

Abaca industry
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big income earner



BIO LIFE

JULY - AUGUST 2008

Guide to
successful
Moringa
establishment
(dry season)

Cashing in
on

CORN

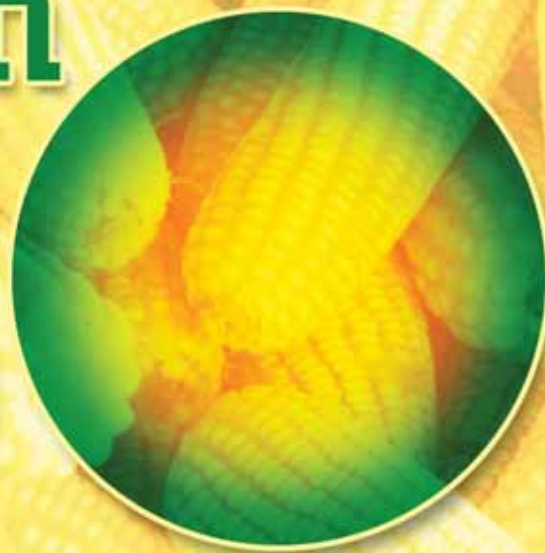


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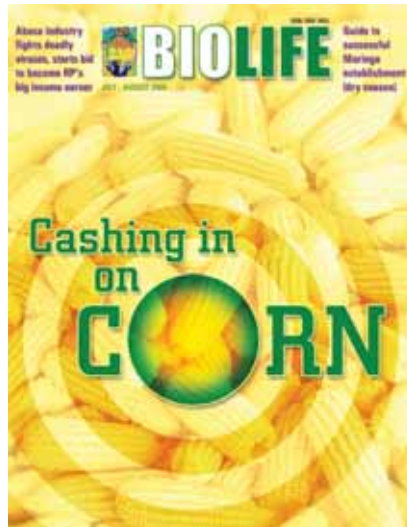
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Telephone (632) 4137293.
Fax No. (632)3728560.

E-mail: info@biotechforlife.com.ph
Website: www.biotechforlife.com.ph

Joel C. Paredes, editorial director • **Lyn Resurreccion**, associate editor
Benjo Laygo, art director • **Nanie Gonzales**, associate art director • **Dr. Edita Burgos** and **Abe Manalo**, editorial consultants • **Leonilo Doloricon**, art consultant • **Manman Dejeto**, photo consultant • **Ann Burgos**, **Paolo Capino**, **Angelica Carballo**, **Ian Go** and **Lia Mañalac**, writers • **Menchu Bon**, **Ressie Benozza** and **Rhoda Yumang**, editorial staff

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The wonders of biotech

WHILE the country is being buffeted by rising food prices and zooming costs of fuel, the natural recourse of many people is to ask the basic question: Why?

This is but natural considering the appetite for gas-guzzlers and the mistaken notion that the price of food would not skyrocket, both of which views are mistaken and ignorant of the fundamental happening in the world today.

It is not only Malthus who posited the view that population growth would outpace food production but also the millions of Filipinos who had long held the opinion that more children are not a liability but an asset, and that God, in His infinite mercy, would always provide.

Platitudes are platitudes and they all rot when reality sets in, when the here and now tells them that the world is not a boundless universe but a finite entity that can only accommodate so much resources and just so few creatures.

Thanks to science, the debate has been delimited, and more and more people now understand that the parable of the old times may not be relevant in a topsy-turvy world where more and more nations have to retreat from a globalized Eden to the grim concrete reality of a pauperized nation.

Indeed, runaway food prices worldwide underscore the need for each nation-state to take stock of the risky business called food security.

This assumes graver proportions when we realize that only 7 percent of global rice pro-

duction is sold in the export market, and more and more countries are now jealously guarding their rice paddies with the assiduousness of Secret Service officers securing the White House, or the soldiers manning the ramparts of Fort Knox.

Evidently, the Philippines has to take stock of these developments to craft a policy that would lead to higher productivity not only in rice but also in corn, the staple of the P40-billion poultry industry and also the multibillion livestock industry.

Food security requires us to produce more rice and also more yellow corn if we are to feed ourselves and crawl away from the crippling impact of rising food prices that had already compelled 29 states to



NEIL DOLORICON

limit their food exports.

It is on this score that we have to confront the value of biotechnology, which has been largely responsible for the increase in the production of precious yellow corn, the crop that ensures there are sufficient eggs for Filipinos and a higher volume of beef and poultry for the consumption of an animal protein-denied nation.

We rue the fact that world suffers because of the double whammy of higher food and fuel prices, but we also have to admit the glaring fact that we have to move fast to increase yield and end a food policy that relies on imports.

The time to act is now, and the time to use biotechnological advances to better feed ourselves and our offspring cannot be put off for tomorrow.

Cashing in on

CORN

By **JOEL C. PAREDES**

IF we can't beat them, join them. For now, that's the only reason why Salvador "Butch" Umengan, executive director of the National Corn Competitiveness Board (NCCB), is proposing that we should start exporting corn.

Ridiculous? Maybe not. While the world price of corn continues to increase, local farmers are getting miserable as ever, with farm gate prices still at tail end despite a surge in the prices of meat, poultry and practically all food products dependent on the yellow grain.

But Umengan believes that the country can still become competitive, now that there is also an emerging shortage world supply because of the demand in corn for biofuels. "We just have to fix some abnormalities in the market," he says.

It is really ironic that corn is still pegged at P11 per kilo although corn growers say that increasing it by P2 is already their "happiness level," when it has already

reached P16 in the United States, the country's main source of corn imports along with secondary sources like Brazil, Mexico and Argentina.

"So the only way corn growers can increase the price of corn is by trying to start exporting it," says Umengan.

Local corn production has actually posted "modest gains at best," says NCCB, which groups together industry leaders and growers nationwide with the goal of amassing corn production efficiencies.

According to the Department of Agriculture (DA), corn production in 2007 yielded 6,736 million metric tons, compared to 6,082,109, or an increase of 10.7 percent. This year, government projects a total of 7,387,408 metric tons for 9.66 per cent growth.

The use of corn has been varied, although it is the major requirement for swine and poultry feeds (yellow corn), food (white corn for staple and yellow corn for manufacturing) and corn produced for seeds (hybrid).

True, the country is still short of about

600,000 metric tons, but if the trend continues, we would expect self-sufficiency in corn production by 2010.

Dr. Artemio Salazar, who is now based in Los Baños as deputy director of the University of the Philippines Crop Science cluster after heading the DA's Ginintuang Masaganang Ani's corn program, says that with the Americans experiencing shortage in corn for food and feed with the increase in the demand for biofuels, he wouldn't be surprised if the United States would finally stop exporting corn this year.

Wheat and soya are already being replaced by corn because of the surge in the biofuel industry in the United States, says Salazar.

"If that is the situation, we would expect an increase in prices of food, and it started with corn," he says. "Now if the price of corn in the world market is high, then feed millers will say let's import an alternative. But what can we import that would be cheaper?"

For one, Salazar expects that wheat will

follow since corn is slowly taking over the wheat and soya fields. US federal assistance has been heaped on corn growers and many acres of land planted to wheat and soya are now brimming with corn.

The two experts agree that that the country should seriously consider its 2010 timetable for self-sufficiency in corn. That is, we don't want to experience the same problem in rice with the Philippines embarrassingly being tagged as the largest grain importer while its neighboring countries have become major rice exporters.

Umengan, however, says that he doesn't see anything wrong if the price of corn is pegged at P13. Fertilizers have more than doubled their retail prices, and that could affect the farmers' income since it comprises 40 percent of the P45, 000 total estimated cost of corn production.

On the other hand, while corn comprises about 50 percent of the volume in feed production, it is actually 20 percent or even less than the total production cost in the swine and poultry industries.

"Now that corn production continues to surge, it only points to the fact that is a lucrative venture in farming," he says.

He says that if the farmgate price for corn is increased to P13 that would mean P65, 000 pesos in gross earnings. If farm cost is at P45, 000, then there is about P20, 000 for the farmers. "That will convince the farmer to continue to plant because that's the happiness level for him. But at P10, 000 per hectare that would only result to P2, 500 per month during the four-month period. They will no longer plant."

'Quality' first

Salazar says it's not that easy to get things done. For instance he finds it unrealistic to push for agricultural modernization without first looking the "quality" of the corn yield, to make it competitive not only to imported corn in terms of yield.

Hybrid corn already averages 7 tons

per hectare, but sad to say, the climatic conditions in the Philippines has greatly influenced the quality of our yield.

"Most of the time, the rainfall is high in most times of the year," he explains. "But corn is a rain-fed crop. Basically, you don't need irrigation although a few hectares are already planted in irrigated areas. But they account for very little."

In the Philippines, 60 percent of corn production comes during the rainy season simply because it has always been a rain-fed crop. "The problem is when you plant during the rainy season, often you also harvest when it still rains. The corn's quality drops because fungus in corn is more active when the crop is wet or moist," Salazar points out.

"That is also the reason why we could hardly improve our (corn) industry because we have a problem with our post-harvest. Most of our corn is harvested when it rains and this brings down the price."

