology to the Technology and Livelihood Resource Center (TLRC). He also promised to get the approval of the science parks to lend some areas to the workers, where SNAP hydroponics can be implemented. On her part, Dr. Agillon conveyed BAR's willingness to invite the scientist to give the lecture and provide training to them. (Leilani C. Domingo-Pelegrina)

# R&D results and technologies on bioethanol now available

From the projects funded by the Bureau of Agricultural Research (BAR), results of research and development (R&D) on bioethanol production and utilization are now available.

In line with its commitment to identify and develop viable feedstock for the production of biofuels, BAR has commissioned feasibility studies on sweet sorghum and cassava. The comprehensive study in producing bioethanol from cassava covered all important aspects that need to be considered from its agricultural production, to its postharvest, processing, marketing, organization and management, and, most importantly, its financial aspect.

According to the International Society for Southeast Asian Agricultural Sciences (ISSAAS), which conducted the studies, cassava is a low-maintenance crop and has a very high starch-to-sugar conversion ratio which is needed to produce biofuel.

"Potentially, feedstock from cassava can be produced at the lowest cost. With high feedstock yield levels, ethanol yield from cassava becomes comparably better than those from sugarcane or sweet sorghum. However cassava can also be the most expensive among the major feedstock depending on prevailing prices of tubers or derived products," according to the study.

On the other hand, the feasibility study on sweet sorghum showed several advantages of growing the crop for bioethanol. Sweet sorghum is not yet popular in the country but is considered as one of the most important cereal crops as it is a viable source of human food and animal feed. Compared to sugarcane, sweet sorghum is drought-resistant, tolerates flooding, higher yield, higher sugar content, and cheaper and more reliable source of feedstock.

To test the suitability of sweet sorghum under Philippine conditions, BAR started funding the adaptability trials on the crop in different regions nationwide in 2007. Completed projects in Regions IVA, V, and VI showed that sweet sorghum is adaptable for the local condition. The adaptability trials for the remaining regions are still on-going and

their progress is being monitored by the bureau.

Moreover, the crop's commercialization projects funded by BAR in Regions V and CAR, Isabela State University (ISU), and Pampanga Agricultural College (PAC) were successful in producing village-level sweet sorghum food products such as syrup, vinegar, jaggery (a kind of molasses), wine, cookies, flour, coffee, and pop sorghum kernels (similar to popcorn).

On the latest development, the National Biofuels Board (NBB), which BAR is a part of, has approved the

National Biofuels Program Joint Administrative Order that will cut red tape and hasten investments in the biofuels industry, with the creation of a one-stop shop for investors. The joint administrative order also sets the guidelines governing the biofuels feedstock, biofuels and biofuels blend production, distribution, and sale under RA 9367 or the Biofuels Act of 2006. A primary processing center for the crops and the distillery plant with a capacity of 30 million liters of ethanol per year are required for bioethanol production. (Miko Jazmine J. Mojica)



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