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## A GLIMPSE AT THE STATUS OF HIGH-VALUE COMMERCIAL CROPS Will the future be any better?

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# See you at the top!

Allow me to highlight the importance of having a good alliance with our partner institutions to sustain noteworthy programs in agricultural development. I believe that each of us must be a team player in such a way that we can complement each other's capabilities and see through our objectives successfully.

I am happy to note that we have started the year right when we met with Dr. Rene Espino, who is at the helm of the GMA HVCC program of the Department of Agriculture (DA), to discuss a collaborative program on high value commercial crops. This important collaboration is gaining strength as we are now busy coordinating with our stakeholders who presented us with promising projects that correspond with the priorities of GMA HVCC and DA-BAR.

As DA is now committed to strengthen partnerships with both government institutions and private sector, we are on the right track by holding consultations with state universities and colleges, local government units, non-government organizations, and potential investors who are all capable in providing dynamic contributions in the overall growth of the agriculture and fisheries sectors.

We, at BAR, are committed to enhance our linkage with HVCC. We are in the process of refocusing our strategies by ensuring that the strategy of complementation is in placed so that we are supporting projects from the production of raw materials to postharvest, processing, and packing of end-products. It is with some sense of alarm, however, that in my long experience in managing R&D, I have seen a number of projects that did not result

in making significant impact to the sectors. While we have benchmarked on the agricultural advances made by our neighboring countries, our growth, however, still lags behind them. Let it be said that it is not because we can't do any better. The truth is, we do have tremendous potentials and we have not fully tapped this resource.

Admittedly, we need to work double time on developing our core competencies and making an extra effort to recognize and tap these opportunities. As Agriculture Secretary Arthur C. Yap would always remind us, get out of your box. We should not put limits on what we can achieve especially if doing the extra mile will strengthen our resolve.

With this, we are focusing our R&D on market-driven activities that will create the much needed impact on production while at the same time addressing the pressing challenges in the agriculture sector. We request you to constantly refer to the Research, Development, and Extension Agenda and Programs (RDEAP) for 2006-2010 that we prepared in consultation with other DA bureaus and attached offices so that we could be on the same footing in programming our activities.

I am very much eager to see the transformation of our agriculture and fisheries sectors when we all resolve to be committed to our goals and realize that we could not make it without actively collaborating with all our stakeholders. See you at the top!

  
**Nicomedes P. Eleazar, CESO IV**  
 Director, BAR

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## A GLIMPSE AT THE STATUS OF HIGH-VALUE COMMERCIAL CROPS

### Will the future be any better?

Story by Miko Jazmine J. Mojica

Photos by Marlowe U. Aquino, Rita T. dela Cruz, Nicanor B. del Rosario, and Ricardo G. Bernardo

**C**osme took P1.58 billion. Frank more than doubled that amount P3.3 billion. No, they were not seasoned con artists or code names of money launderers. Cosme and Frank were the official names of typhoons that struck the country last May and June and the reported amounts of damage it wrought on agricultural crops.

The impact of Cosme on high-value commercial crops (HVCC) was highest at P793.15 million, according to DA Central Action Center (DACAC). Affected provinces were Antique, Iloilo, Negros Occidental, Palawan, South Cotabato, and Maguindanao. On the other hand, the damage caused by Frank to HVCC was reported by DACAC as of June 24 to cover 5,574 hectares. This was valued at P194.16 million and represented a production loss of 19,303 metric tons (mt).

#### Value

In the midst of these calamities, the Department of Agriculture (DA) is boosting the HVCC sector through the GMA-HVCC Program currently led by Dr.

Rene Rafael Espino. To sustain the high production of leading HVCC such as banana and pineapple, the program identified the need to fast-track the transfer of new technologies to farmers, develop stronger linkage between fertilizer suppliers and farmer groups, and enhance training programs on integrated pest management and off-season production.

Based on last year's report, the HVCC is among the best performers in the agriculture crop subsector. Specifically, banana, pineapple, mango, tomato, onion, cabbage, eggplant, and rubber production are among the commodities responsible for the 47.56 percent in total agricultural output, an increase of 5.57 percent from the 2006 record.

For the first quarter of 2008 alone, the crops sub sector again posted the biggest expansion at 5.59 percent. Of this, gross earnings of HVCC increased by the following percentages: banana, 31.96 percent; coffee, 15.89 percent; pineapple, 15.38 percent; calamansi, 12.59 percent; and rubber, 9.06 percent. The remarkable increase was noted for the following commodities owing to high production

and prices: tomato, 72.43 percent; eggplant, 62.82 percent; onion, 37.53 percent; abaca, 14.52 percent; and calamansi, 12.59 percent.

#### Volume Banana

The 20.65 percent increase in banana production was related to the increased harvest and bearing hills for all varieties in Mindanao, particularly in the provinces of Bukidnon, Camiguin, Misamis Occidental, Davao del Norte, and North and South Cotabato. High production was reportedly induced by the rising exports. Those harvested in Iloilo and Negros Oriental were cited to yield better and bear bigger fruits. According to the report, the absence of typhoon during the first quarter contributed to the high production of banana in the region.

Espino deduced from the preliminary figures presented in the first quarter report that the 1.76 million mt target has been surpassed with the 1.92 million mt recorded banana production for the period, a 20.65 percent increase



from the 2007 record for the same period. Davao, the top banana producer for the period, produced 714,271 mt. It also surpassed its own record for the same period last year at 643,495 mt.

### Pineapple

Pineapple was considered another big gainer after attaining a 9.36 percent growth in output during the period. The performance report gathered that pineapple farms in Camarines Norte were able to recover from the impact of typhoons last year thus an increase in their output. The expansion of Del Monte farm in Mindanao and the additional pineapple areas cultivated in Misamis Oriental, South Cotabato, and Sarangani also added to the increase. A 9.36 percent increase in production for the same period last year was realized when it reached 486,701 mt during the first quarter of 2008, higher than last year's yield of 445,039 mt. Making up the bulk of production are Northern Mindanao with 212,818 mt, and SOCCSKSARGEN (South Cotabato,

Cotabato, Sultan Kudarat, Sarangani, and General Santos) with 223,204 mt.

### Mango

Mango production suffered a 12.06 percent cutback for the first quarter of 2008 owing to the strong winds and rainy periods from November to December last year. The fungus anthracnose proliferated and destroyed the flowers of mango trees in major producing areas such as Pangasinan, Central Luzon, Iloilo, Guimaras, and SOCCSKSARGEN. Espino noted a production of 176,905 mt which was below the target of 224,738 mt for the first quarter.

### Coffee

Coffee posted a 0.69 percent increase in production during the period. Harvests were productive in Nueva Vizcaya, Bulacan, Misamis Oriental, North Cotabato, Sarangani, Sulu, Zamboanga del Norte, and Lanao del Norte.

### Calamansi

The 0.46 percent increase in calamansi production this quarter was largely the result of fertilizer application and good soil moisture because of frequent rains in Central Luzon, according to the performance report. Specifically, the calamansi farms in Nueva Ecija, Pampanga, Bulacan, and Agusan del Sur posted increase in harvest.

### Vegetable

Garlic farms in Ilocos Norte and Mindoro Oriental posted a 1.20 percent increase in output. This was spurred by the good market price of garlic last year which encouraged farmers to expand their area of production.

Meanwhile, onion producers suffered a 3.78 percent curb in output. Reasons factored in were the shifting of

farmers to planting *ampalaya* and yellow corn in Pangasinan; low market price in Mindoro Occidental; and purple blotch disease in Ilocos Sur owing to sudden weather change.

Eggplant production also dropped by 3.92 percent because of farmers' shift to planting *ampalaya* and yellow corn, as well as the continuous heavy rains during the flowering stage of eggplant, thus the negative effect in production.

On the other hand, tomato production grew by 3.27 percent because of the high-yielding varieties Maquilla, Ilocano Red, and Apollo used in the provinces of Ilocos Sur and La Union. Farmers in Bukidnon also expected good market price in Metro Manila hence, their high production. Cabbage production also increased 8.38 percent owing to lesser attacks of pests and diseases. New areas for planting cabbage were also opened in Benguet and Ifugao.

### Rubber

Rubber, which has been experiencing a consistent world price increase for six years now, increased its output to 6.37 percent for the period. In the DA-initiated National Rubber Development Program (NRDP), the target is to increase rubber plantation to one million hectares by 2016.

In 2007, the existing production area of 110,958 hectares produced a volume of 404,070 mt. According to GMA-HVCC, the area developed for 2007 alone reached 20,535 hectares while the target expansion area for 2008 is 21,600 hectares. Zamboanga Peninsula attained the highest production area of 42,133 hectares and volume of 404,070 mt in 2007. Other top producing regions include SOCCSKSARGEN, 157,134 mt; and Autonomous Region of Muslim Mindanao, 29,884 mt. The national target production for 2008 is 8,213,114 mt.

Collectively, "other" crops production inched up by 0.34 percent during the first quarter of 2008, according to the agriculture performance report. An increase in output growth was reported for Chinese pechay, carrots, white potato, oil palm, and papaya. Generally,







favorable weather and the expansion of production areas were cited as reasons for the high growth of most HVCC.

### Interventions

To sustain the growth of HVCC production and reverse negative growth, Espino said they are working to enhance the training and implementation of integrated pest management for pest control and low postharvest losses. The GMA-HVCC is also set to provide mobile packing house for small farmers to integrate production and marketing systems. Moreover, they are intensifying the provision of virus-free planting materials and other inputs.

To stabilize volume and market prices, the GMA-HVCC is working with different institutions to develop more areas for off-season planting. It is likewise supporting the Programang Gulayan ng Masa (PGMA), Bagsakan Centers, and Barangay Bagsakans as measures to increase vegetable production. Another measure being considered is the establishment of technology demonstration farms, in cooperation with the Philippine Seed Industry Association (PSIA), to test the performance of new varieties.

To complement the National Technology Commercialization Program (NTCP), GMA-HVCC is also working with the Bureau of Agricultural Research (BAR) in order to respond to the need to commercialize appropriate technologies on agriculture and fisheries.

Having a good technology is not enough. We have to make sure that the packages of technologies are in place for the effective promotion and transfer of technology. We have to convince the farmers that what we promote will benefit them for the better, Espino said during a consultation meeting with BAR.

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### Abaca... from page 30

9242 is an act prescribing the use of the Philippine tropical fabrics for uniforms of public officials and employees. Currently, there are two textile mills that weave home-grown fibers.

Administrator Soriano is hopeful that the abaca fiber could eventually, be known in the world market the way the Thai silk is known.

The Philippine abaca industry is also looking into China as potential market for pulp as the country imports it for the manufacture of tea bags. China, being one of the biggest tea-drinking countries in the world, is now using tea bags for their tea instead of the traditional way of preparing them. This is a trend from the instant or on-the-go drinks that are proliferating in the market today.

There is a great potential for our fiber industry, but the threat is also looming high and if the industry fails to meet the challenges of the present time, other country might grab these opportunities.

Administrator Soriano, being at the helm of the lead government agency for Philippine fiber, made a call for the R&D industry together with other concerned stakeholders to be more aggressive in their efforts and pledge their support to the industry.

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This article was based on the paper, "The Competitive Advantage of Philippine Fibers in the International Market: A Learning Experience," presented by Cecilia Gloria J. Soriano, administrator of the Fiber Industry Development Administration (FIDA), during the National Agriculture and Fisheries Technology Forum and Seminar Series held at DA-BAR, Visayas Ave., Diliman, Quezon City.





# Global trade patterns in fruits and vegetables:

## CHALLENGES AND OPPORTUNITIES



Story by Rudyard R. Roxas  
Photos by Rita T. dela Cruz

**F**ruit and vegetable products are the most dynamic agricultural commodities traded globally. International trade in fruit and vegetables has been growing at a steady pace for over two decades, as much as 30 percent since 1990. Total imports and exports value of fruits and vegetables in 2001 amounted to US\$71.64B (Diop and Jaffee, 2005).

Analysts attribute the robust growth of the industry to factors related to supply and demand, economic, changing consumer preference, and advances in technology, among other things, which taken together constitute both as opportunities and challenges to fruit- and vegetable- producing countries.

Major regional markets for traded fruit and vegetable products are the European Union, North America (the United States), and Asia (Japan). Collectively, they accounted for 79 percent of world import, with EU getting the bulk of the trade with 51 percent. Demand in these regions will continue to grow. In its September 2007 report, the Economic Research Service (ERS) noted that there was an increase in per capita consumption of fresh fruit (19 percent) and fresh vegetable (29 percent) between 1980 and 2001 in the US which resulted in an increase in fruit imports by

155 percent and fresh vegetable imports by 265 percent. Import shall play an important role in supplementing domestic production to meet domestic demand as increased nutritional awareness, rising income, and growing interest in product variety, freshness, convenience, and year-round availability drive increasing demand.