According to Salazar, even if there is now a big demand for hybrid and genetically enhanced corn varieties, it would really be difficult to address the problem of



UPLB's Dr. Artemio Salazar



NCCB executive director Salvador "Butch" Umengan

quality yield, unless government invests in post-harvest facilities.

Unlike in the United States that harvests corn in autumn, the humidity is 60 percent, compared to the Philippines at 90 percent, making it more difficult to dry the yield.

He says that when corn is harvested here in August, which is part of the wet season, farmers would naturally have a difficulty in the drying process in the absence of post-harvest facilities. During processing and storing, there is always the problem of water, and it is a big disadvantage for the Filipino corn growers.

If they start in October, there is good rainfall, and they could harvest it in the dry months.

"The big difference is in the US, they harvest during autumn, when it is cold and dry. They also have low humidity, compared to ours, that causes the corn to dry fast," he says.

Since farmers could not afford mechanized drying facilities, he says that corn would remain only profitable when planted during the dry season months, which starts in October. He says that this also explains why there is a shortage of quality seeds during the dry season.

But Salazar says that to boost production, it is already a common practice now that after farmers harvest their rice, they

start planting corn instead of the traditional legumes.

“The Filipino farmer is not lazy. They are industrious and are enterprising by nature,” he says.

This explains why farmers are also looking for quality seeds, including those that have been genetically enhanced.

Salazar says that he is not really encouraging farmers to substitute their rice with corn, now that they are looking at a more profitable yield in corn.

He says that what he is proposing is for the farmers who do not have sufficient irrigation should start planting corn.

Corn production, doing well

Meanwhile, the first quarter of 2008 alone, corn production grew by 17 percent. Actual land planted with corn also increased by five percent in hectareage, says DA Assistant Secretary Dennis Araullo, Coordinator of the National Corn Program.

“Many have shifted to corn, particularly in the northern part of the Philippines. Those who used to plant tobacco have shifted to corn and the same goes with those who used to plant tomatoes.”

A total of 677,754 hectares are now planted with white and yellow corn, 5.36 percent higher than the 643,274 hectares during the first quarter of 2007.

The DA expects an even higher increase of 24 percent growth rate for corn for the second quarter of the year.

“Without the growth of corn, the growth in agriculture may not be that good,” he says.

Of the over 600,000 hectares planted with corn, at least 500,000 hectares are devoted for hybrid yellow corn while 100,000 hectares are planted with *Bacillus thuringiensis* (Bt) corn, the first genetically modified crop commercialized in the Philippines.

Araullo says corn farmers have shifted to hybrid yellow corn because it has in-

The future looks bright

CONFIDENCE. That’s what PhilMaize president emeritus Rosalie Ellasus exudes with the way she talks about the present and future of the country’s corn industry.

“Filipino farmers are very wise,” she quips, and indeed, a bright future awaits our farmers with the help of the government, proper education, and of course, *Bacillus thuringiensis* (Bt) corn.



Rosalie Ellasus

She said that according to surveys, corn technology really boomed, not only because of technology but because of support from the Department of Agriculture (DA). Together with the Bt corn, post-harvest facilities and incentives that motivate farmers, we can achieve – and sustain – the corn industry.

But like other industries, it also faces many challenges, first of which is the price of the seeds. “Financiers make it hard for the farmers,” she said. “If they go to the financier definitely *magkakaroon ng mark up at saka magkakaroon ng interes* monthly.”

Second is the shortage of Bt corn seeds. According to seed companies, the demand for Bt Corn seeds was not anticipated to reach the level where it is now. “*Hindi nila inasahan na malaki ang adoption ng Pinoy farmers, naging massive (ang demand) eh. Nakita nila ‘yung outcome ng kasama nilang farmer kaya maraming*

creased their yield. Thus, in turn, it significantly helped them earn better.

“The bottom line here is that we will earn. If you are a farmer, will you have a profit? Why would I plant (GM corn), will I profit from it?”

For example, he says open-pollinated varieties (OPVs) of corn can only yield up to two metric tons, whereas a hybrid yellow corn can give a farmer up to five metric tons.

Araullo says corn farmers’ acceptance of hybrid corn varieties is increasing. “They are more than willing. First, it’s because of the yield per hectare. Although it is more expensive compared to ordinary seeds, it will give you a better income.”

Under the regular program of the government, it is subsidizing 50 percent of corn seeds for farmers. These seeds are

priced at P1,000 per pack. Under the special program, subsidized seeds are at P2,400 per pack.

But he says subsidies for corn seeds are done on a one-shot deal just to encourage them to plant. “They will be given the free seed, but next season they have to buy so we can transfer the program to other areas.”

Propping up the corn industry

The DA has also allocated an additional P325 million for the National Corn Program to intensify corn production within the next two years.

The additional budget will be used for developing new areas for corn, and for drying facilities to ensure its quality.

For this year, Araullo is looking at an additional 75,000 hectares of new areas for corn development. Of these, 52 per-

for **CORN** growers

sumunod, nagkulang tayo sa seeds.”

Also, the high price of inputs – fertilizers which has gone up to more than P2,000 per bag, the incessant rise of fuel prices and labor cost – and of course, the natural calamities brought about by the weather and global warming.

But aside from that, Ellasus believes that the corn industry will sustain its growth. “Especially *pag nag-intervene ang* government. Yesterday, we had an interagency meeting at DA, and PhilMaize is asking for a support price of P13 from NFA.” She believes that this will motivate the farmers to plant corn.

The increasing demand for *Bt* corn seeds is a clue of how fast the industry is growing. The demand for seeds is growing and the planting of *Bt* corn seeds has helped the country somewhat to fill in the deficit. Ellasus reported that back in 2003, our corn deficit was 1 million metric tons in the livestock sector, but due to the country’s adoption of *Bt* corn, this deficit decreased to only 800,000 metric tons (MT) in 2005 and to 600,000 MT last year. “In several years, we can break even or even have a surplus,” she said. But this will only be realized if, according to Ellasus, we can motivate the farmers to plant in spite of the peaking price of fuel and fertilizers.

She also sees the Philippines becoming an exporter of corn in the near future. The decreasing amount of deficit plus the increase of production will surely create a surplus by the year 2010.

With proper education, government assistance, good weather and *Bt* corn, indeed, the future of the corn industry looks clear and bright. (*Angelica G. Carballo*)



Asst. Sec. Dennis Araullo

cent will be in Mindanao, because of its strategic location and the favorable weather there. In Sara, Iloilo, 15,000 hectares of idle land have already been developed for corn farming. In late May, the province of Aurora also opened 5,000 hectares of idle

land for corn development.

“We don’t want to have a conflict with rice production. That’s why our corn program is focused on new area development,” says Araullo.

Because corn is now a viable commercial product that has increased the ordinary farmers’ income, the DA admits the growth of other crops have been hampered. That is why they will now recommend the use of corn as an intercrop to other crops, just like coconut.

White corn, used for human consumption will be intercropped with coconut under a joint venture of the DA and the Philippine Coconut Authority.

“When white corn is introduced in rain-fed areas, there will be a conflict with rice, and we don’t want that to happen because we lack rice. That is why our focus

under coconut, is to intercrop with coconut. Our target is 100,000 hectares for white corn for 2008, additional area. And we are expecting a production of 200,000 metric tons.”

Another project is the establishment of drying facilities nationwide.

Araullo says drying facilities are important to ensure the quality of corn. The DA wants farmers to sell corn on cobs in the market.

He says setting up drying facilities will also be useful to corn farmers, especially during the rainy season.

“At 105 days after harvest, if the corn is not dried well, during shelling, the harvest will be crushed. So you have to dry it first. When you harvest, it is already a little dried. When you bring the corn to the sheller, it will be ok. But when it rains? You cannot shell because the corn is moist. So we recommend a drying facility that you can use to dry corn in cobs.”

At present, there are already four drying facilities in place, while 46 are also being set up. But the National Agribusiness Corporation (Nabcor) is also planning to set up an additional 50 this year.

By that time, Salvador Umengan says that at least three million metric tons of quality grains have been processed through modern post-harvest facilities.

Umengan says that if government and the private could really modernize post-harvest facilities, then there can be no reason why the country can be competitive in the world market.

He remembers that in the 1990s corn was even classified as a “poor man’s crop,” having been belittled by the influx of hybrid rice, and the farmers income could hardly make both ends meet.

Today, Umengan he says that at least corn is getting its much-needed share in agriculture. “Corn is now is a semi-elite crop.” (*With a report from Lia M. Mañalac*)

Goin' bananas over the once lowly *saba*

It's a 'simple' fruit that can help solve RP's food problem

By **JOEL C. PAREDES**

THEY say you can't eat bananas all the time, but why not?

Take it from Dr. Renato M. Labadan, a Cornell-trained agriculture scientist, who finds this once lowly banana variety *saba* could just be the "miracle" fruit that could help solve the country's tight supply of rice.

"This is the only banana that you can preserve, cook in many ways and it can definitely help ease poverty," says Labadan.

Indeed, Labadan is not only suggesting that people start developing their own *saba* plantation in the countryside if they want to cash in on food. He says the best place to plant them would be in the urban areas where there is a "guaranteed market."

Saba, sad to say, could never get into the foreign market, which is now being dominated by the Cavendish variety, which is hardly consumed locally, but is country's second largest export.

For one, the Japanese would not want to import *saba* because of its discoloration and black spots. American

consumers, on the other hand prefer the yellow fruit varieties so abundantly marketed for raw consumption.

That only shows that the foreign market is after the fruit's aesthetics, although he finds *saba* as one of the most delicious—and economically viable — banana varieties.

Just recently, Dr. Labadan confides that he helped an entrepreneur -friend who bought 20,000 seedlings from Mindanao to jumpstart his own *saba* nursery in Hermosa, Bataan, realizing its potential market in the local food industry.

For his part, the 73-year-old scientist says he has been busy making the rounds of Metro Manila officials, convincing them to promote urban farming if only to help ease possible food shortage in the metropolis.

For instance, Quezon City Mayor Feliciano Belmonte and Vice Mayor Herbert Bautista have already endorsed *saba* as a major crop in their "Halaman sa Bakuran" project, which aims at propagating edible fruits and vegetables near the city's sidewalks and vacant areas.

'Fruit of the wise'

Early this year, an old campus cabal at the University of the Philippines, calling themselves The Banana Club, even erected monuments to the coming "Age of Wisdom" by planting exactly 100 seedlings of the "Fruit of the Wise" consisting of 20 seedling each of *saba*, *lakatan*, *lagkitan*, *latundan* and *bungalan* in a garden beside the UP Alumni Association Hostel in Diliman, Quezon City.

Labadan says he wasn't surprised that old UP alumni members, just like him are paying tribute to the fruit. Just like him, most UP students wouldn't have survived their college days, if not for their daily meal of banana cue or *turon* (banana rolls) in the campus.

"So if we don't start planting *saba* now, we might just be on the losing end," Labadan warns. "And I don't mind our country being called a 'banana republic' if it could solve the malnutrition problem."

In Africa and certain parts of Central America, the people have been used to eating daily the plantain, a larger and more angular banana variety which, like



the local saba, is also intended for cooking.

Some Filipinos now consider saba as their staple food by cooking it — either green or yellow ripe — similar to potatoes. Although the raw saba may not pass export standards, Sagrex Foods, a Davao-based food manufacturer and exporter, found the Banana “Pinoy” Fries and the banana rolls to have a big demand in the foreign market, and they are made from the native saba variety.

According to Labadan, the saba is really “a very simple plant that can be propagated almost perpetually.”

Indeed, it is a plant, although

erroneously mistaken as tree, when it is really large herb which could reach as high as 20 feet to 25 feet.

Labadan says saba, having originated in Southeast Asia, is one of the 57 banana cultivars in the country that can adapt to almost any soil, and are available all year round.

This makes it possible for the city folk to plant saba in vacant areas in their subdivisions. After 18 months, he guarantees that it could generate at least four to six shoots that could now be planted regularly. It is also drought-resistant, having as much as 85 percent water in content, although it is an easy target for a strong typhoon.

Economics of saba

“If you have 1,000 plants per hectare, you end up with 1,000 hands. One clamp will have 10 to 20 hands or at least 100,000 fingers. If one saba costs only P1, then it’s P100, 000,” Labadan explains.

He says the farmgate price is usually P1 per saba, and normally buyers would get it from the place, and since the farm could be in the city, it would now be easy to sell it cheaply.

But Labadan, a retired entomologist, or one who treats plants of insects, says that it would be good to start planting materials that are tissue-cultured since this would ensure that the plant is virus-free.

“For me it’s the overriding thing. It’s also faster (to grow), and they can get quantities of planting materials,” adds Labadan.

He says that tissue-cultured saba, which is ready for planting, costs about P30 per seedling.

He recommends line planting of saba at a 4x5-meter distance between the plants, and then in east-west direction. “This is the setting of the sun and it only shades one plant,” he says.

Labadan points out that while waiting for the saba to mature, the area can be intercropped with two to three kinds of vegetables. Planting camote, for instance, could help control the weeds in the urban farm.

The ripe fruit can also be pureed, candied and preserved in various forms when not eating it fresh. Its extract can be used in the manufacture of catsup, vinegar and wine. The unripe fruit is powdered and chipped.

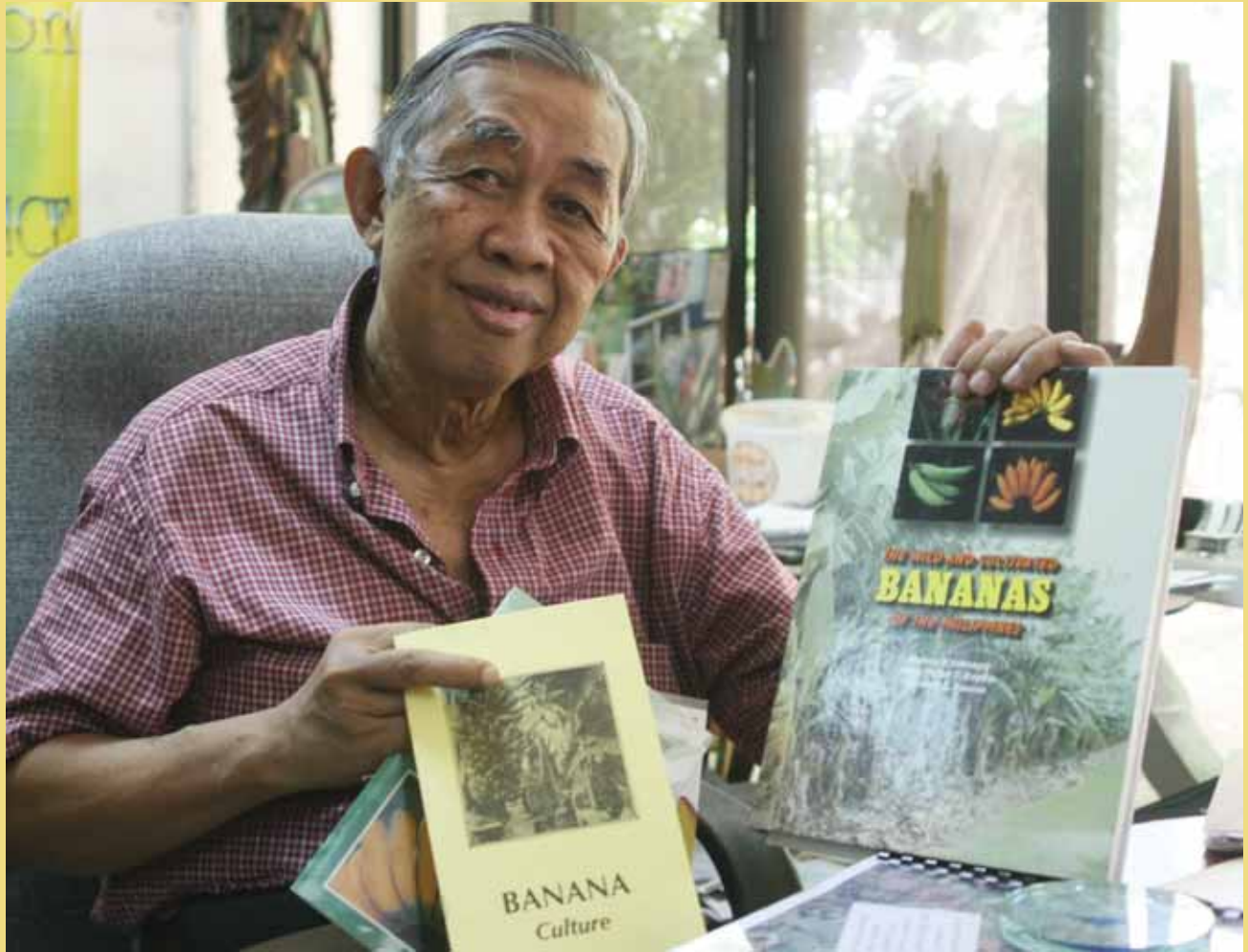
Just like the coconut, nothing is wasted in saba, says Labadan. The leaves can be used as packing materials for the fruits and vegetables in the market. The banana fiber can also be manufactured into rope, sack and mat. Sheets of paper and paper boards are also made from the banana peel.

The health agenda

In the past, saba plants are being taken for granted although they are seen in a lot of backyards. But with the current demand for saba, he says that it would be best for the city folk to start looking for vacant areas in the subdivisions to develop a farm.

For instance, he says that the source of fruit in commercial quantity has always been Mindanao, but even in the South, there is a big demand for saba as an alternative to rice.

It is considered an important food to improve the health of malnourished children since it contains two grams of protein and four grams of fiber. For its carbohydrate counters, there are 36



“So maybe it’s time to change that well-known phrase so that we say, ‘A banana a day keeps the doctor away!’” Labadan says.

grams of carbs in a large banana. Doctors have also been recommending the banana for their patients because of their impressive potassium content.

Vitamins and minerals are abundant in the banana, offering 123 I.U. of vitamin A and a full range of Vitamins B and C.

It can also help people who are trying to give up smoking. With its B6 and B12 as well as the potassium and magnesium, it can help the body recover from the effects of nicotine withdrawal.