Intra-regional trading dominates transactions in the top three market regions. High perishability and seasonality of fruits and vegetables compel countries to trade with neighboring countries or countries within close proximity. Trade between the US, Canada, and Mexico comprise 49 percent of the North American Free Trade Agreement's (NAFTA) imports; while on the other part of the globe, more than half of EU imports are traded among its 15 member-states. In the Asian market, Japan sourced most of its requirements from China. Thus, geographical location complemented with favorable agroclimatic condition becomes a comparative advantage.

For countries not in close proximity to huge market (or those not covered under bilateral or regional trade block agreement), creating a market for value-added products should be

considered as their competitive advantage. Changing lifestyle brought about by rapid urbanization and increased purchasing power, particularly in developed countries, is creating a market of consumers willing to pay for safe, high-quality value-added products. Consumption away from home is expected to outpace the growth of vegetables (excluding potato) consumed at home in the US. However, the opposite is expected for the fruit sector. Tropical pineapple, which used to be in demand for processing, is now being marketed as fresh produce, thanks to a new variety of sweet pineapple. In both fruit and vegetable sectors, a good understanding of customer demands and market segmentation shall play an important part in developing a niche market system for value-added products.

In the Asian region, the Philippines ranked as among the world's top 30 exporters of fruits and vegetables (fresh fruits, processed fruits and vegetables, and fruit and vegetable juices) according to a 2004 ERS report. Among the Philippine foreign trade partners are Iran, United Arab Emirates, South Korea, and Singapore, Hong Kong, the U.S., Singapore, Germany, Malaysia, New Zealand, Canada, and Japan. These



foreign trade markets, particularly Japan, are major destinations for the country's top fresh tropical fruits—banana and mango.

The large Japanese fruit and vegetable market is an important trade partner not only for Asian countries but also to the rest of the world. Together with the US, Philippine fresh tropical fruit exports to Japan (mainly banana, followed by pineapple and mango) comprised 55 percent of its total imports (Dyck and Ito, 2004).

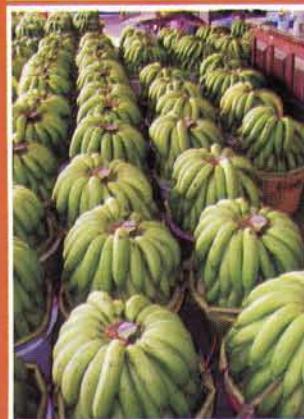
However, future prospects in the fruit sector is characterized by high import penetration for processed and preserved fruits; declining population growth; growing demand for high quality produce (freshness, quality and visual perfection, taste, price, including stability of supply); and increased competition from substitute produce (temperate fruits such as apple, pear, peach, persimmon, plum, cherry, and strawberry) and other major exporting countries such as China, Mexico, South Korea, and Taiwan, which find their way to the Japanese market because of competitive price.

In a bid to sustain the competitiveness of the fruit and vegetable export industry in the highly demanding international market, the Department of Agriculture intensifies intervening activities in various stages of production. The Ginintuang Masaganang Ani-High Value Commercial Crops (GMA-HVCC) Program shall intensify transfer of technology through

trainings and information dissemination (i.e., publications); enhancement of training programs on integrated pest management (IPM) strategies; provision of production inputs (certified planting materials, fertilizers, etc.), and other support services (R&D, crop insurance, postharvest facilities, production and pest management forecasting system).

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**...to sustain the competitiveness of the fruit and vegetable export industry in the highly demanding international market, the Department of Agriculture intensifies intervening activities in various stages of production.**





# Dr. Rene Rafael "Butchoy" C. Espino: Hitting two birds with one stone

*Story by* Christmas B. de Guzman

*Photos by* Christmas B. de Guzman, Ma. Eloisa E. Hernandez, Miko Jazmine J. Mojica, and Nicanor B. del Rosario III

**F**ondly addressed as Butchoy by his friends and colleagues at the DA, he is a 1972 graduate of College of Agriculture (CA), University of the Philippines Los Baños (UPLB). He majored in Agronomy, with Plant Breeding as the specialization.

I was hired as an instructor after one year of being a research assistant at the Vegetable Section of the Department of Agriculture then in the university, Dr. Espino recalled.

After which he took master's degree in Horticulture (major in Plant Breeding) at the same university while still being an instructor. He finished it in 1977. That was the start of him handling projects and taking supervisory assignment. His initial project was focused on banana and cucurbits.

In 1981, he completed his doctoral degree in Horticulture (major in Plant Breeding) at the North Carolina State University, Raleigh, North Carolina. During those times, Raleigh was not too populated. The university is within the city, and I was working with the Department of Horticulture. I worked on one of the diseases of grapes and apples, which is downy mildew, Dr. Espino narrated.

Inquired why he has chosen the path to agriculture, he answered: My father is an agriculturist. He was a big influence to me. He added that he never had second

thoughts of pursuing an agriculture-related career. In connection, he went back teaching agriculture right after getting his doctoral degree.

Dr. Espino takes the position of Professor IV at CA-UPLB. He has been teaching for more than 10 years now. He is married to Teresita Melo Espino and was blessed with two sons, now successful in their own field of expertise.

## His favorite commodity

My primary work was with banana, said Dr. Espino speaking of his undertaken morphological and biochemical (isozymes) description studies on the different cultivars of Philippine bananas. In fact, he is currently the curator of the Banana Gene Bank. He conducts researches on varietal development of banana through mutation induction, somaclonal variation, and protoplast fusion.

In addition, he conducted collection trips to various parts of the country as well as in Papua New Guinea to do collection and recollection work on banana. He also conceptualized and implemented rehabilitation work in areas devastated by banana bunchy top and bugtok diseases in the country which gave farmers the ability to grow and harvest banana again. The work popularized the

use of tissue culture-derived planting materials of banana as part of the control strategy for bunchy top. More important, it resulted in the improvement of the farmers' economic well-being owing to the additional income they derived from banana.

## His role as national program coordinator

GMA-HVCC's main thrust is expansion. That's according to Dr. Espino, who is responsible for the overall planning, evaluation, monitoring, and coordination of the various projects on HVCC being implemented by the different regional field units (RFUs) and staff bureaus/attached agencies of DA.

The commodities involved are: fruits, vegetables, ornamentals, plantation crops e.g., coffee, cacao, rubber, coconut, oil palm), herbs and spices (e.g., onion, black pepper, garlic), essential oils (e.g., ilang-ilang, lemon grass, sampaguita), root crops (e.g., potato, sweet potato, yam).

We deal with increasing vegetable production so that it would stabilize the prices in the market and also for vegetable intake increase, explained Dr. Espino adding that the Philippines is the lowest in terms of local vegetable intake among the countries in Southeast Asia.

World Health Organization (WHO)



figures showed that each individual should have vegetable intake as among the countries in Southeast Asia, of 70 kg/year; but here in our country, we only have 35 kg/person per year, he added. Then, we are also focusing on some export-oriented commodities such as banana, mango, and pineapple. And now, because of good price in the world market, we're starting to look at cacao, coffee, and rubber.

GMA-HVCC is a priority program of DA, created to address the government's priority concerns on food security and poverty alleviation. Specifically, it now focuses on seven national commodities, namely: banana, mango, pineapple, vegetables, rubber, coffee, and cacao.

However, Dr. Espino emphasized they are not closing the windows for regional commodities that have indispensable strength in the region, such as durian and pili. Assistance and support services are allocated by the HVCC regional offices for flagship commodities being facilitated by the regional coordinators.

As national program coordinator, Dr. Espino establishes/maintains linkages among government and private agencies to provide a holistic approach in the production, marketing, and promotion of the priority commodities in different regions of the country. He takes lead in providing technical support in the pre- and post-production technologies of the various crops involved in the program.

### His passion for academe

Before becoming the GMA-HVCC national program coordinator, Dr. Espino was the director of the Institute of Plant Breeding (IPB), UPLB from 1991 to 1994. He took charge in the planning, coordination, and implementation of various researches on variety development of agricultural crops (e.g., legumes, cereals, fibers, fruits,

ornamentals and vegetables).

Streamlined with the activities of the institute through prioritization of work and financial administration, he obtained additional funding support from other government agencies to sustain the researches initiated by the UPLB-IPB. Furthermore, he increased the institute's capability to generate more funds through increased seed production of improved varieties/cultivars of various crops, resulting in more than doubling of its income.

As a college professor, Dr. Espino teaches basic and advanced courses in crop production, horticulture, plant breeding, and genetics.

At present, he serves as major adviser and member of various guidance committees for undergraduate and graduate students. He contributed to the development of new courses in both undergraduate and graduate programs in horticulture, plant breeding and genetics.

He was recognized within the academe by his development of educational materials (e.g., slide sets, transparency sets, etc.) as aid in teaching. Similarly, he co-authored two textbooks used in the crop production and genetics. Many times he served as evaluator of the undergraduate BS Agriculture program of other state universities/colleges under the then Technical Panel for Agricultural Education (TPAE), Bureau of Higher Education (BHE), Department of Education, Culture and Sports (DECS).

At the same time an extension worker, he serves as resource speaker in several trainings and farmer meetings on tropical fruit production and management as well as medicinal crops. He had developed several bulletins, pamphlets, posters and other extension materials for growing specific tropical fruit species. Also,

he conducted land suitability evaluation, assessment of existing growing practices and provided technical assistance to various clientele on how to improve the productivity and efficiency of various fruit orchards.

### His accomplishment and recognitions

Dr. Espino has demonstrated his excellence and dedication in research and development as early as all through his days spent being a research assistant. This was justified when he was awarded Outstanding Research Assistant in 1972 by the Laguna Rehabilitation Program, Province of Laguna. In 1988, he received the Best Paper Award in Pest Control Council of the Philippines (PCCP) Annual Scientific Meeting.

In 1991, he was a recipient of Dr. F.A. Bernardo Outstanding Teacher Award in Horticulture. He also got the Most Promising Invention (Likha Award) given by the Department of Science and Technology (DOST) in 1994 and the R.S. Benedicto Professorial Chair Award for 1996-97 of UPLB. Likewise, in 2003, he accepted the Achievement Award for Extension by the Philippine Fruit Association (PFA) and the Best Paper Award by the Bicol Research Development and Extension Consortium (BIARDEC). Moreover, he was part of the Outstanding CA Extension Team in 2005.

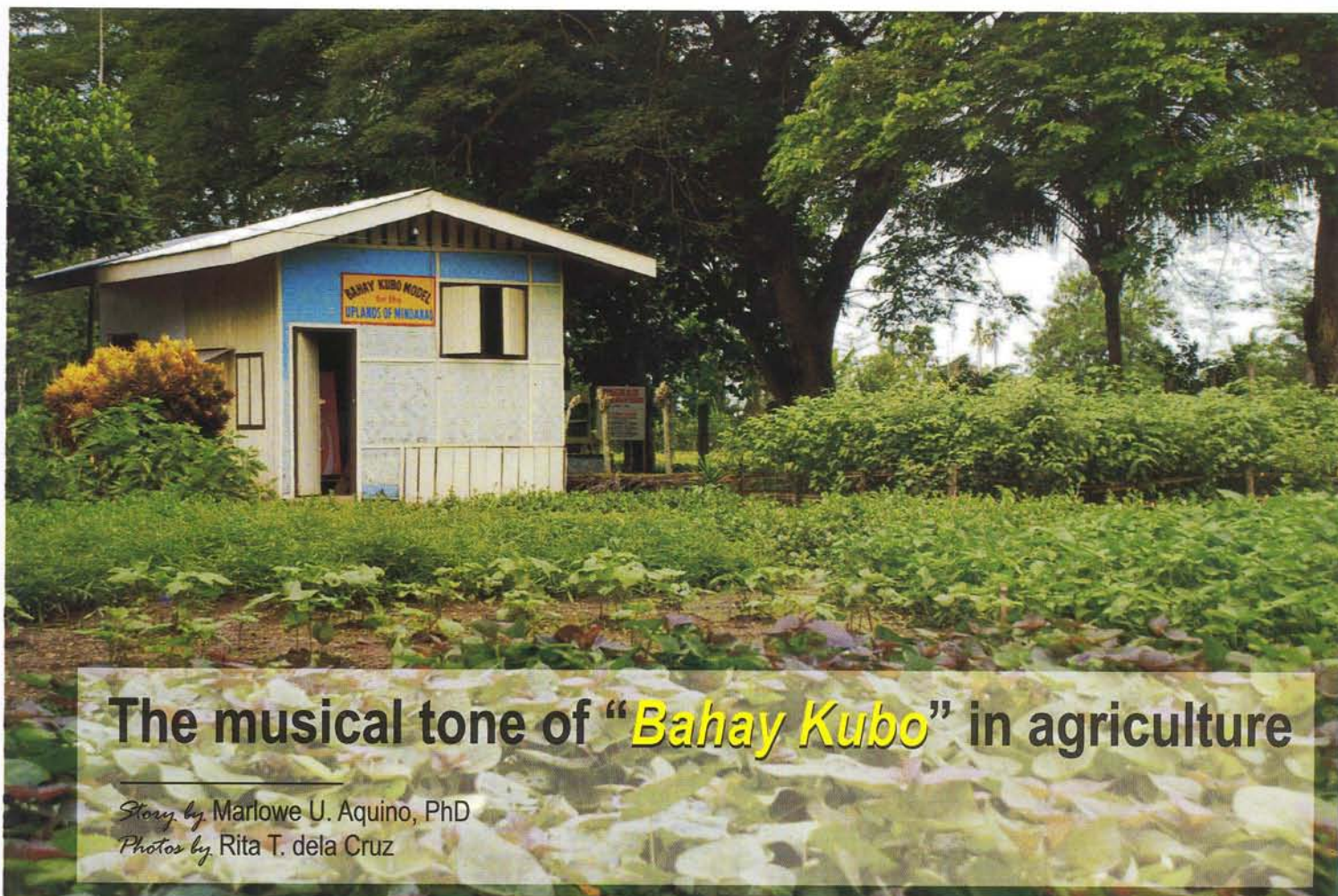
### His working principle

Coupled with the numerous achievements Dr. Espino had, he believes that joining the government itself is a great challenge, and staying in government and doing the best that they (in his case, the GMA-HVCC) can do to help make a significant change in the life of the farmers is the greatest challenge of all.