Lately, it has become a fad for the “yuppies” to eat bananas because

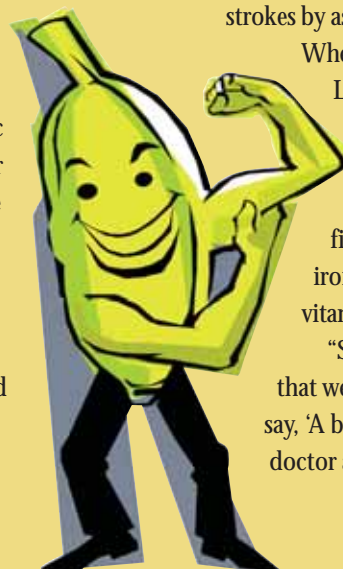
potassium, its vital mineral, can help normalize heartbeat, send oxygen to the brain and regulate the body’s water balance. When we are stressed, our metabolic rates rise, reducing our potassium level. These can be rebalanced with the help of a high potassium banana snack.

The New England Journal of Medicine also reported that by

eating bananas as part of a regular diet could help cut the risk of death by strokes by as much as 40 percent.

When compared to apple, Labadan says that it has four times the protein, twice the carbohydrate, three times the phosphorus, five times the Vitamin A and iron, and twice the other vitamins and minerals.

“So maybe it’s time to change that well-known phrase so that we say, ‘A banana a day keeps the doctor away!’” Labadan says.



Milk in abundance, courtesy of the hardy carabao

FROM the moment we were born, milk has been a part of our lives. It was our first food, when we were, luckily for our mothers, still toothless.

As time went by, our mothers stopped lactating, again, luckily for them because we have grown teeth.

But our dependence on milk for nutrients has not stopped, and we started to crave for other milk-based products, that are often sweet, and cause loss of teeth.

Luckily for us, there are cows, and carabaos.

The Filipinos romance with the mud-rolling beast of burden has spanned generations. Carabaos have been there, inseparable with the farmer, from the moment the field is plowed, to the moment the harvest is milled, up to hauling the milled rice to the market.

Besides being a steady helper in the fields, carabaos are butchered for their meat and their milk has been part of the Filipino diet for so long.

At the Philippine Carabao Center (PCC), opportunities abound for farmers to create small milk-based carabao industries through in-vitro embryo transfer that gives carabaos superior genes so that they can produce 10-15 liters of milk a day.

The center has also recently been named as the lead developing agency in developing biotechnologies aimed to speed up the improvement of cattle and other compound-stomached (with four compartments) mammals, called ruminants.

According to the secretary, “the role of ruminants as a source of food in the form of meat and milk as well as livelihood among small-hold farming families is becoming more pronounced in the light of the increasing demand for food of animal origin. There is a recognized need to enhance the DA’s genetic improvement programs in farm animals,



Alicia Ilaga

particularly among ruminants in support of the national program of improving livestock production and food security.”

He directed the PCC to coordinate with fellow livestock agencies like the Bureau of Animal Industry and National Dairy Authority in the implementation of genetic improvement initiatives.

Genetic improvement programs in ruminants are limited by the nature of biological parameters, such as long generation interval and limited number of offspring per birth. Reproductive biotechnologies like in vitro embryo production (IVEP) and embryo transfer, along with somatic cell nuclear transfer and gene-based technology like Marker

Assisted Selection are shown to hasten as well as increase accuracy of selection and propagation of superior genetics.

Sad to say milk does not stay fresh very long. That is why many have ventured in the use of carabao’s milk for the food business.

Dairy products, like mozzarella chesse, pastillas de leche, yogurt, butter, cream and other sweets are also made there.

Pastillas de leche is a top seller. In fact, PCC has concocted varieties laced with langka, carrots, pandan and lemon grass.

The PCC already supplies a Makati-based Italian restaurant its mozzarella cheese needs and targets a bigger market the moment they produce more milk.

Milk and the ever-reliable carabao. They have fed and nourished us. Soon, they might give life not only to us, but also our economy, and rouse our country from its deep slumber.

Alicia Ilaga is the Director of the Department of Agriculture – Biotechnology Program Office (DA-BPO) and the Vice President of the Biotechnology Information Organization Network (BIONet).

At the Philippine Carabao Center, opportunities abound for farmers to create small milk-based carabao industries through in-vitro embryo transfer that gives carabaos superior genes so that they can produce 10-15 liters of milk a day.

Where is RP's herbal industry?

By LIA M. MAÑALAC

EVERY barangay in the Philippines has at least three to four *albularyos*— traditional doctors who use traditional methods and practices of medicine and healing.

Often, *albularyos* are also referred to as *spiritistas*, since they often credit their healing abilities to a superior God or to the spirits of the world.

Traditional Medicine and RP

Herbal plants or medicinal plants were used to heal common ailments like fever. In the 18th century, the Augustinian priest Father Blanco wrote a book and compiled all medicinal plants traditionally being used in the Philippines. Dr. Pardo de Tavera also wrote an expanded book on the same pharmacological value of indigenous herbs.

For centuries, traditional medicine and indigenous forms of healing were the norm in the country, and almost all cultural groups had their own set of healers and medical lore. The advancement of the traditional therapy, even as it is universally accepted, was stunted by the introduction by the Americans of Western medicine and the public health system.



NEIL DOLORICON

Suddenly, traditional medicine and healing were treated with contempt and healers were branded as quacks, or even witches or wizards.

The negative tag on *albularyos* eventually discouraged their descendants from practicing traditional medicine and pharmacology.

Little by little, they disappeared. As the children of the traditional healers were educated, they were exposed to the benefits of Western medicine, and loathed to be labeled as *albularyos*.

Baby Boomers and the Herbal Industry

Yet, the *albularyos* will not be denied their place in history.

The Baby Boomers, the generation that appeared in the aftermath of World War II, the gang of fellows that grew with the beatniks and the anti-Vietnam war flower people of San Francisco, were the ones who took a second look at traditional methods of healing.

Interest in herbals became more pronounced as more and more ailments defied treatment by Western medicine.

Now in the mid-life, the Baby Boomers continue to seek natural ingredients for pharmaceutical preparations.

In the 1980s, herbals started to penetrate the cosmetic industry. Products like gugo and Lauat shampoo to address falling hair problems were introduced. Whitening soaps like Likas Papaya also made it big.

The 1990s saw the rise of food supplements— *Charantia, pito-pito*— and alternative medicines like *lagundi, sambong* and banaba tea.

In 1997, the Traditional Alternative Medicine Act (TAMA) was passed to encourage, support and protect alternative medicinal practices.

The Philippine Institute of Tradi-

tional and Alternative Health Care (PITAHC) was also established and four herbal processing plants, including those of Splash, were created and BIO-Search, an exhibit for herbal products, was launched.

Hope for Herbals in the Philippines

It was in 2001 that the Chamber of Herbal Industries of the Philippines (CHIPI) was established.

At present, more than 100 herbal companies have ventured into herbals for cosmetics, as food supplements, alternative medicine and others. But while it may seem to be an increasingly successful field, CHIPI President Dr. Rainier Villanueva says, the country's herbal industry is still at its infancy.

The 1990s saw the rise of food supplements— *Charantia, pito-pito*— and alternative medicines like *lagundi, sambong* and banaba tea.

“One indicator of this is BFAD (Bureau of Food and Drugs). There is no specific guideline on regulating herbal products,” he says.

Villanueva adds that only a number of the more than 100 herbal companies are recognized, accredited and have passed the standards of the BFAD. Even those that have passed tests and approved for consumer are sometimes questioned anew by the same regulating agency itself.

One example, Villanueva cites, is the latest full-page advertisement released by the BFAD against food supplement use by consumers.

He found it a bit absurd that the

regulating agency that approved the food supplements is the same agency to question its own approval.

“In the first place, all products especially products ng CHIPI, passed through their agency for their approval. And then *sasabihin nila ganyan. Kaninong kamay ang nagbayad!*” he asks.

But there is hope, Villanueva says. Should scientists start becoming entrepreneurs?

Do Business with Herbals

“*Mas mapapaniwala ang publiko sa produkto na herbal kung maraming scientists na magne-negosyante din kasi they can carry their credentials,*” he says.

CHIPI admits the pharmaceutical industry in general is downplaying the potential of the herbal industry because it lacks proof.

The government rarely funds clinical studies. And if they are funded, scientists behind great discoveries and breakthroughs rarely make business out of them.

“*Kaya lang ang nakakalungkot lang, itong mga scientists natin, ginagamit nila (ang mga research nila) para humaba ang kanilang curriculum vitae,* but not really to generate employment.”

It is time, Villanueva says, that scientists get out of their shell, explore possibilities and make money out of their discoveries.

Villanueva proposes that entrepreneurship be included in Ph. D. courses. Even science courses that are likely to offer research positions for students should start teaching entrepreneurship, he says.

“Scientists should be entrepreneurs themselves. For all you know *sa mga SCU (State Colleges and Universities), there are a lot of good minds there, breakthrough products kaya lang hindi nako-commercialize.*”

Abaca industry

fights deadly viruses, starts bid to become RP's big income earner

By ANN BURGOS

ABACA, a family of Musaceae from which Musa textile is derived, is a plant indigenous to the Philippines.

Although it is also known variously as Manila

hemp, Cebu hemp or sometimes Davao hemp, abaca is not related to true Hemp, one of the fastest growing biomasses known for the “Green Future.”

Abaca fiber is second in importance among the leaf fiber group. Unlike other fibers, abaca fiber is obtained from the plant leaf. The stalk is the source of the abaca fiber, retrieved through the extraction of tuxies from the outermost portion of the leafsheath. Fibers are then extracted through hand stripping or through a stripping machine.

The dried outer leafsheath, also known in the industry as Abaca-bacbac is used in making handicraft items. It is skinny on the upper side of the leaf, but soft and fleshy on the other side. It is not receptive to penetration of colorants and has a low tensile strength. Bacbac is sometimes called Havana hemp or Havana skin.

The third and fourth layers of the leafsheath, or lupis as others call it, are brown in color and skinny on the other part of the stripped fiber. It is bigger compared to fine

abaca. Like the bacbac, this part of the plant is also used for handicraft items. It may also be used in making fashion accessories, furniture, packaging materials, tabletop accessories and other decors.

Abaca is believed to have evolved in the Bicol Region. Long before the Spaniards came to the Philippines in 1521, our ancestors were already processing abaca into breathable fabrics and durable sandals.

In 1821, a US Navy lieutenant brought abaca fiber samples to the US. A cargo of abaca was sent to Salem, Massachusetts under the label “Manila.”

The Americans later became the largest abaca importers as the port of Manila was opened for international trade in 1834.

The versatility of abaca fiber has been proven by its many applications, from ropes, bags, hats, footwear, decorative ac-

cessories, and other items and then to furniture, fixtures, paper and textiles. A famous abaca product is *sinamay*, or woven abaca fibers that come in different colors and used to make clothes apart from their being transformed into packaging materials and decorations.

Abaca fiber is also used for making pulp, which is the raw material for the production of paper bills. The P20 and P500 bills contain almost 20 percent abaca fiber. Tea bags, coffee filters, meat casing, coating for pills, cable insulation papers, insulation for computer chips, etc., may also be derived from the abaca fiber.

The advancement in technology has made it possible for abaca fiber to be used for the interiors of automobiles or as substitute for fiberglass. In the US, abaca enzymes are being used for cosmetics and skin care products.



Even the stripping waste of abaca has many uses.

It may be used as a growing medium for mushroom culture, raw material for handmade papers, compost, alcohol production, while the residue from alcohol extraction may be processed into waxes or used in making organic fertilizers.

Abaca fiber production is one of the Philippines' greatest contributions in the world trade.

About 85 percent of the abaca fiber supply in the whole world comes from the Philippines.

Abaca grows almost anywhere in the Philippines, from Sorsogon, Leyte, Southern Leyte, Catanduanes, Davao Oriental, Northern Samar, Davao del Sur, Sulu, and Surigao del Sur. Abaca fibers coming from Leyte and Southern Leyte are known to be the most durable.

The abaca industry plays a vital role for the Philippine economy since it earns \$76 million annually and employs 1.5 million people.

However, the entire industry is under threat by pernicious pests like bracht mosaic, mosaic and the bunchy-top.

To maintain the country's global edge in the market, the Department of Agriculture-Biotechnology Program Office (DA-BPO), in collaboration with the Fiber Industry Development Authority (FIDA), Institute of Plant Breeding (IPB) of UP Los Baños and some of the country's top scientists are conducting studies on the production of virus-resistant abaca plants to increase fiber production and thus improve the earnings of the industry.

Dr. Anton Lalusin of the Institute of Plant Breeding (IPB), a horticulture plant breeding graduate of the University of the Philippines-Los Baños (UPLB) supervises the institute's study on the production of bunchy-top virus-resistant abaca.

Lalusin started doing sweet potato research for IPB after he graduated in 1994

and headed to Japan for his masteral and doctoral studies on bio-research engineering, specializing in molecular biology.

He began to work on abaca when he came back from Japan and noted the focus was on the bunchy-top virus, the most deadly among the three viruses.

An abaca plant infected with the bunchy-top virus stops growing and thus, no fiber could be derived from it.

The first batch of their experiment was conducted through conventional breeding, assisted by molecular markers of the plant. The process of determining molecular markers is similar to that of fingerprint matching. It is used to identify a particular genetic sequence.

Lalusin's team used "Pakol," a native variety of banana as a parent of the abaca, since it has virus-free characteristics.

The group was successful in producing a bunchy-top virus-free abaca strain. However, they needed to conduct more studies since the one they produced was poor in fiber quality. To secure the good fiber quality of the abaca, they rebred the abaca plant they produced with another abaca plant. They now have abaca plants that contain almost 87.5 percent of abaca gene. The group expects to harvest the plants this month.

To further strengthen the efforts of the DA-BPO to maintain the Philippines triumph in supplying abaca fiber across the globe, other projects like the production of the first-ever abaca manuscript is being done to provide more information about the importance of abaca.

Another group of researchers in IPB supervised by Dr. Dizon is doing a research on the production of mosaic and bracht-mosaic virus-resistant plants through irradiation.

DA-BPO aims to revitalize the abaca industry and transform it into a leading product that is truly indigenous to the country.

Writing about the abaca

ABACA is currently being genetically improved using modern biotechnology methods by scientists of the two campuses of the University of the Philippines, Los Baños and Diliman.

The object for these efforts is to produce abaca resistant to the viruses that have decreased its productivity – the abaca bunchy top virus and the abaca mosaic virus. Another damaging virus lately identified is the bract mosaic virus.

The reduction in yields from these viruses caused the abaca farmers of the Bicol region income losses of about P18 Million in 1991. In addition to loss in yields, some fields are no longer productive because the more damaging virus, the bunchy top virus prevents abaca from growing into large productive plants and causes them to die eventually.

These diseases have been with the industry for the past century and devastation has continued so much so that many areas previously planted with abaca no longer exists. For example, I was surprised to read that abaca used to be grown productively in Laguna, Cavite and Batangas. Today, abaca is no longer produced in these provinces. Abaca mosaic wiped out the plantations in these areas.

Thus, it is no wonder that our scientists have taken on the



problem and try their hands at developing a solution such as a genetically modified (GM) virus resistant abaca. Developing this GM abaca will take significant amount of resources such as scientific talent and skills, money and time especially since genetically engineered crops are

regulated as per DA AO 8.

This regulation requires that we must be familiar with the reproductive biology and ecology of the species in order to identify possible risks posed by a GM abaca.

For example, based on what we know about the biology of the abaca, is it possible that the introduction of a new gene will cause the GM abaca to reproduce like a weed and cause problems like a weed?

On the other hand, are there animals that depend on the abaca for food so that if we introduce a gene in the abaca that produces a foreign protein, will this animal be adversely affected?

Or, is the abaca a traditional food among certain groups of Filipinos?

Much of what is written about the biology of the abaca is found in old scientific journals located in different libraries. Thus, to assist regulators, this writer thought of collating these pieces of information in a coherent manner that would make

the abaca familiar and thus, allow them to identify possible food/feed safety and environmental safety issues.

The idea of the book – The abaca - was born. Writing about abaca is hard but enjoyable work. Going through dusty shelves and disintegrating pages of old manuscripts have yielded many interesting facts about abaca. One fact that I gathered which gave me pride to write about it is that abaca was domesticated by early Filipinos. Abaca is the Filipino's contribution to world agriculture.

Another tidbit of interesting information is that the reason that the Philippines lost its monopoly over abaca is because the American government whose Navy became dependent on abaca fiber for its marine cordage before World War II tried to break that monopoly by planting Philippine abaca in other tropical countries.

Abaca was tried in more than 20 countries but only one country today produce abaca fiber for world commerce. Ecuador produces about 15 percent of the abaca in the world market and the rest by the Philippines.

Another information that I found interesting is the difficulty of making crosses and differences in chromosome numbers among so-called varieties of abaca. This indicates that these “abaca varieties” may not be varieties of one species but could be different species or hybrids between species.

I hope one or two of our younger scientists will find this matter challenging enough to devote time for study and elucidation.

Another interesting information that I gathered is that bats may also help in the pollination of abaca by sipping the nectar

of its flowers.

The abaca flower like the banana flower produces a prodigious amount of nectar collected at the cup-like base formed by its petal and sepal– a fact that took me back in my childhood days when as a child I used to gather fallen banana male flowers early in the morning and sip at their nectar.

But most of all, I gathered that the commercial uses of abaca has continued to expand. From cordage and textile used by early Filipinos, many items made wholly or in part of abaca fiber are commonly used everyday such as paper currency (the P500 bill as well the Japanese yen have abaca fiber), tea bags, sausage casings, disposable diapers, napkins and many more.

What blows my mind is to learn that abaca fibers have been used in making the luxury car – Mercedes Benz. The standard underbody cover for the spare-wheel compartment of the three-door version of the Mercedes Benz A-Class coupe is made of a composite consisting of abaca fiber in a polypropylene matrix that makes the material biodegradable. Abaca has made the Mercedes Benz environment-friendly.

After the World War II, diseases and the advent of nylon made the abaca less attractive as an industrial raw material. But imagination and environmental concerns has brought the abaca back into commerce.

Today, abaca remains a significant Philippine crop and deserves the efforts of our scientists in ensuring that the abaca will overcome the diseases that threaten its extinction.

Saturnina Halos is the Chairperson of the Biotechnology Advisory Team, Department of Agriculture.



Biotechnology: A commercialized industry?