Output-oriented. Whatever is needed to be done, it has to be done on time and with quality, he answered when asked about his working principle. 🌱







## The musical tone of “Bahay Kubo” in agriculture

Story by Marlowe U. Aquino, PhD

Photos by Rita T. dela Cruz

**H**ave you heard of the song--Bahay Kubo? Most Filipinos did because this is the very first agricultural song learned in the grade school. Generally, young Filipinos are required to know this by heart because it reflects the rural life of people, bountiful agricultural commodities, particularly vegetables, and production practices. The lyrics of the song depict a blend of vegetables symbolically grown and neatly organized in the traditional and simply constructed Philippine house called Bahay Kubo.

### The lyrics of the song

*Bahay kubo kahit munti, ang halaman doon ay sari-sari, singkamas at talong, sigarillas at mani, sitaw, bataw, patani; kundol, patola, upo't kalabasa, at saka mayroon pa labanos, mustasa; sibuyas, kamatis, bawang at luya; sa paligid-ligid ay puno ng linga.*

### Symbolism in agricultural development

Is there meaning to it? What is in the song that makes it uniquely agricultural? Does it symbolize some kind of activity or goods? Whatever the answer is, the song describes in musical tone the theme of agricultural development.

Songs are the immortalization of feelings and expressions of one's own heart and soul. They inspire, uplift the person's spirit or mend a broken heart. Whatever the reason, these songs provide a balance to the individual's psyche.

In the Philippines, most lyrics and composers depend on what they have experienced or gained insights on events, people, and sites. Not to mention, several songs are composed because of the creativity and artistry, including musically-inclined talents that transcend generation to generation. These traits make a highly respectable composer at the same time a singer to whose talent is

manifested in their own rendition of the song. Tone and diction, showmanship, and vocal interpretations are some criteria that make a song worthy of being listened to and appreciated.

The reality to illustrate agricultural development through music has been expressed in many ways but only few composers have crossed the boundary and integrated what could be considered as agricultural song. We have Planting Rice and Bahay Kubo which depict how important our commodities in a rural setting are as these are expressed with peoples' feelings and activities. Planting Rice describes how our farmers toil the soil and work endlessly to produce our staple food. It illustrates that planting rice literally is never fun and requires hard manual labor. But others feel that this just shows the importance of rice.

On the other hand, the song Bahay Kubo or Nipa Hut highlights and is inspired by different local



in agricultural production and food production in the rural areas.

### Beyond the song of hope

Not known to many, the Bahay Kubo is a song of hope. A better agricultural produce for the commodities is the ultimate goal when it is sung to inspire our youngsters and farmers. Believing that this will go beyond production, it is also for people to understand that we can do our part in feeding our own families and communities. The song is an inspiration and constant reminder of what is to be done to augment the required nutritional value of these vegetables especially to kids in schools who sing the song. May this be a continuous effort for our mothers and teachers to teach the song with fervor as it addresses and maintains a bountiful harvest not only in our lands but to our thoughts, deeds, words, and most especially our work in agricultural development. 🌱

***Songs are the immortalization of feelings and expressions of one's own heart and soul. They inspire, uplift the person's spirit or mend a broken heart. Whatever the reason, these songs provide a balance to the individual's psyche.***



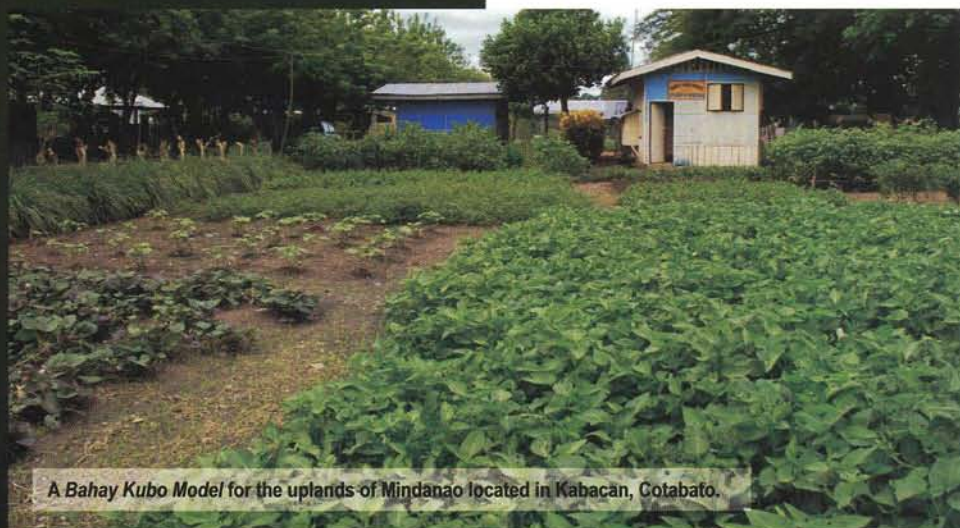
vegetables produced by Filipino farmers. The song describes crop intensification and diversification arranged in an orderly and holistic farming system. The crops follow specific simple farming practices and cropping pattern in a given growing season. The farmers must produce these crops according to his or her available resources. Basically, these crops are for home consumption. But because there is a need to produce more, this simple vegetable gardening became an expanded agricultural venture and became the main crop production of most lowland areas after a bountiful rice production. In effect, these two songs complement one another in terms of farmers' production management system.

### The meanings of the vegetables

A lot of songs are given meanings depending on the interpretation or the rendition of the artist. In the case of the song Bahay Kubo, the vegetables are provided with meanings according to the way these are cooked. In my previous research, I found out that the lowland vegetables were closely associated with Filipino traits and values. These are expressed in the Pinakbet culinary recipe of the Ilocanos. According to this indigenous group, the Pinakbet shows the strength, industriousness, and loyalty of the people, especially during agricultural production. These traits are seen during the entire growing season as value of the camaraderie, resourcefulness, and

cohesiveness and belongingness.

Specifically, each vegetable has a meaning which describes the farmer and the Filipino in general. The eggplant (tarong) which is small, round-shaped or slender, green or purple means longevity; the lady's finger (okra) describes truth and elegance; bitter gourd (ampalaya or parya) which is small, round-shaped, and green means strong will power and aggressiveness; the garlic, tomatoes, and onions (lasana) all together mean happiness; and winged beans, string beans, lima beans, green chili which are elongated and green illustrate generosity. Peanut (mani) describes friendship and loyalty; and squash (kalabasa), bottle gourd (upo), and loffa (patola) mean strong partnership and belongingness. These meanings were taken from the farmers who gave meaning to their responsibility



A Bahay Kubo Model for the uplands of Mindanao located in Kabacan, Cotabato.



# FROM THROW-OUTS TO TURNOVER: Mango rejects find profitable use through value-adding

Story by Rita T. dela Cruz

Photos by Rita T. dela Cruz and DA-ILIARC

The mango industry, being the country's pride and signature export, has to maintain a standard quality for its physical properties. The fruits have to be smooth and big on the outside, fleshy, sweet and almost fiber-less in the inside. Apparently, not every mango picked from the tree will pass the quality test, especially during peak season. After sorting them out, many of these harvested mangoes will be discarded as rejects.

By definition, rejects are those fruits with physical damages or those with cracks, bruises, and other forms of physical injuries, including deformity and undersized. It also includes those fruits damaged by

strong winds or typhoons and during harvesting owing to improper handling.

In the Ilocos Region, peak production months run from March to May causing the price of high quality mangoes to decline and the rejects much cheaper. According to a report of the Department of Agriculture (DA) in 2005, the average volume of rejects during peak harvest months reaches to approximately 38 percent.

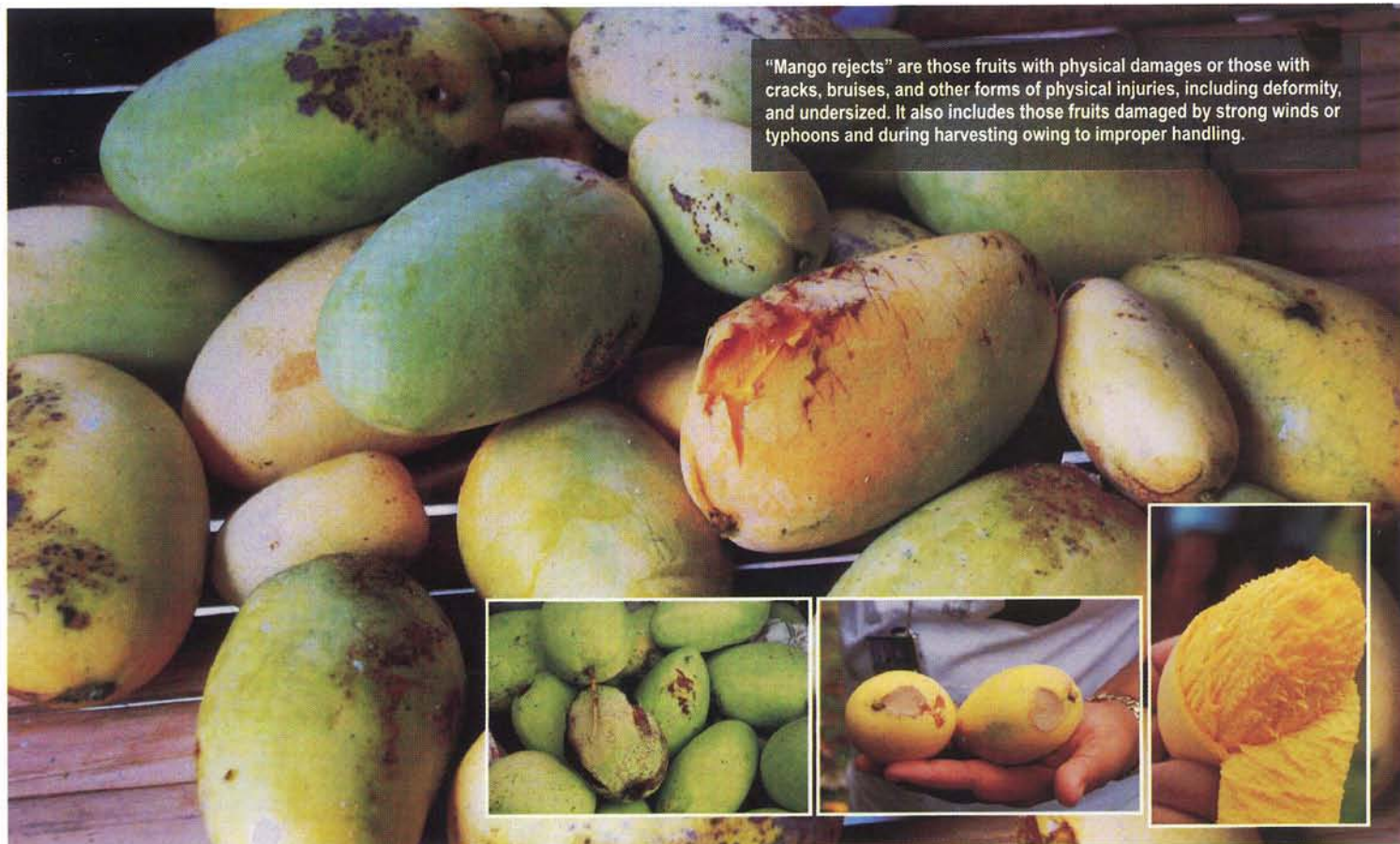
## Adding value to mango rejects

Most people enjoy eating ripe and green mangoes. But with the perishability of ripe mangoes, storing and

transporting them to distant markets is causing much income loss to farmers, especially when the supply is high. The fruits usually ripen at the same time, so the market prices fall, making it hard to sell them at a good price.