By **ANGELICA G. CARBALLO**

A SAYING goes that necessity is the mother of invention.

In the Philippine setting, our growing population, now nearing 89 million, spells necessity more than anything.

Biotechnology is seen by many as an answer to the growing needs of the planet. In our country, the Department of Agriculture (DA) is very active in research and development in biotechnology to generate products that will benefit the populace.

An example of this is the growing number of hybrid rice strains that aim to fill the widening gap of supply and demand in the market. But questions about commercializing biotechnologically enhanced products and bringing them to the market are being raised. The pros and cons are being weighed more carefully than ever and the benefits of biotechnology to the common folk are now being tested.

In a collaborative research published by the Philippine Rice Research Institute (PhilRice) and Sikap/Strife Foundation

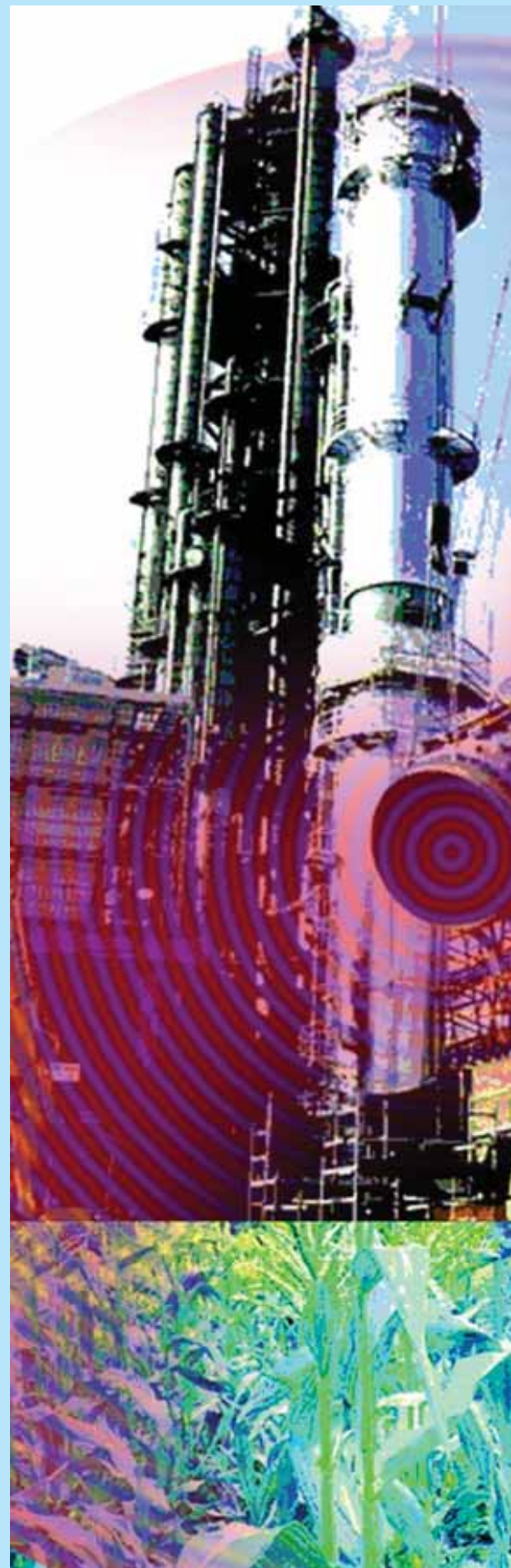
under the tutelage of PhilRice deputy executive director Ronilo A. Beronio, a study was done to examine whether the Philippines is ready to face the commercialization of biotech products, or not. The respondents were animal and plant biotechnology researchers and scientists from the DA.

They said "aye"

Should it be commercialized?

Majority of biotech researchers and scientists in question are positive that biotech research and development (R&D) results should be commercially sold. They think this would solve the country's problem of food insufficiency, unemployment and poverty, and would provide faster dissemination of products and technologies to the public.

However, questions of safety, long-term effects, ethical and social impacts, productivity and end-user benefits are the common issues raised on the biotech industry. While conservatives still spew venom against biotech products, new findings show that consuming genetically modified organisms (GMOs) is as safe as feasting on non-GMOs.





NEIL DOLORICON

The advanced knowledge on biotech, and awareness of intellectual property rights (IPRs), by practitioners and researchers is a key reason for their consent.

And they said “nay”

On the other hand, a small percentage of the group said no.

The incessant fear of biotech products' impact on health and the environment was the main culprits for this. Also, the respondents were mindful of the IPR of the product, their readiness to face the consequences of commercialization, and if there is sufficient protection to the developers' and investors' exclusive rights.

Fear Factor

Commercialization of scientific research results is the new trend in countries that embrace innovation in crafting economic policies. The motor of development in these countries is the private sector, which operates on the cardinal principle of economies of scale and are most concerned in reducing costs to make the products available to even larger markets.

The factors that affect the commercialization of biotech products, as perceived by the respondents, are the acquired competence through training, the ownership of intellectual property output, adequate facilities and laboratories, market acceptability and the presence of market structures to enhance and complement research and development (R&D).

These factors make it important for the scientists to have at least an idea on how the commercialization process goes. The importance of protecting developers' exclusive rights to the product is a key component. The developers must, above all, be insured that proper credit

and recognition be given to them after their products are deployed for popular consumption.

Proud Products

Golden Rice, a food fortified with vitamin A, is an example of a product that was developed through biotechnology. Plans for future research are in the works for potato that will absorb less oil when fried, increasing protein content of maize and soybean, fresher favor for tomato, and strawberry that will retain natural sweetness.

In addition, the provision of the Agriculture and Fisheries Modernization Act (AFMA) on the widespread use of fertilizers that will prevent pests and diseases can be realized through biotechnology.

These products are created and developed with public welfare in mind. As of the moment, the administration and commercial distribution of Golden Rice is pending approval. It will undergo a field test in November to see how well it can adapt to Philippine environment. Golden Rice screen planting is currently in the works.

According to an earlier study, research products will not create any considerable impact unless the product is transferred to the end users or commercialized. After all, the objective of biotechnology is to pump up the status of the country's agriculture and fishery sectors.

Knowledge is Power

Although the respondents' views are independent of their socio-demographic status, the perceptions are connected with their knowledge in biotechnology and IPR.

Those with higher awareness in biotechnology and IPR are more likely to give a positive response to biotech

commercialization. On the other hand, respondents with lower knowledge on the subject tend to look at commercialization on a negative view.

This may also be applied to the greater public. Knowledge is what stops us from fearing the unknown. Fears on the repercussions of promoting and using biotechnological products, despite the repeated results stating that biotechnologically enhanced products are safe for human consumption, are proof that cynicism against GM food exists.

Key to Correction

Therefore, if the end product of biotechnology ought to be put under public scrutiny, major projects on educating the public must be launched.

Also, stricter implementation of IPR policies should be undertaken. Based on earlier findings on the perception on commercialization of biotech products, agricultural research managers tend to give a positive outlook towards stricter IPR protection and commercialization of some parts of their research to recoup their expenses.

The end-product of technology is aimed at alleviating the lives of those mired in poverty, malnutrition, and lack of proper care. The modernization of the agriculture and fishery sectors must hew closely to the need to serve the growing population and all sectors, from the producer to the end-user.

Therefore, there is thus a need for a widespread education about GM products – how the technology works, what it can do, and what the benefits and risks are.

Only then could we let go of the blinding fear that prevents us from realizing the full potential of the biotech industry.

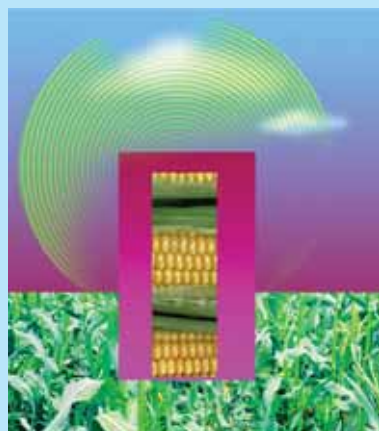
Exclusively public: IPR in review

INTELLECTUAL property rights (IPR) are rights conferred by law to balance the interest of the inventor or innovator to the needs of the society.

It is aimed to encourage invention, innovation and dissemination of technological advancements and provide exclusive rights over the creations of the mind, be it artistic or commercial. The holder has the right over reproduction and adaptation of such works over a certain period of time.

All forms of IPR protection provide holders the right to defend their rights to the property they created, prevent others from taking advantage of their ingenuity, encourage continuing innovativeness and creativity, and assure a flow of useful, informative, and intellectual works (Smiler and Ersbich 2004).

In relation to biotechnology, the Department of Agriculture has its own policy on IPR. It was issued to encourage the development of more technological innovations, creations and inventions.



NEIL DOLORICON

In a collaborative research published by the Philippine Rice Research Institute (PhilRice) and Sikap/Strife Foundation, it was found out that IPR plays a major role in the commercial advancement of biotechnology in the Philippines.

Although majority of the respondents do not have actual experience or training in making IPR applications, they are aware of its existence. They also agree that it plays a relevant role to the formulation, development and implementation of DA programs. They think it gives them the power to increase their patenting and licensing activities, better handling of propriety issues, and safe commercialization of biotech products.