Value-adding through food processing is a good strategy to utilize mango rejects and other nonmarketable fruits. It adds value to mango while keeping the cost of production down. It is also important for the products to be competitive in the world markets. Preserving fruit to enjoy its flavor throughout the year is important to avoid wastage and increase income. Some of the

"Mango rejects" are those fruits with physical damages or those with cracks, bruises, and other forms of physical injuries, including deformity, and undersized. It also includes those fruits damaged by strong winds or typhoons and during harvesting owing to improper handling.







At ILIARC in Bacnotan, La Union, a group of researchers was able to develop 10 promising mango products from the nonmarketable or rejects of Carabao mango.

simplest ways of preserving fruits include drying, juicing, and making jams or chutneys.

Next to banana and pineapple, mango is the third most important fruit in the country in terms of production and area planted. In terms of nutrients, ripe mangoes are packed in Vitamins A while the greens are rich in Vitamins C. And with the availability of various processed products in the market today, there is no reason why processed mangoes will not find its way to the top, given its competitive strength over other fruit-based processed products. Processed mango finds good market because of its long shelf life, uniformity in quality, and ease in transport.

### Products developed from mango rejects

At the Ilocos Integrated Agricultural Research Center (ILIARC) in Bacnotan, La Union, a group of researchers, led by Lydia M. Valdez of DA-RFU 1, was able to develop 10 promising mango products from nonmarketable Carabao mango fruits.

The 10 products developed from mango rejects were jam, jelly, dehydrated mango, candy, wine, pickles, chutney, powder, fruit cocktail, and vinegar.

The study was conducted from 2006 to 2007 to evaluate the acceptability of the processed mango products that they develop to provide additional source of income, especially during peak harvest months when there is a glut in supply and the price of mangoes is much cheaper.

A sensory evaluation was conducted to determine the acceptability of the products and was based on specific quality attributes for each of the processed product. Specific quality attributes used were in terms of appearance, color, aroma, taste, flavor, texture, and palatability. Shelf life and cost and return analysis were also studied.

In the evaluation of the 10 processed mango products, results

showed that storage period lasted the most for mango wine, vinegar, and *sinigang* mix powder. They did not show spoilage up to the 15<sup>th</sup> week of storage.

Meanwhile, mango *sinigang* mix powder, fruit cocktail, and wine ranked the highest among processed products in terms of overall acceptability and profitability. The developed mango *sinigang* mix powder ranked number one in the overall acceptability and obtained the highest net income of P35.71 a kilo of green mango used.

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The article was based on the study, Processing and Utilization of Rejects and Non-Marketable Carabao Mango Fruits by Lydia M. Valdez, Benjamin O. Ronduen, and Editha C. Estacio of DA-RFU I-ILIARC, Bacnotan, Ilocos Norte. For more information about the study please contact them at telephone numbers (072)-719-0188, (072)-719-0189 or through mobile no. 09063043773 or email them at: [iliarc@yahoo.com](mailto:iliarc@yahoo.com)



# A sweet, crunchy bite for the banana chips industry

Story by Ma. Eloisa E. Hernandez

Photos by Julia A. Lapitan and Rita T. dela Cruz

**L**akatan and Latundan in Luzon and Visayas. Cardaba, Cavendish, Lakatan, and Bungulan in Mindanao.

This shows the vast production of banana in the Philippines. Lakatan, Latundan, Cavendish, Cardaba and Bungulan are some of the banana cultivars popularly grown in the country.

Banana or *Musa* sp. is the leading fruit grown in the Philippines and a favorite fruit dessert by Filipinos. In 2005, Philippine banana production posted fourth in the world market, accounting for 9.38 percent of the world's total area planted to banana. Production volume grew by 7.3 percent during the first semester of 2007. This is the reason why banana is considered as one of the High-Value Commercial Crops or top country's dollar earners.

One big boast to the export potential of the Philippines is the *Cardaba* cultivar. This has been the main ingredient of what is fondly eaten as "banana chips". The *Cardaba* variety is in high demand in the export market because of banana chips.

According to the Bureau of Agricultural Statistics (BAS) Report in 2006, major country destinations of banana chip exports are the United States, Vietnam, Singapore, Taiwan, China, Japan, Hongkong, Germany, France, UK, Netherlands, and the Union of Soviet Socialist Republics.

As a food, *Cardaba* banana is considered the fourth most important staple next to rice, corn, and wheat. *Cardaba*, which is rich in potassium and dietary fiber, is a good medicinal cure for blood pressure, arthritis, heart disease, gastric ulcers, and anemia. It is even suggested for depression.

## Cardaba for banana chips

Aimed at enhancing the processing and utilization of banana products and by-products in Region XII, the Central

Mindanao Integrated Agricultural Research Center (CEMIARC) developed a Community-based Farming System project in 2005 titled "Banana Industry in Region 12: Fresh Fruits and Processed Products" (Phase II) with emphasis in promoting technology options on banana production, product and by-product utilization through value-adding as a result of project assessment in 2004.

This is a follow-up Community-based Participatory Action Research (CPAR) project of CEMIARC on CPAR/OFR Integrated farming system (Phase I) in 2003 aimed at showcasing technology options in farming systems for agricultural productivity and increased profitability.

This is also in line with the Banana Strategic Plan 2007-2010 that envisions the Philippines as a leading banana product exporter contributing towards food security and improvement of the socioeconomic status of all stakeholders. This primarily aim to increase the export potential of banana chips and other products from 21,000 mt to 41,000 mt by 2010.

Project Leader Angelita F. Abrazado said the CPAR Region XII Project on Banana was started by DA-CEMIARC in 2003 as a

result of a series of consolidation on the comprehensive biophysical information, specific technology option through the conduct of PRA in the provinces of Cotabato and Sultan Kudarat.

In collaboration with the local government unit (LGU) concerned, a CPAR on Integrated Farming System was conducted and established in Brgy. Tagbac, Magpet and Brgy. Bao, Alamada in Cotabato province and in Poblacion Bagumbayan and Tinaungan in Pres.





Quirino, Sultan Kudarat.

During the first phase of the project, four farmer cooperators were identified per site. Farmer-beneficiaries were given inputs such as tissue-cultured banana plantlets, corn seeds, grafted mango seedlings, and one head of goat or swine for a one-hectare farm area with provisions of a rollover scheme. Repayments were extended to interested expanded farmer-beneficiaries and adopters of the project in the community.

The second phase of the CPAR project dealt mainly on the banana commodity, particularly the *cardava* or *saba* cultivars.

From four cooperators in the first phase, this remarkably increased to 24 in the second phase. LGU Bagumbayan remained on top of the CPAR sites, sharing counterpart for 11 cooperators through the leadership of on-site project leader Mr. Rizalito C. Mallorca. A total of 35 farmer-cooperators were organized as the Bagumbayan Banana Growers Association (BBGA).

"The continuous monitoring and technical assistance of DA-CEMIARC researchers, the CPAR cooperators and the BBGA remain intact and producing quality *cardava*, and processing and marketing of crunchy *saba* leading to the direction that CPAR for 2008 will be focused on the province of Sultan Kudarat, involving the municipalities of Bagumbayan, Isulan, and Pres. Quirino," Ms. Abrazado explained.

Proper management of banana plantation and different processing technologies such as sweet banana chips, salted banana chips, banana pastillas, and banana shake were introduced to the farmers.

This involves the total family in the farming business, generating added income for them. "Husbands produced quality fresh *cardava* banana while their wives were encouraged to improve the process techniques of banana chips," Engr. Jocelyn Torres, the group's co-leader, explained.

There are currently three regular processors of banana chips or "crunchy *saba*" in Bagumbayan, each producing 100 packs per week at P10.00 /100g pack.

The Municipal Local Government Unit (MLGU) in concerned towns has taken its role in developing further the banana industry and introducing banana processing technology to hit the local market.

### Sweet benefits

After a year of implementation, it came out that among the specific commodity and technology options introduced, banana



farms were sustained and remarkable increase in production area was noted.

Testimonies of increasing their family income by not less than 10 percent through the banana that were intercropped in their area were notably taken.

"Furthermore, a weekly income is being earned inasmuch as bananas are continuously harvested if properly maintained which could sustain their daily needs, including allowances of their children in school," Engr. Torres added.

Inspiring statement from Mrs. Luz Lanado of Purok Roxas, Poblacion, Bagumbayan, one of the first four (4) farmer-cooperators, says "*Dako gid ang nabulig sang proyecto sa saging sa amon, labina sa panahon sa tag init. Kada semana may ara ako income nga makabulig sa amon panginahanglan sa pamilya.*" (The project on banana helped us a lot, especially during dry spell. We have a weekly income to sustain the basic needs of the family.)

"The sustainability of production and income, potential market both in fresh and processed products makes the banana farming in Bagumbayan Sultan Kudarat a propelling industry," Ms. Abrazado proudly mused.

"The CPAR project in Region 12 funded by the BAR, created a great impact on the banana industry in the region. Farmers who practice mono-cropping are now looking into the possibility of

incorporating banana in their farm for a more sustainable income," Engr. Torres added.

Through the CPAR project, the total area planted to banana in Poblacion Bagumbayan is now 50 hectares, with 45 farmer-beneficiaries and adopters, and an average production of 2.0 metric tons/hectare/month.

The CPAR project paved the way to the technological transformation to specific technology options in the different sites, not only to the farmer-cooperators but also to the community as a whole, making banana production a part of the total farming systems in the communities.

As a whole, no doubt that the Philippine banana chips industry through utilization of *Cardava* cultivar shows a great potential as an added income for the our local farmers.

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# Valuing commercial crops towards an

Story and Photos by Marlowe U. Aquino, PhD

Philippine tourism development today has taken a major leap forward by incorporating agricultural and environmental activities into its programs that encourage active involvement and participation of people and their communities. Specifically, these are the agri-tourism and eco-tourism endeavors of institutions, organizations, local government units, or even individuals who use technologies generated and developed out of agricultural research and development (R&D) and protection and conservation practices on the environment as a profitable activities for tourists, including its aesthetic valuation.

In the Department of Agriculture (DA), agri-tourism is a welcome initiative that opened doors for development. Although this has been going on for several years, R&D breakthroughs are the key factors that made the fusion of these two broad areas to jointly address social and economic development. Agri-tourism integrates the gains of research and development, particularly the innovative

and modern technologies that produce quality products. These technologies vary from protective and precision agriculture, organic agriculture, food processing and development, agricultural information and communications management, and even biotechnology.

Furthermore, agri-tourism sets the inclusion of community activities to show the beauty of agricultural landscape which attracts educational tours for students, local government officials and even researchers with interest in these developments. This is the reason why innovative Agri-tourism is now the by-word for researchers and development practitioners who realized that there are still room for improvement and enhance this new field of study especially incorporating the important role of high-value commercial crops.

## The agri-tourism activities

Over the years, Philippine Agri-tourism has changed in perspective and directions. Before, local areas simply

provided a picturesque depiction of things to be expected and what could be offered in terms of the agricultural produce in the locality. They sell and promote these for monetary gains.

**Nowadays, a major shift and upgrades were done by incorporating interactive activities wherein tourists could be part of the agricultural activities while appreciating the value of the produce.** How is this done?

Most of the country's agricultural production areas now integrate production management activities with tourism activities. Notable agri-tourism activities in the country which highlights high-value commercial crops include Baguio's *Panagbenga* Flower Festival held every February, La Trinidad's Strawberry Festival in March, Benguet's *Adivay* Festival which highlights vegetables and rootcrops in November, Kidapawan City's Durian Festival in August, Guimaras Mango Festival in April, and Camiguin's *Lanzones* Festival in October. All of these sites and other tourist destinations made sure that the latest and innovative agricultural technologies are integrated in their tourism programs and interactive activities of communities as part of the tourist itinerary.

## Advocate implementer

The interactive agri-tourism activity initially started in the municipality of La Trinidad, Benguet over two decades ago. However, there was no formal documentation and descriptions during those times but the local people and communities already were into its practice and activities. This is normally observed during the summer season when local farmers encourage tourists to be involved in vegetable harvesting, strawberry picking, and even ubi processing, to name a few. The main goal of the activity is to encourage tourists to experience actual agricultural





# innovative agri-tourism development



activities while appreciating the value of the farmers' produce. At the same time, it encourages interaction between the farmers and tourists, especially on the commodity production management system as a vehicle for information sharing and technology transfer.