The DA's effort to map an IP Policy is commendable. According to the study, it might still be too soon to measure the impact of DA IPR policy on the technology management programs of the institutions concerned, but the results show that the scientists and researchers are positive on the policy. This, therefore, should guide DA in implementing the guidelines of the policy and pursuing other IP management initiatives.

The Intellectual Property Code of the Philippines states: "The State shall promote the diffusion of knowledge and information for the promotion of national development and progress and the common good." The protection of the scientist's exclusive rights to his own brainchild is vital to the realization of biotech commercialization in order to secure and protect the future of biotechnology in the country, and the future of the country as well. (*Angelica G. Carballo*)



The country's second rice granary is eyeing the potentials of biotechnology to help alleviate poverty and increase farmers' income.

Occidental Mindoro opens doors to biotechnology economic opportunities

SAN JOSE, Occidental Mindoro— Occidental Mindoro opened its doors to biotechnology economic opportunities after a two-day seminar workshop conducted by the Department of Agriculture-Biotechnology Program Office (DA-BPO) last June 2-3.

San Jose Mayor Romulo Festin who graced the first day of the seminar-workshop held at the Sikatuna Village Beach Resort said, that biotechnology offers hope for farmers. "*Lahat ng technology na makakatulong sa amin, okay sa amin. Sana maging eye opener ito, para di tayo mahuli sa modern technology sa pagsasaka,*" Festin said.

The country's second rice granary is eyeing the potentials of biotechnology to help alleviate poverty and increase farmers'

income.

Rice and corn are the two major crops produced in Occidental Mindoro. In the municipality of San Jose, 70 percent of municipal government projects are devoted for agriculture. Councilor Emil Villanada, Chairman of San Jose's Committee on Agriculture and Fisheries said, farmers have been planting hybrid rice varieties and even *Bacillus thuringiensis (Bt)* corn.

Festin likewise added, farmers themselves have affirmed how these varieties have improved their production.

"*Itong Bt corn, binibili nila kahit na medyo may mga ano dito, mga nagdududa o tamang duda or may parang medyo against dito,*" Festin said.

Vic Alpuerto of Monsanto, a multinational seed technol-



The participants and organizers of the seminar-workshop on economic opportunities in biotechnology held in Occidental Mindoro

ogy company gave farmers a lecture on *Bt* corn and encouraged farmers to plant *Bt* corn because it is high yielding. Alpuerto also eased any apprehension on the use of *Bt* corn because of the current high price of the seeds in the market.

Councilor Emil Villanada who chairs San Jose Municipal Council Committee on Agriculture and Fisheries has high hopes for the future of biotechnology in their town.

“Especially *itong sa malunggay na ito, ako’y humahanga at marami palanguses ito at hindi natin alam. Personally akala ko malunggay lang yung nakatanim na yan. Pero yun palang kahalagahan nito sa paggamit sa katawan ng tao e talagang andito,*” Villanada said.

The DA-BPO also discussed other potential crops for propagation and commercial production in the province.

The Bureau of Plant Industry (BPI) gave a lecture on the

benefits of planting malunggay. BPI also gave a technology demonstration on how to process malunggay into simple products such as malunggay tea, polvoron and cupcake.

Rizal Mayor Sonia Pablo immediately called for a malunggay search in her town to encourage farmers who have already been planting malunggay to sell their seeds to Secura.

“*Sisimulan na namin ‘yung malunggay search. Ang ating mga staff sa Agriculture Office paghahanapin ko na ng malunggay seeds para ito ay mapa-propagate na natin, ma-germinate na natin. At idi-distribute namin sa mga farmers na interesado. Palagay ko yung mga nag-attend baka ‘di na makatulong yun e sa paghahanap ng malunggay,*” Pablo said.

Secura President Danny Manayaga urged Occidental Mindoro farmers to plant malunggay.

Secura is an all-Filipino biotechnology company that is



manufacturing malunggay seeds for oil. Malunggay oil or more commonly known as Moringa oil is a viable alternative biodiesel. Secura will export the oil to North American Biofuels Incorporated in the US.

A Biotechnology Information and Resource Center will be set up in San Jose, Occidental Mindoro this August to provide information on biotechnology to farmers here.

Mayor Festin welcomed this. *“Maraming mapapakinabangan magsasaka namin, mga kababayan namin dito. Puro kami magsasaka, ang ikinabubuhay namin dito pati mga negosyante, pagsasaka. Dahil pag walang ani, walang kikitain mga hardware, opisina. So ‘pag meron kaming link, yung ilalgay natin na BIONet center, ‘pag meron nyan biro mo hanggang Mindanao maa-access natin pati yang Abra na ‘yan.”* (Lia M. Mañalac)



Biotech helps enhance business opportunities in CARAGA

BUTUAN City is undoubtedly one urban center that has a long cultural history and its role as a center of trade had been proven by archaeological evidence.

As early as the 10th century, inhabitants of Butuan had strong trading relations with southern Vietnam, then known as the Kingdom of Champa, and the Srivijaya Empire centered in Java. Butuan became a center of commerce in the archipelago in the 11th century.

The discovery of nine *balangays*, or boats, and other archeological materials in the city and its environs, particularly in Ambangan, Libertad, near the old El Rio de Butuan and Masao River, confirmed that such trade relations existed and were undeniably strong.

The Department of Agriculture-Biotechnology Program Office (DA-BPO), through the Biotechnology Information and Organization Network (BIONet) aims to revive Butuan's lively commercial ties with other areas through BioCommerce.

In collaboration with the Northern Mindanao State Institute of Science and Technology (NORMISIST), BIONet established the 2nd BIONet-BIOCommerce center in the country at the heart of the CARAGA Region. The BIONet-BioCommerce center is located at the vicinity of the NORMISIST in Ampayon, Butuan City.

BIONet aims to strengthen the abaca fiber industry in the province by working closely with NORMISIST.

NORMISIST already has an existing research on the production of the virus-resistant abaca plants.

Dr. Rowena Varela, who supervises the NORMISIST laboratory proudly said they came up with virus-free plants by meticulously choosing the mother plants that show high virus resistance and breeding them through tissue culture.

The tissue culture laboratory was established in the 1990s and focused only on the elimination of the bugtok virus on Cardaba banana plants. Banana chips production is a key industry in Butuan City.

In the late 1990s, abaca tissue culture started in the province. The regional development council based in Butuan focused more on the Bracht mosaic and the Bunchy-top virus, which is commonly known to the industry as the most deleterious pest. The Department of Science and Technology (DOST) allotted

P700,000 for the project when then Rep. Boy Banaag supported the project and plunked in P1.4 million for it out of his pork barrel.

Other government agencies like the Commission on Higher Education (CHED), Fiber Industry Development Authority (FIDA), NEDA and Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) also pitched in by providing the technology for hardening or greenhouse cultivation.

The tissue culture laboratory was designed to provide virus-resistant abaca plants to the entire Mindanao island, except for the Autonomous Region of Muslim Mindanao (ARMM).

BIONet believes in the wonders of technology and stresses that if something really works, then people will buy it.

In establishing the organization in Butuan, the organizers got the utmost support from the local government and NORMISIST.

Farmers belonging to the CARAGA High Value Vegetables Cluster also became attracted to BIONet since they knew it would offer them better income opportunities.

Biotechnology actually opened new economic opportunities for millions of farmers and potential entrepreneurs.

Through the BIONet-BIOCommerce center, farmers and entrepreneurs may be able to learn more about the region's primary crops like the banana, corn, papaya, abaca, and malunggay, dubbed as the "miracle tree."

The presence of the BIONet-BIOCommerce Center in Butuan will hopefully help the NORMISIST strengthen the abaca growing communities in the region.

The abaca industry in the CARAGA region is crucial since it has become the second biggest source of abaca in the country after invading pests devastated plantations in Albay and Region 8. As a result of this disaster, the production of abaca fiber was greatly diminished.

The very essence of the establishment of the BIONet-BIOCommerce center in Butuan is to boost the income of farmers and link them to private corporations, local or foreign, which may need their abaca fiber. *(Ann Burgos)*



Commercializing malunggay in Tarlac

BARANGAY PARAISO, Tarlac City— Established in August 2007, the Malunggay BIO-Commerce Center in Tarlac was a project of the Department of Agriculture- Biotechnology Program Office (DA-BPO), Bureau of Plant Industry (BPI), DA-Regional Field Unit 3 and the National Agri-Business Corporation (NABCOR). The Center was created to serve as a research and development hub for the commercial production of malunggay, now a sought-after crop because of its nutrients.

The Malunggay BIOCommerce Center in Tarlac is a five-hectare farm inside the compound of Tarlac's DA-Research Center. Strategically located along the highway, interested farmers and agri-businessmen are given easy access to information on the guidelines for planting malunggay.

DA-Regional Field Unit 3 Agricultural Center Chief 3 Dr. Irene Adion is the farm supervisor at the center.

Everyday, she says, many motorists and farmers visit the center to ask about malunggay.

"Ang mga tanong nila, ano ba ito, bakit ganito karami, paano ang ginawa ninyo, saan ba ang market niyan at magkano ba ang kikitain namin diyan."

By next year, Adion hopes they will be successful in the commercialization of malunggay. The center is now focusing its efforts on commercially producing seeds for commercial seed growers. One hectare of the malunggay farm is now devoted for commercial seed production.