Furthermore, these activities expanded to other agricultural commodities which have high commercial value such as cutflowers and ornamental plants, local winery activities, and even weaving activities. All of these became part of the emerging trends in local agri-tourism activities. Because of these, the La Trinidad local government, in collaboration with the Benguet State University (BSU), decided to add more activities for tourists to participate, experience, and be part of the interactive tourism activities. Added activities now include horse back riding, mountain climbing in the valley, coffee bean harvesting, and observational-educational tours on organic agriculture, silkworm production, and even vegetable and food processing.

But what have these got to do with the valuation of commercial crops and local tourism activity? Well, these activities changed the manner of people's interaction with tourists and the establishment of relationships in production, processing, and marketing activities between farmers, traders, researchers, and tourists. On the whole,

this changed the outlook of people and usage of tourism activities to influence the agricultural landscape of the municipality of La Trinidad and BSU. An interesting observation worth sharing is the locals or the community's response to the needs of the tourists. Evidently, there was an avenue for cultural sharing on people's integrity and identity while promoting agricultural products for increased production and profit.

Explanations on the different processes of agricultural production and food processing management became a must for interaction and learning experience. Crops, particularly vegetables such as cabbage, broccoli, capsicum, tomatoes and cucumber, rootcrops such as potato, sweet potato, and yacon, and strawberry were more appreciated and given importance as to quality and aesthetic value including cutflowers and ornamentals which were the subject of beauty and landscape aficionados. To top all this, no single agricultural activity in the area only focuses on

the crops but considered the transformation of their community as a tourist destination for more responsive and innovative venture.

## What lies ahead?

Making sense on the importance of agri-tourism in the country is now the emerging trend in community development. The Department of Agriculture, provincial and municipal local government units, and state universities and colleges, including specific communities, jointly collaborate and develop tourism activities that highlight not only agricultural products but also the way of life of people. This new direction in agricultural and tourism development makes it a business activity. With this activity, the assurance of communities to be involved in agricultural activities will not only be treated for people's empowerment only but support the comprehensive development program including tourism initiatives as a whole. 🌱







## 'Queen' from Camarines Norte: More than your sweet course

Story by Ellaine Grace E. Nagpala  
Photos courtesy of FIDA

Camarines Norte takes pride in being the fourth largest pineapple-producing province in the country. In 2006, it devoted a total land area of 2,400 hectares for the production of the 'Queen' pineapple (*Ananas comusus* cv. 'Queen'). The 'Queen' or Formosa cultivar has been found to be very adaptable to the soil and climate of Camarines Norte where it is usually intercropped with coconut.

The 'Queen' is among the three cultivars of pineapple cultivated in the country; the two others are 'Smooth Cayene' and 'Red Spanish'. It is a small variety whose weight does not exceed two kilograms. As compared to 'Smooth Cayene', 'Queen' is more resistant to disease infection. The 'Queen' pineapple is also renowned for its golden yellow flesh, crisp texture, and mild delicate flavor which made it very suitable for fresh consumption.

But the pineapple is more than a source of nutritious fruit for snack or dessert.

In all the 12 towns of Camarines Norte where an average of 25,000 'Queen'

pineapple is planted every hectare, a batch of 875,000 leaves can be derived. Such number of leaves can be considered as a farm waste. However, instead of totally discarding the pineapple leaves, the residents of Camarines Norte have thought of something where they could develop the waste product into something useful and beneficial.

The Labo Progressive Multi-Purpose Cooperative (LPMCP) is among the organizations in Labo, Camarines Norte that promotes livelihood projects on pineapple production and integrated leaves processing. Among its missions is to provide more employment and create more innovative products that will respond to the needs of its members and the international market.

During the recently held regional technology forum for Luzon B Cluster in Naga City, the general manager of the LPMCP, Mr. Mario M. Espeso, presented products that can be derived from the Formosa pineapple, specifically from its

leaves. The production of handwoven and machine-decorticated fibers is among the livelihood programs of the LPMCP for its members, the majority of whom are farmers.

### Handwoven piña cloth

The Barong Tagalog became famous for the use of handwoven cloth from the fibers of the pineapple leaves aside from being the national costume of the Filipinos.

The LPMCP has adopted the method of producing fibers from the leaves of the pineapple through manual scraping from the Philippine Textile Research Institute (PTRI). Contrary to the fibers produced using a machine, the manual scraping method produces good quality fiber since it allows the separation of the white, fine, and low in strength fibers from the coarse, brownish, and strong fibers. The fibers extracted from the leaves of the 'Queen' pineapple are suited for the manufacture of piña cloth since it has passed the test on



fineness, tensile strength, and the required quality standard by the PTRI.

The fibers derived from the leaves of the 'Queen' pineapple undergo the punctilious task of weaving to achieve a piña cloth. Sometimes, the fibers are interwoven with silk to come up with piña silk, which is later made to Barong Tagalog, camisas, or kimona.

### Fabric and paper from machine decorticated fiber.

The LPMCP pioneered the use of machine decorticator in Camarines Norte in extracting the fiber from the leaves of 'Queen' pineapple. Developed by the Fiber Industry and Development Authority (FIDA), the time spent on the extraction of fibers using the decorticator machine from the pineapple leaves became shorter, and the job became relatively easier as compared to the manual extraction method.

Generally, the fiber extracted through this method is strong and silky in appearance, hence, can be manufactured either into fabric or paper.

The polypiña cloth is a fine, translucent fabric composed of 20 percent decorticated fiber blended with 80 percent polyester. The cloth is used as a textile material for office and school uniforms. Due to its good quality, the polypiña cloth was launched as one of the tropical fabrics along with banana and abaca fabrics in the 1st International Manila FAME Market Week in 1997.

The decorticated fiber is also an excellent material in making a handmade piña paper as it produces a fine, smooth, thin paper. This can be mixed with other materials such as cogon or rice straw to make the paper stronger at the same time yield a different quality of handmade paper. In turn, the handmade paper can be made into handicrafts, novelty items, paper thread and paper fabric.

### Market potential

The use of pineapple fiber in the textile industry has long been recognized and the demand is continually increasing. Together with abaca and banana, fiber from the 'Queen' pineapple is now being developed as substitutes for cellulose fibers. Its considerable volume of production is being eyed to supplement the limited production of cotton.

In the case of LPMCP, the cooperatives' fiber-based products are marketed locally and internationally.

Currently, the cooperative supplies its handwoven Formosa pineapple cloth to Laguna-based embroiders, garments manufacturers, boutique, and department stores. With the demand in foreign markets for good piña cloth that can meet the preference of high end consumers, the cooperative has also targeted to export its handwoven products to Japan, Hong Kong, USA, Canada, France, Denmark, Germany, Switzerland, Italy, The Netherlands, and other countries in Asia.

Meanwhile, the signing of Republic Act 9242, otherwise known as "An Act of Prescribing the Use of the Philippine Tropical Fabrics for Uniforms of Public Officials and Employees and for Other Purpose," will eventually call for the commercialization of the decorticated piña fiber which is needed in the fabrication of polypiña cloth. The demand for the polypiña cloth will soon increase pursuant to RA 9242. This will eventually require increase in the market production of the tropical fiber to meet future demands.

Aside from the manufacturers of school and office uniforms, the machine decorticated fiber can also target manufacturers of carpets, bags, and handicrafts, spinning mills, and foreign companies.

The handmade paper from the machine decorticated fiber commands good price in the market due to its distinct overall quality. This product is very popular in foreign countries such as Japan, USA, Australia, and Europe. Potential markets for this product would be easy to find as crafts and novelty items made from the handwoven paper are always in demand in the local market.

As summarized in Table 1 it can be seen that the return of investment for the machine decorticated fiber, handmade paper, and handwoven piña cloth which are 29.55 percent, 45.65 percent and 44.76 percent respectively gives good returns.

### BAR's endeavor

The Bureau of Agricultural Research (BAR) is mandated to coordinate agriculture research and development activities. More so, it defines its role in the modernization of agriculture through the commercialization of mature technologies that would be of great help to our Filipino farmers and fisherfolk. The extraction of fiber from the leaves of the 'Queen' pineapple and its fabrication into cloth or paper is just another among the many mature technologies ready for commercialization that will be benefited by the farmers and of those in the marginalized and business sectors.

Being among the flagship crops of Camarines Norte, whether as a fruit crop or a fiber crop, the 'Queen' pineapple has marked its contribution to at least alleviate poverty in one of the poorest provinces in the country.

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**Table 1. Cost and return analysis**

Total Sales	4,672,928.00
▪ Machine Decorticated Fiber	2,376,000.00
▪ Handmade paper	268,224.00
▪ Handwoven piña cloth	2,028,704.00
Total Working Capital Requirement	3,419,626.07
▪ Machine Decorticated Fiber	1,833,985.00
▪ Handmade paper	184,183.07
▪ Handwoven Piña Cloth	1,401,458.00
Total Net Income	1,253,301.93
▪ Machine Decorticated Fiber	542,015.00
▪ Handmade Paper	84,040.93
▪ Handwoven Piña Cloth	627,246.00
Return of Investment	
▪ Machine Decorticated Fiber	29.55%
▪ Handmade Paper	45.63%
▪ Handwoven Piña Cloth	44.76%



# Looking at *pili* beyond its edible use

Story by Christmas B. de Guzman

Photos by Rita T. dela Cruz

The seeds or kernels of *pili* (*Canarium ovatum*) are edible nuts, thus, the words *pili* nuts are derived. However, *pili* nuts are not just for consumption. Let's first look at the characteristics of *pili* as well as its uses.

## Pili tree

The *pili* tree is regarded as an organically grown tree (without any application of chemicals, pesticides, and fungicides for the duration of growth, fruit production, and harvest). The average tree starts bearing fruits six to seven years after planting with an estimated average fruit yield of 1,000-2,000 fruits per tree. However, there are certain varieties that bear flower at three to four years after planting. *Pili* trees could grow and last for a century.

*Pili* trees vary much in their fruit-bearing capacity. The poor-bearing trees may produce 500 fruits each or less, and the high-yielding or heavy fruit producers can give 3,000 to 5,000 fruits per season. The older the tree, the more fruits it bears. It is estimated that an average tree produces 33 kilograms of *pili* nuts in one year.

***The Philippines is the only country that produces and processes pili in commercial quantity and has the monopoly of processed pili in the foreign market.***

## Pili fruit

The *pili* fruit is a drupe, 4-7 centimeter long, 2.3-3.8 centimeter in diameter and has a weight of 15.7-45.7 grams. The skin is smooth, thin, shiny, and turns purplish black when the fruit ripens. The pulp is fibrous, fleshy, and greenish yellow with a pointed shape-end hard thick shell. Within the shell is an embryo seed with thin brownish fibrous coating.

## Uses of pili

Bicol (Region V) accounts for 82 percent of national *pili* production, the bulk of which comes from Sorsogon, hence, the province has been dubbed as commodity champion for *pili*.

The processed *pili* kernel is

delicious, thus, it can be used in the preparation of many food products. It is also a source of edible oil of excellent quality for pharmaceuticals, cosmetics, and for salad dressing. The pulp of *pili* is used as vegetable, pickle, flour, puree, sauce, and feeds for swine. The shell is used as fuel, growing medium for orchids and anthuriums, and crafted as fashion accessories. The resin is used as lacquer, varnish adhesive, and manila elemi. The trunk is made into furniture and wood panels. With these various uses, there is no doubt that *pili* is considered a high-value commercial crop.

The Philippines is the only country that produces and processes *pili* in commercial quantity (Coronel, 1978) and has the monopoly of processed *pili* in the foreign market. Bicol Region is known for its *pili* candies and confectioneries which are sold in different product forms and in various packaging containers. These products are exported to Australia, Guam, Canada, Japan, Hongkong, China, UK, Korea, Singapore, Hawaii, Germany, France, and United States.

Because of its high commercial value, the nut is the most important product from the *pili*. When raw, it may resemble the flavor of roasted pumpkin seed, and when roasted, its mild, nutty flavor and tender crisp texture is superior to that of almond.

## Pili nut and the spa industry

The country's growing spa phenomenon continues to discover ways to natural wellness. One indication is a newly opened spa in Camarines Sur, Bicol, which makes use of the *pili* fruit in giving a restful







**Pulp-free pili**

experience to "spa-goers."

Pili nut has good moisturizing properties because of its high moisture content.

One of the pioneers in the Philippine spa industry accredited by the Department of Tourism (DOT), "Nurture Spa" opened its branch at the Camarines Sur Water Sports Complex (CWC). This spa chain is known for its use of local ingredients grown from where its branches are located.

Foreign or local personalities who enjoy extreme water sports at the CWC would agree that after having a long, tiring day, revitalizing spa treatments may not just be a luxury but a necessity. This need for a haven of rest in an active environment leads to a bankable niche for Nurture Spa.

Pili is an excellent antioxidant. It has good moisturizing properties. It is rich in vitamin E. What we do is we crush it to extract its wonderful properties," stated Cathy Brillantes-Turvill, Nurture Spa's chief executive officer.

As underscored by the DTI-Bicol, the only known fruit oil of commercial importance in the world market today are olive and palm oils but pili is another source of oil with big market potential useable in the manufacture of soaps, pharmaceuticals and cosmetics.

#### **Offered spa menu**

In Nurture Spa, pili is explored and used as a component in services such as facials, body scrubs, and body wraps.

The one-hour El Ray Malumoy

Facial is a natural relaxing facial of honey, pili, and yogurt capped with a soothing mask of cucumber aloe vera and an acupressure facial massage. According to Brillantes-Turvill, it is perfect in softening and moisturizing sun-burned and wind-hissed skin.

Another spa treatment is the one-hour Daraga Pili Polish, an exfoliating pili scrub that removes dead skin, followed by a mini massage using rich moisturizing aloe vera and coco-butter base.

Also introduced is the Magayon Coco Pili Body Cocoon, which is a one-hour nourishing wrap using freshly squeezed virgin coconut milk and mashed pili nuts bursting with vitamins and minerals.

#### **Sustainability of the pili industry**

Posing significance in the spa industry, pili nuts definitely have very high export potential. The demand for pili nuts is high but the supply is barely met. This is due to some limitations in the post-production operation and processing.

In this regard, the presence of Bicol Pili Board, Inc. in the region serves as a vehicle to link various key commodity players to ensure the sustainability of the industry. This is supported by the existence of organized pili growers' and pili processors' associations which can

***...the only known fruit oil of commercial importance in the world market today are olive and palm oils but pili is another source of oil with big market potential useable in the manufacture of soaps, pharmaceuticals and cosmetics.***

be tapped to produce and supply fresh, semi-processed, or processed pili nuts. With the unified efforts of the private sectors earlier mentioned and the government, development of state of the art processing equipment such as depulping machine, sheller, and oil extractor and establishment of collection and processing centers in major producing area were realized.

We have known for a fact that pili nuts can be further processed into a variety of already known confectioneries, baked products and other delicacies. On the other hand, its great prospect in the spa industry is relatively new. This in turn around means bright opportunity for growers and processors of pili nuts. 🌿



**Pili tree**



# Jackfruit in its hippest form: Vacuum fried and packaged!



*Story and Photos by Rita T. dela Cruz*

**G**race, an expatriate mom who now lives and works in Dubai, cited in her personal blog, *Sandier Pastures* (<http://www.sandierpastures.com>), 13 of her favorite scents in the world. One of them was the smell of jackfruit.

In the entry, she wrote: Jackfruit, when ripe, has the strongest and richest smell of any fruit in creation - in a good way! Just in case you were thinking of the dreaded durian smell, I promise, jackfruit is not that bad! Some mentioned that the smell of jackfruit is almost identical to the smell of rotting onions! Don't believe it. I personally think it's not true. By the way, jackfruit is probably my next favorite fruit in the Philippines (the first would be mango), not just because of the scent but because of the taste.

Even if the world does function based on relativity, food preference could still be acquired. In the case of jackfruit, the chance of people liking it is much feasible than durian.

One of the most widely grown and famous fruits in the Philippines is jackfruit

(*Artocarpus heterophyllus*) or *langka* as the locals call it. Physically, this humungous fruit is hard to miss. James J. Jarley, author of the book *Know and Enjoy Tropical Fruit*, cited jackfruit as the largest edible tree-grown fruit in the world, growing to 350-900 millimeter in length and 205-500 mm in diameter.

The fruit alone weighs up to 36 kilograms, exuding a rich yellow sweet and aromatic smell when fully ripe. In the Philippines, the young fruits are usually eaten as vegetables while the pulp or flesh (*lamukot*) of ripe jackfruit is eaten fresh or cooked and preserved. The pulp is high in carbohydrate and rich in Vitamins A and C.

## **Fried but definitely healthy**

Given today's fast-changing life wherein everything comes in packs and to go, the demand for quality ready-to-eat fruits is high. But consumers also prefer quality - preferably those that do not contain any of that artificial preservative.

If you're a fan of jackfruit but hates the trouble of manually taking out the

ripe pulp having the gummy latex accumulating on your hands, then you would be pleased to know that through vacuum frying technology, you can now have your favorite jackfruit anytime you want and in packs without compromising its healthful benefits.

It's crispy and it tastes like jackfruit! I was astonished to note my first reaction when an officemate brought a pack of Baybay Delights' Vacuum Fried Jackfruit for us to taste. Then I remembered the famous Vietnam's Vinamit Jackfruit Chips, which is a signature product of Vietnam sold in airports. Incidentally, they are also being sold in a small Vietnamese village in Palawan. Baybay Delights, on the other hand, is nowhere far from the taste of Vinamit and former is much cheaper.

Tidbits of jackfruit pulp, vacuum fried, and packed as snack healthy food. Since it was vacuum dried, the original taste of jackfruit was maintained too.

Vacuum frying technology has the potential to produce healthier snacks that offer improved taste and texture as it allows



fried products to retain its original color and flavor and produces crunchier/crispier products. The idea is to fry the fresh jackfruit under vacuum and at low temperature, maintaining more of their natural colors, flavors, nutrition, coupled with crisp taste and delicious savor.

### Dehydrated jackfruit now in packs

Dr. Lemuel M. Diamante of the Department of Food Science and Technology of the Visayas State University (VSU) in Baybay, Leyte developed the technology for the production of vacuum fried product from ripe jackfruit.

Specifically, he studied the effect of the degree of ripeness (i.e., ripe, half-ripe) and pre-treatment methods (i.e., fresh, chilled, frozen, blanched) on the physico-chemical and sensory qualities of vacuum fried jackfruit. He also determined the effect of frozen storage duration on the qualities of the vacuum fried ripe jackfruit.

To support his developed technology, Dr. Diamante carried out a pilot production of the product and conducted a test market in selected areas in Leyte. Finally, he did a breakeven cost analysis on the pilot

production in preparation for commercialization.

Results of his study showed that the physicochemical qualities of the various vacuum-fried products developed were affected by the degree of ripeness and pretreatment methods.

According to Dr. Diamante, the experiments showed that the color, texture, and oiliness of the vacuum-fried products from half-ripe samples were significantly better than the products from ripe samples. Although, when it comes to aroma, sweetness, and general acceptability, Dr. Diamante noted that the ripe samples were significantly better than half-ripe.

In terms of the effect of storage duration product from frozen jackfruit pulp that were stored for three months would still result in acceptable products and are still comparable to product from frozen jackfruit that were stored for a few days.

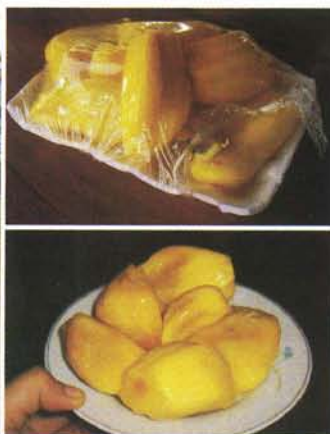
Dr. Diamante carried out three pilot productions using the developed technology giving him a mean break-even price for the 50-gram bag of

vacuum-fried ripe jackfruit of P26.92 per bag. Given a 30 percent profit margin on the break-even price, the whole price could be sold at P35.00 per bag. For retail pricing, outlets would charge P5.00 per bag bring the price to P40.00 per bag which is still competitive since a bag (100 gram) of vacuum-fried half-ripe jackfruit, sells at P75.00 only.

But nutrition-wise, customers prefer the vacuum fried ripe jackfruit according to Dr. Diamante. It's more healthful since it has higher beta carotene and ascorbic acid contents. Also, it has the sweet taste and jackfruit aroma, Dr. Diamante expounded.

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The article was based on the study, "Development of Vacuum-Fried Product from Ripe Jackfruit" by Dr. Lemuel M. Diamante, professor II at the Department of Food Science and Technology, Visayas State University, Baybay City, Leyte 6521-A. For more information about the study please contact him at telephone numbers (053) 335-2619, (053) 335-2600 or through mobile no. 0917-3064952 or email at: [Imdiamante2002@yahoo.com](mailto:Imdiamante2002@yahoo.com)

**Vacuum frying technology has the potential to produce healthier snacks that offer improved taste and texture as it allows fried products to retain its original color and flavor and produces crunchier/crispier products.**







## Prolonging the shelf-life of citrus fruits with waxing

Story by Ellaine Grace L. Nagpala

Photos by Rita T. dela Cruz

Citrus is among the most important fruit crops in the subtropical regions. Citrus varieties and cultivars are widely cultivated in at least 86 countries worldwide covering an area of 1,593,753 hectares. In 1993, world citrus production totaled about 80,000 metric tons, which is nearly the same level as bananas, including plantains. On a worldwide basis, there are five citrus groups that are of economic importance: sweet oranges (*Citrus sinensis* [L.] Osb.), grapefruit (*Citrus paradisi* Macf.), lemons (*Citrus limon* Burm. f.), limes (*Citrus aurantifolia* L.), and mandarins (*Citrus reticulata* Blanco and *Citrus unshiu* Marc.). At the beginning of the 21<sup>st</sup> century, world production of citrus reached 104,000,000 mt, indicating an increase in production of 35 percent since 1990.

Statistics on citrus production shows that citrus ranks fourth among the five major tropical fruits in the Philippines. The citrus industry of the Philippines is basically a fresh fruit domestic industry which at present is unable to fill in local demands. This is due to the devastation of citrus orchards in Batangas and Laguna caused by the dreadful leaf mottling disease in the early 1960s. As a result, local fruits disappeared

in the market and imported citrus were the ones sold. Locally grown citrus only started to reappear in the market after several rehabilitation and development actions. Commercial varieties were then concentrated on calamansi, orange, pummelo, and mandarin.

Citrus species, in general, have good keeping qualities, both on and off the tree. However, the commercial life span of harvested citrus may be reduced or terminated because of fruit decay, weight loss, shriveling, softening or overmaturity resulting in off flavor, other physiological disorders, and chilling injury during cold storage. Hence, the successful postharvest storage and handling of citrus depends to a large extent on minimizing losses from fungal decay, shriveling, and softening.

### An integral packinghouse operation

Marketing clean and attractive fruit that is free of decay and surface blemishes is one of the main concerns of citrus fruits traders.

One important aspect of postharvest handling is the packinghouse operation. This includes practices done

after harvest to prepare the commodity for the market or long-term storage (Bautista, 1990). Generally, the packinghouse operation is focused on cleaning, grading, and packing of fruits. Waxing, in the packinghouse operations for citrus, is an integral part of the handling system for citrus.

Waxing is the application of a thin film or surface coating to fruits and vegetables. The coating may or may not be wax but usually, the term wax is used synonymously with surface coatings or protective skin coatings.

In a commercial citrus packingline, washing of fruits in clean water and detergent is the primary step done to yield clean and attractive fruits. Washing is also done to remove spores or inoculum possibly present on the fruit surface to decrease occurrence of disease. However, during the washing operation, the natural wax coating of citrus is removed from the fruit. This renders undesirable side effects to the fruits which limit its marketable life. Rapid moisture loss by transpiration from the fruit surface is increased after washing operations. Respiration rate of the fruit also increases. Furthermore, washed fruit



softens quickly and gives a dull appearance.

Although mechanical refrigeration, controlled atmospheres, hypobaric storage, and other sophisticated techniques are used in industrialized countries to extend storage life and minimize postharvest losses in perishable produce, these techniques are capital-intensive and the requisite manpower is lacking or inadequate in most developing countries such as the Philippines. Moreover, citrus are chilling-sensitive, which limits the usefulness of refrigeration for extending their shelf life. For developing countries, simple and relatively inexpensive treatments such as coating with wax and fungicidal dips offer better prospects for reducing postharvest losses in citrus and other fruits.

### Effects of surface coatings

Coating of fresh oranges and lemons with molten waxes to ferment the fruit started in China in as early as the twelfth or thirteenth century. In the 1930s, hot melt paraffin waxes were applied to oranges by misting the melted wax onto brushes. Over the years, the primary rationale of waxing for citrus fruits has shifted from a desire to reduce weight loss up to achieving a brilliant shine.

Waxing primarily improves the over-all appearance of citrus. It gives a fresh, bright appearance and a high internal quality which is preserved by the wax film. The application of wax restores many of the functional properties of the original unwashed epidermis, thereby prolonging market life.

The ability of waxing to extend shelf life is attributed to the differential permeability of the coatings to  $\text{CO}_2$ ,  $\text{O}_2$ , and water vapor, which reduce metabolic rate and water loss. As a result, waxing offers the following advantages to the citrus as well as the whole fresh fruit and vegetable industry:

**Lower respiration rate.** Fruit coatings were found to be effective in reducing the respiration rate of perishable commodities. When a fruit is coated with wax, a micro-environment of modified atmosphere (MA) is created. Under MA conditions, metabolism slows down because the amount of oxygen on the micro-environment around the fruit is lower. Hence, respiration is retarded because there is lesser substrate for respiration. Fruit softening, compositional changes, and ethylene production and action resulting in retardation of ripening and senescence are also decreased.

In the study of Bayindirli and his co-

workers, a sudden decrease of respiration rate on Satsuma mandarins was observed one week after the application of Jonfresh and Semperfresh coatings. The effect of coating was seen by the sudden decrease in respiration rate after the first week for coated mandarins which stayed almost constant throughout the storage period. Almost 50 percent of the respiration rate was reduced by the mentioned coatings.

**Shelf life extension.** Several studies have shown that citrus fruits applied with wax coatings showed a longer shelf life of fruits as compared to the uncoated ones. In a study conducted by Rañeses, it was reported that waxed Ladu and Szinkom mandarins remained marketable for four weeks at room temperature. On the other hand, unwaxed fruits were marketable for only 7 to 10 days. Ben-Yehoshua also found that application of Tag coating, a coating made of polyethylene wax and emulsion, delayed significantly the deterioration of oranges. Appearance, flavor, button condition, and softening of oranges were maintained about twice as long as treated as in untreated fruits.

**Weight loss reduction.** When coatings are applied to citrus, the moisture retention capacity of those fruits is enhanced owing to the barrier created by the coating. The rate of water loss can be reduced to 30 to 50 percent under commercial applications, particularly if the tiny injuries are coated with wax.

**Improved luster.** Waxing increases the aesthetic appeal of citrus fruits by providing an attractive glossy finish to fruits. Citrus fruits untreated with wax have the tendency to develop a dull wrinkled appearance in less than a week.

**Lower disease incidence.** Wax can act as a carrier for fungicides or colorants. Occasionally, fungicides are incorporated into waxes to prevent development of disease. In a study conducted by Pelser in Navel and Valencia oranges treated with Flavorseal wax containing 2,500 ppm TBZ, the coated fruits resulted in a statistically significant reduction in total decay, incidence of *Trichoderma* brown rot and green mold as compared to fruits coated with wax only. It was also found in the study that application of TBZ dissolved in a resin-solvent wax that contains 2,500 ppm resulted in significant reductions in decay

compared to untreated fruits of Navel and Valencia oranges.

### Market implications

Several wax formulations have been developed and experimentally tested. Among these are water waxes, solvent waxes, bar or slab waxes, oil waxes and the recent sucrose eater coating. Commercially available formulations of waxes such as Prima Fresh, Sta. Fresh, Decco Luster, and Tag are also used as coatings in different commodities. Wax can be applied through dipping, foam waxing, spray waxing, and slab method.

Through waxing, the shelf life of citrus fruits can be prolonged. Citrus having an extended shelf life means that the fruits can be transported and sold to farther places. This means more that citrus growers and traders can establish more markets and gain more profits. In addition, losses from postharvest handling can be minimized since the deterioration of fruit is slowed down, and the incidence of disease becomes lower.

The added gloss to the fruit will also make the citrus fruits more appealing to consumers. Since consumers buy with their eyes, a commodity that exhibits a better visual quality will be perceived by a consumer inferior over the others.

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# Lanzones:

## A sweet and sour fruit but alone is a sweet business venture

Story by Ma. Eloisa E. Hernandez and Avelita M. Rosales

Photos courtesy of DA-STIARC

**L**anzones (*Lansium domesticum*) is considered one of the most favorite fruits in the Philippines. Its delightful sour or sweet taste feeling in the tastebuds makes a person long for it more and more even a *dagda* reaches their hands. Lanzones, has been popularly grown in Southern Tagalog, even in Camiguin, Sulu, Davao del Norte, and Zamboanga del Norte.

Lanzones is now considered as priority High Value Commercial Crops (HVCC) of the Philippines. The GMA-HVCC Program has identified lanzones, together with mango, pineapple, coconut, banana, vegetable, and rubber, as priority commodity crops. Now, festivities are organized to promote lanzones production in the country. We have the Paet-Taka-Lanzones Festival in Paete, Laguna during September and in Mambajao, Camiguin, every October of the year, among other festivities.

### Improved technologies on lanzones

In support of the growing demand for lanzones in the country and abroad, the Bureau of Agricultural Research (BAR) has supported a project of the Southern Tagalog Integrated Agricultural Research Center (STIARC) titled *Agribusiness development project of lanzones in Calabarzon* using improved production technologies.

Specifically, the project aims to increase farmers' income by increasing yield per tree through improved package of technologies (POT), increase planted area through production of good quality and affordable grafted lanzones varieties, institutionalize lanzones production through organization of farmers association, and conduct of techno-fora and seminars.

Included in the package of technologies are pruning removal of watersprouts, infested and dead twigs and unproductive branches in the interior of the tree, applying the amount and kind of fertilizers based on the result of soil analysis, and use of mycorrhizal fungi (Mykovam), control of pests and diseases by brushing off and scraping the loose dried bark and use of *Trichogramma*, and irrigation by the

farmers with good water sources.

The technology was generated through one of BAR's banner programs, the Community-based Participatory Action Research (CPAR) Project on the rehabilitation of lanzones in Brgy. San Roque, Alaminos, Laguna. Initially, there were seven farmer-cooperators in this site with the commodity mixes of lanzones + coconut + native chicken. This CPAR activity is designed to implement an integrated production management system at the community level.

Also, the Agribusiness Development Project (ADP) on lanzones in Cavite, Laguna, Batangas, Rizal, and Quezon (CALABARZON) was implemented. The research team is composed of Ms. Avelita M. Rosales as project leader; Ms. Virgilia D. Arellano, Ms. Merly K. Tuazon, Ms. Elizabeth R. Gregorio and Ms. Thelma Lambio as study leaders; Ms. Cristina Goma, Mr. Antonio dela Rosa, Ms. Gladys Apostol, Mr. Thelmo Deriquito, Ms. Luzviminda Valero as LGU collaborators. ADP is an income-generating/self-liquidating project supported by BAR being implemented by

the DA Research Stations in all the Regional Field Units. It aims to strengthen RIARC's 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.

### On rehabilitation Increasing productivity of old existing trees

According to Ms. Rosales, Paete variety lanzones is considered a niche product in Laguna. It is one of the highly prioritized fruit commodities in the province. The fruits have good eating quality and high degree of sweetness. It is usually planted between coconut trees. Bienniality of fruiting habit is usually observed in Paete variety.

Information from surveys of lanzones growers showed that lanzones production in Laguna and in Batangas is beset by several constraints such as occurrence of pests and diseases, specifically bark borers and scab; erratic climatic conditions and natural calamities; soil compaction owing to grazing animals;



unavailability of affordable planting materials, high costs of inputs; inaccessibility of technical information; and highly perishable fruits. These factors contribute to the undersupply of lanzones fruits. The group recommends further rehabilitation even on old lanzones trees and increasing the yield potential through the abovementioned technologies.

At present, there are 100 farmer-partners in CALABARZON who are using the improved lanzones production technologies. These farmers were provided inputs (not a dole-out but with repayment scheme), technical assistance from the research team, trainings, seminars, and Lakbay Aral.

### Planting of different varieties of lanzones

Varieties of lanzones grown in the Philippines are classified into *duko*, *paete*, *jolo*, and *longkong* (Thai). Generally, *duko* is shorter than the other varieties. With a considerably delectable flavor, it has a wider crown and hairless leaves.

*Paete* varieties are grown mostly in Luzon, Misamis Oriental, and Camiguin Island. *Longkong*, on the other hand, is the variety introduced from Thailand and Indonesia. Almost seedless, its fruit is sweet and tasty. One distinct characteristic of this variety is that its skin or peel has no latex compared to the others.

### Production of quality planting materials

*Sexual* or *asexual* means of lanzones reproduction can be practiced in order to develop more and different varieties.

*Sexual* production is done through transplanting and growing of lanzones seedlings. Seedlings are transplanted into plastic bags containing soil, organic, compost or decayed coir dust. Seedlings are

transplanted in the field upon reaching one meter in height.

The procedures are as follows:

- Extraction of seeds from fruits
- Soaking in water for 24-28 hours
- Removing mucilage or pulp by washing in tap water
- Sowing of seeds in garden soil; compost (1:1)
- Transplanting in plastic bags (8 x12 ) after two weeks
- Proper shading, weeding, and fertilization

*Asexual* means or cleft grafting is the commonly practiced way of propagating different varieties of lanzones. Budsticks can be collected from full-bearing trees of outstanding characteristics.

Lanzones cultivars of *jolo*, *paete*, and *duko* can be used as rootstocks. The newly grafted seedlings should then be transferred in partially shaded place or nursery with accessible water supply.

### Income benefits

Productivity of the old trees and pomological characteristics of the fruits were enhanced by using the improved POT as indicated by increase in yield of trees, increase in fruit size and weight.

The research team facilitated the establishment of backyard lanzones nurseries in Lipa City, Padre Garcia, San Jose, and Tanauan City, all in Batangas. Moreover, lanzones nurseries were established at OPA Nursery in Brgy. Lamot, Calauan, Laguna and at STIARC, Marauy, Lipa City. Good quality seedlings were sold at affordable costs.

A farmer-partner from Brgy. Bulacnin, Lipa City was able to sell 2500 seedlings worth P30,000.00 while his production cost was only P5294.44. So,

he derived a net income of P24,705.56 which he further used to purchase fertilizer for rehabilitation of existing old trees and for payment of tuition of his children.

### Establishment and support to lanzones growers

Now, the group is conducting information dissemination, product campaigns, and attending to marketing skill development as part of its marketing strategies for the technology. There are 100 farmer-cooperators of the project in 12 barangays in CALABARZON.

Through the efforts of the research team and collaborators from LGUs, Farmers Associations of ADP on Lanzones were organized in Paete and in Pakil, Laguna with 22 and 34 members, respectively.

### Market potential

Considering the geographical proximity of Laguna and Batangas to Metro Manila and other urbanized locations which serve as primary demand centers, this offers a competitive market for lanzones fruits, the group said.

Furthermore, the availability of good quality and affordable planting materials of lanzones at established nurseries is seen as a viable business venture for this industry in CALABARZON. The potential expansion areas are the neighboring regions which have similar agroclimatic conditions.

It is hoped that through R & D on lanzones, the development of indigenous capacity, whether it be in identifying and adopting technologies, enhancing the farmers entrepreneurial capabilities and improving the status of the lanzones industry towards both domestic and globally competitive market can be facilitated. 🍌





# Bullish on the natural rubber industry

(Finding the silver lining to endless oil price hike!)

Story by Miko Jazmine J. Mojica  
Photos by Ricardo G. Bernardo

Fluctuations in crude oil prices and their impact on the world economy paint nothing but an ugly scene to most of us. Yet for producers of natural rubber, there's a reason to be thrilled.

Mr. Sang Udomjarumani, CEO, International Rubber Consortium Ltd (IRCO), presented an analysis of the Price Outlook for Natural Rubber 2008/2009 at the 4<sup>th</sup> ASEAN Rubber Conference (ARC) hosted by the Philippines at the Crowne Plaza, in Pasig City on 5-7 June 2008. In his presentation, he said that if high energy prices continue, the cost of producing synthetic rubber would become more expensive and thus lose its competitive advantage to natural rubber.

According to the Rubber Manufacturers Association, synthetic rubber is produced by combining gases which are derived from petroleum by-products ([www.rma.org](http://www.rma.org)).

Mr. Chan Weng Hoong, principal research officer of the Malaysia-based Advanced Agri-Ecological Research, concurred when he presented in the same

conference his paper on the commercial sustainability of natural rubber vis-à-vis oil palm. He said that with the price of crude oil crossing \$100 per barrel which is expected to get higher as fossil fuel reserves deplete with time, natural rubber would likely eat into the market share of synthetic rubber, thereby increasing the demand for the former. He likewise cited the report of the International Rubber Study Group (IRSG) which said that the global requirement for rubber is presently supplied by synthetic rubber (SR), 60 percent; and natural rubber (NR), 40 percent.

## World natural rubber industry

Not only in terms of cost efficiency does natural rubber production advances. Asia continues to be the biggest source of natural rubber in the world. In the Price Outlook for Natural Rubber 2008-2009 presented by Mr. Udomjarumani, an annual growth rate average of five percent since 1990 is experienced by Thailand, Malaysia, and Indonesia, the top three producers of natural rubber in the world.

The three countries produce 71.5 percent of total natural world production.

The other major rubber-producing countries include India, China, Vietnam, and Sri Lanka. The Philippines and some countries in Africa and Latin America also have natural rubber industries. On the other end, the top 10 natural rubber consumers of the world are China, USA, India, Japan, Malaysia, South Korea, Thailand, Indonesia, Germany, and France.

## Managing supplies and expansion

To prevent saturating the global market and at the same time ensure adequate supply, Mr. Udomjarumani said that Thailand, Malaysia, and Indonesia have come up with measures such as replanting, rezoning, diversification, value creation, surveillance, and regional cooperation to sustain the growing natural rubber industry. The following non-tripartite countries and their rubber expansion programs/industry situation were cited by the Price Outlook report as follows:

- Vietnam aggressive planting programs, including ambitious expansion plan to



neighboring countries such as Laos and Cambodia.

- Cambodia – plans are in the works for plantation projects sponsored by Vietnam, China, Malaysia, and Thailand.
- Laos – large plots of virgin land are leased to the Chinese, Vietnamese, and Thais for rubber. Disputes with local residents over land ownership are on the increase.
- Myanmar – investments on rubber mainly come from China.
- China – owing to constraints of suitable land for rubber, the government is encouraging Chinese investors to establish production bases in other countries, including Laos, Myanmar, Cambodia, Indonesia, and Africa.
- Philippines – ambitious plan to expand plantation acreage to one million hectares within 10 years.
- India – steady growth, aiming for self-sufficiency. Land constraints may limit future expansion.
- Africa – big potential given political stability. Its proximity to Europe is a geographical advantage over its Asian counterparts as far as the European market is concerned.
- South America – owing to proximity to North America and the high rubber prices, big tire manufacturers such as Goodyear or Michelin are looking into potential rubber growing.

### National Rubber Development Program (NRDP)

At a press conference before the ASEAN Rubber Conference, Agriculture Secretary Arthur C. Yap reported: "To meet the requirements of the future, as global consumption [for NR] is expected to reach 31.8 million tons by 2020, the DA is focused on its the National Rubber Development Program (NRDP) to expand the current area planted to rubber totaling 92,000 hectares to one million hectares, and increase production and exports to \$960 million all by 2020. Such expansion, which is on top of our immediate goal of replanting 36,000 hectares, is expected to create at least one million jobs for plantation workers, tappers, and processors. Today, expansion initiatives are underway in several provinces identified as viable areas for rubber production. These areas include Sultan Kudarat, Isabela, Maguindanao, Benguet, Camarines Sur, Palawan, Antique, Negros Oriental, Negros Occidental, and Mindoro Occidental."

Given the lucrative market offered by the global rubber industry (unprocessed and

processed rubber are sold locally at P100 and P150 per kilo, respectively at farmgate), the DA is mindful of challenges that the Philippine rubber industry must overcome in order to sustain its profit. Some of these were enumerated by DA Undersecretary Jesus Emmanuel M. Paras when he delivered the message of Secretary Yap as keynote speaker in the ARC 2008:

- Most of the Philippines' rubber trees are now either senile or nearing their maximum productive years.
- Most rubber plantations are in mindanao, which are burdened with security and peace and order issues.
- Growers are burdened by high production expenditures owing to rising costs of labor and other inputs.
- Difficult access to sustainable credit and loans has to be addressed.
- There is a need to strengthen the national research, development, and extension system from which future advances and development must be anchored.

The Bureau of Agricultural Research (BAR) is specifically tasked to lead the research and development (R&D) component of NRDP and give support to its extension activities. BAR is currently supporting the technology commercialization of 10 recommended rubber clones in the country through technology promotion and demonstration in suitable rubber areas nationwide.

### Global price outlook for natural rubber in 2008-2009

According to the report of Mr. Udomjarumani, the likely increase in the price of rubber (bullish factors) for 2008-

2009 could be related to the continued strong economic growth of China and India which are expected to spur a greater demand and a higher price for NR. Moreover, the report predicted that investors will deem the commodities sector a safer haven compared to other financial markets. If this happens, investors are likely to invest their money in the commodities market, thus creating a more liquid rubber market.

On the negative side (bearish factors), if the US recession spills over to other countries, a global economic slowdown is expected. The already weakened export to the US caused by the US recession may curb the demand for NR. Subsequently, the stronger currencies in Asia make the exports from the region more expensive and less profitable. Although the price outlook reported a growing tire and vehicle sector, it also pointed that "further crude oil price hike may discourage people from buying cars, thus reducing demand for tires."

### Caution

Although NR has enjoyed a continuous six years of price boom, Mr. Udomjarumani cautioned that the unprecedented price boom may be misleading. He explained: "Some producers may get carried away with the wrong understanding that rubber price will remain high and can never come down. The boom and bust cycle will repeat itself if every country continues to pursue its own rubber planting policies without consultation. Only regional cooperation can prevent the world from facing another price bust similar to the one experienced in 2001." 🌱





# Abaca: Filipinos' fabric of life

Story by Rita T. dela Cruz

Photos by Rita T. dela Cruz and Miko Jazmine J. Mojica

If the Thais have silk, Filipinos have abaca (*Musa textilis* Nee), the champion of the Philippine fiber industry, or *Manila hemp* to the international community.

Abaca remains to be one of the most endemic treasures of the Philippines being favorably competitive over the abaca produced by Ecuador, the only other commercial producer of abaca in the world.

In a paper titled, "The Competitive Advantage of Philippine Fibers in the International Market: A Learning Experience," presented by Administrator Cecilia Gloria J. Soriano of the Fiber Industry Development Authority (FIDA), she detailed some of the competitive advantages of Philippine abaca in the international market.

The Philippines being the lead exporter of abaca fiber, continues to contribute and sustain the country's economic growth and development, according to her. Likewise, the industry remains as one of the country's major sources of employment and foreign exchange earnings. She cited that abaca sustains more than 1.5 million Filipinos who directly and indirectly depend on abaca for their livelihood.

Currently, there are 135,958 ha planted to abaca spread in almost all parts of the country giving livelihood to 82,450 abaca farmers. Annually, the country produces an average of 69,118 mt of abaca fiber. From this, 24 percent are exported in raw form while 86 percent are locally processed into pulp, cordage, and other fiber crafts. Most of these processed products like pulp are also being exported, earning for the country US \$79 million a year.

Eighty-five percent of the abaca production is monopolized by the Philippines while 15 percent comes from Ecuador. The abaca of the Philippines has two strong points compared to the abaca produced by the rival country. In terms of application and marketability, the Philippine

abaca has considerable edge and quality-wise, it is more competitive and preferred than the abaca of Ecuador.

According to Soriano, Philippine abaca has nine grades for each type of cleaning compared to the five grades of Ecuador. As a result, Philippine abaca presents a wider spectrum of quality requirements and answers the various needs of different manufacturers like the papermaking business.

While opportunities for Philippine abaca continue to open and serve as good market potential for the country, there are also threats. One of these is the threat posed by Indonesia. According to Soriano, there are reports that Indonesia is currently developing more than one million ha of abaca plantation with Filipino experts as consultants. Whether there is truth to this or not, Soriano cautioned the Philippine abaca industry should not to be too complacent. Instead, it should strive to maintain its dominance and supremacy in abaca trading.

In the paper, Soriano highlighted the recent developments of new end-use of abaca fiber that could further heighten the country's competitive advantage in the world market. Topping the list is the use of abaca fiber in the automotive industry particularly in Germany where it is being used in the outer cover of the spare wheel compartment on the three-door version of the Mercedes-Benz A-class. According to the report of Soriano, using abaca instead of fiber glass would bring primary energy savings up to 60 percent and would significantly reduce carbon dioxide



emission. For this technology, the German car company would need some 70,000 mt of abaca fiber a year.

Another innovative end-use for abaca is a research result showing the effectiveness of the fiber as composite material for the construction of boats.

Meanwhile, the enzyme of abaca is now being widely used in cosmetics, particularly in the production of organic, hand-crafted therapeutic skin care products like abaca soap and beauty creams. Soriano revealed that abaca soap, which has anti-aging and therapeutic properties, is now marketed in the United States, Japan, and even in Europe.

A pivotal moment for the abaca fiber industry is the passing of Republic Act 9242 which allowed market opportunity to penetrate into the local textile industry. RA

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# Yap on efficiency of rice production: Some critical observations

(last part)

by MANUEL F. BONIFACIO, PhD\*

It must be mentioned that agriculture development is action oriented viewed in terms of an organized activity of a community. It has its own culture and tradition. Hence, it is important to see how agricultural production is being carried out by the community. Any intervention to be implemented must be proactive in orientation. Instead of viewing production negatively, the point of entry must be based on the action being carried by the community.

The intervention must not be linear in orientation but must be multi-dimensional in nature where improvement, innovation and change are taken simultaneously. In the long term, the community must be committed to a planning scheme that combines *doing the right things and doing things right*.

It is clear, therefore, that to raise the efficiency of production is more than a technical issue. It is, in reality, a cultural and an attitudinal issue. This is best captured in the current production practices. In view of the limited access to resources especially those involved in small-scale production, their production attitudes are fatalistic and their value orientation is focused on fate. What is needed is to turn around their production practices from *fate* to *faith*. In other words, what is needed to do is this: through the collective action of farmers, their *best practices* are organized and made complementary to attain higher level of efficiency.

This is truly beginning from where they are and with what they have. The approach is actually one of confidence-building. The beginning of a new consciousness will emerge from this confidence-building. This will be a realization of their collective strength and this will be used for creating a new center of efficiency in the community. It should be noted that the approach being suggested here is *not to begin from a technical intervention as such but from the current*

*practices – best practices of farmers and demonstrating that they can do production better and more efficient!*

This approach is important in the sense that it begins from a well-structured social preparation scheme. More than anything else, the farmers must be structurally prepared to embrace new tasks in relation to production. It is at this point, that the support systems must be designed responsive to the new confidence of farmers and that their best practice can be made better.

It is here where research and extension will play their most critical roles. Both must be very sensitive to the needs of the farmers not as individuals but as a community of farmers. Their complementation must be enhanced and therefore, research must be focused on action research – it must be focused on continuous improvement of the production system and as necessary, innovations must be introduced to further enhance the system of best practice. Through action research, technical intervention becomes instrumental in institutionalizing and expanding farmers' best practice and the management of production is therefore streamlined and made more efficient.

In this case, the role of extension becomes very different. It is no longer merely intended to educate farmers and their communities as in case of farm demonstrations focused on technology transfer. It will no longer perform the role of extending knowledge to the farmers. It will adopt a *critical perspective* on the dynamics of agricultural development. It will be a dominant carrier of farmers' interest, issues, concerns, problems, etc. In other the words, the new extension worker will be steep in his knowledge of the phenomenology of production.

This phenomenological knowledge will be organized based on the framework of resource management. It will be holistic and systems- oriented. There is no other

agency that could be more strategic in terms of feedback system than the extension workers who are not only in contact with farmers but are keen observers of farmers' practices. Armed with resource management framework, the extension workers are no longer a bearer of knowledge to farmers but more of an information manager trained in the use of ICT.

Armed with organizational development and management knowledge and skills, the new extension workers will work closely with farmers as an organized group facilitating and enabling them to have access to the best support systems to enhance their production efficiency. With this new orientation toward more efficient production system, the new extension worker will therefore be responsible for the shaping of a new management system with the right attitude through the adoption of a value system geared toward efficiency and these are: Commitment, Responsibility, Accountability, Trust, Efficiency and Discipline (CRATED)

It is through the adoption of these values that the current community of practice of farmers will undergo transformation to be more result orientated and will, therefore, be more efficient.

It is hoped that in the foregoing discourse, it has been demonstrated that the idea of making production efficient cannot be treated in isolation. It must be placed in its most appropriate context and this is resource management. Without any doubt, agriculture must be treated as business and for it to be competitive it must be information-driven and must always undergo rigorous planning programming, budgeting, monitoring and evaluation. This is the only basis of claiming production efficiency. 🌱

*\*Professor emeritus of sociology at the University of the Philippines Diliman and consultant at the Bureau of Agricultural Research, Department of Agriculture, Quezon City.*



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**HARVESTING THE 'SWEET' PROFIT FROM MANGO.** Tiblawan farmers from Governor Generoso, Davao Oriental harvest Carabao mangoes from the two-hectare farm, which was originally a corn-based area. Planting mangoes offers a bright future for the farmers and the community providing the locals livelihood and extra income.

BAR envisions a stable and progressive future for the Filipinos through excellence in research and development (R&D) in agriculture and fisheries, specifically to transform the agriculture and fishery sector from a resource-based to a technology-based industry. In doing so, BAR through the Department of Agriculture-National Research and Development System for Agriculture and Fisheries (DA-NaRDSAF) must develop knowledge, methods, and technologies that can make the industry competitive and efficient.



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