"Maygo-signal na kami sa DA-Biotech na pwede na mag-start 'yung seedling production, para tayo na mag-supply ng seedlings sa commercial growers," Adion says.

Right now she believes, there is a huge market for malunggay seedlings because of its potential for livestock feeds and human consumption—providing a steady answer to the increasing problem of world

hunger. Malunggay seeds are also a viable commercial product after it has been recognized as one of the best sources for alternative biodiesel that is now in demand in the US.

It took the center at least a few months before it succeeded in growing malunggay. The center initially failed to grow malunggay seedlings.

"Akala natin, ganun lang ka-simple. Pero kapag commercial, iba pala. Marami kasing problem 'yung direct seeding lalo na kung ganitong wet season."

So they directly planted the seedlings in a pot and created a nursery. That was the time they succeeded in growing malunggay. *"Mas practical na mag-nursery ka kahit na seedling man 'yan o cutting para mas ma-manage mo ng husto 'yung maraming planting materials,"* she says.

This strategy says Adion is one of the technologies they intend to share with interested farmers with their upcoming techno-demonstrations on the field. The Center also hopes to establish a processing facility within the compound should commercial malunggay production does well, to provide farmers the needed technology to personally process their malunggay for other commercial products.

At present, BPI has developed malunggay food products such as the malunggay tea, polvoron, galletas, ice cream and siomai.

"Dapat whole package, kung may production tayo may processing, product development at marketing para mag-work talaga 'yung center," Adion says.

The Malunggay BIOCommerce Center in Tarlac is just a first for the efforts of malunggay advocates to commercialize malunggay and further expand its marketing potentials. Government agencies hope to establish more centers of its kind to help farmers increase income and also give them the right technology for planting and processing malunggay.

In Tarlac, Adion sees the center as the start of a better life for farmers here, "50 percent ng farmers dito rain-fed areas mga farms nila. Marami rin mountainous areas dito na very marginalized at hindi na-optimize ang gamit. Nakikita natin kung magagamit 'yan for malunggay, magiging productive lahat sila." (*Lia M. Mañalac*)

Malunggay recipes please, ma'am!

THE Department of Education (DepEd) has joined the bandwagon in the comeback of the power gulay, malunggay.

This school year, malunggay recipe books will be given out to teachers, school canteen managers and members of the Parent and Teachers Classroom Association (PTCA), following DepEd Memorandum Order 234 signed by Education Secretary Jesli Lapus.

The same memo also instructs DepEd bureau directors, regional directors, school division and city superintendents to plant malunggay trees in school campuses and communities, through integration in Science classes and community outreach projects.

DepEd's Doctora Malunggay—

DepEd Health and Nutrition Center Director Thelma Santos was the staunch advocate for the integration of malunggay in the in-school feeding program of the government. She believes malunggay is the future of sustaining the program since it is cheap to plant malunggay.

“They don't need to look for the supplier of malunggay because they can already have their own malunggay powder, and their own malunggay. They start planting the trees, self-sufficient na tayo. Just imagine, *ang galing-galing.*” Santos says.

Every year, at least 2.5 million Filipino school children come to school undernourished. The DepEd aims to lower this number by at least five to seven percent with their in-school

feeding programs. Santos admits, sustaining the project will cost the government so much. But with the breakthrough of the malunggay recipes—there will not be any problem anymore.

“We have created awareness that the lowly malunggay could save us from malnutrition and even hunger. The malunggay recipe is a breakthrough,” she says.

Forty malunggay recipes ranging from snacks such as polvoron, fishballs, buchi-buchi and lumpia— to sumptuous dishes such as malunggay con caldo, mal-pinakbet and malulai or Malunggay Laing will be in the recipe book that will also teach teachers and parents how to prepare malunggay shakes and juices.

(Lia M. Mañalac)

DepEd Health and
Nutrition Center
Director Thelma Santos





Moringa Shanghai Rolls

- 12 ½ cups ground pork
- 2 ½ cups onion
- 2 ½ cups garlic
- 10 cups carrots (cubed)
- 2 ½ cups flour
- 10 pcs. egg
- 1 ¼ cups tomato sauce
- 5 cups malunggay leaves
- 10 tsp iodized salt
- 100 pcs. lumpia wrapper
- 7 ½ cups cooking oil
- kinchay

1. In a mixture bowl, place the ground pork, garlic, onion, carrots, flour, eggs, tomato sauce, kinchay and malunggay leaves.
2. Mix the ingredients. Put salt for seasoning.
3. Cut the lumpia wrappers into halves.
4. Put 20 grams of the mixture in every lumpia wrapper. Seal the edges by putting water.
5. Deep-fry the lumpia in cooking oil.
6. Serve with vinegar or catsup.

*This serving is good for 25 people and costs P586.40.

Malulai (Malunggay Laing)

- 10 cups malunggay leaves
- 2 ½ cups shrimp
- 2 ½ cups coconut milk 1st extract
- 5 cups coconut milk 2nd extract
- 5 Tbsp onion slice
- 5 Tbsp garlic
- 5 Tbsp bagoong alamang
- 30 pcs. Gabi leaves
- 5 Tbsp ginger

- 10 pcs. Spring onion
- 5 pcs. Tomato slice
- 5 pcs. Sili matulis
- 2 ½ cups grated young coconut
- 2 ½ cups carrots chopped

1. Chop shrimp and malunggay. Add chopped young coconut, onion, garlic and bagoong alamang.
2. Mix well.
3. Divide into 6 parts about 1/4 c and wrap with gabi leaves. Fasten with toothpick.
4. In a carajay arrange properly with crush ginger, spring onion and bagoong. Top with coconut milk.
5. Cover and boil for 30 minutes over low fire.
6. Shake the carajay from time to time to avoid scorching.
7. When almost done, add pure coconut milk (1st extract) together with siling matulis.
8. Cook until the coconut milk curdles or thicken.
9. Season to taste, remove from fire. Serve.

Malunggay Shake

- 10 cups powdered malunggay leaves
- 10 cups evaporated milk
- 10 cups Indian green mango
- 10 tbsp calamansi juice
- 10 cups refined sugar
- crushed ice
- a pinch of salt (if desired)

1. Blanch the powdered malunggay leaves. Let it cool, then cut finely.
2. In a blender, place milk, mango, calamansi juice and sugar
3. Put crushed ice, salt (if desired), then mix well.



Guide to successful Moringa establishment (dry season)

By **MAC T. ILAGA**

MALUNGAY (Tag.) marunggay (Il.) or Kalamunge (Pamp.), scientifically called *Moringa oleifera*, once regarded as a lowly tree or herb deserves the prefix “wonder” due to the many products derived from this plant. These products include food supplements, cosmetics, medical preparations, drinks, animal feeds, oil and a host of other uses that may soon embrace global trade. Nutritionwise, we have coined the term “miracle tree” because it could be the very solution for malnutrition among Filipinos as it has done for Africans.

The tree is easy to grow, attaining tremendous height in a few months or even weeks if planted on good soil that is more or less loose and containing plenty of organic matter. A flag-pole is what country folks call it. If its trunk attains the girth of a human body and cut to a man's height, it will produce profuse shoots loaded with eighty or more pods to a single tree.

Planting malunggay from seeds

On a plantation scale it is more advisable to start the plant from seeds. Pods from fruitful trees must be picked when fully dried. The winged seeds from the pods are air-dried for a few days and sown without delay. The wings may be clipped with scissors and then “awakened” by soaking in water overnight. These are then washed and then spread on a shallow trench lined with cloth. On top of the seeds another piece of cloth must be laid

and the whole setup is moistened regularly until the seeds break open. Only the seeds that break open should be sown individually in plastic bags containing a mixture of vermicompost and partly decomposed rice hull in a fifty-fifty proportion. The size of the plastic bag is ideally four and one-half by eight and one-half inches (4 ½ x 3 ½) with two punched holes, one on each side of the bag and approximately two inches from the bottom of the bag. Germination may be insured by positioning the seed one-inch deep and the break-



Dried malunggay seeds ready for planting

open part of the seed always on top.

When sown during the dry season, daily watering with a sprinkler is suggested to accelerate growth of the seedlings which should be ready for transplanting when they attain a height of one and one-half foot tall and their stems are slightly less than the size of a lead pencil.

Transplanting distance

Holes for transplanting should be spaced in straight rows, and their distances should be determined depending on pur-

pose, whether they are solely for leaf production or for production of pods. For leaf production, as when the top growths are regularly cut like a hedge, leaves and tender stalk together, the holes should be spaced close to each other one to one-half feet apart in double rows, allowing a meter or so between double rows for convenient passage of clipper.

If the seedlings are grown for pod production, holes should be made one and a half meter between hills in the row in rows space two or more meters apart. This allows for the development of bigger trunks for more profuse production of pods.

The depth and diameter of holes is critical in convenient setting of and in providing an initial nutrition of the transplants consisting of a mixture of vermicompost and partly decomposed rice hull obtained from the poultry establishments that they use as litter or bedding for chicken droppings. Bigger diameter of holes allow for carefully setting the seedling at

the bottom of the hole with both hands without breaking the soil around the roots after removing the plastic wrap. Thereafter, complete the soil cover around the base of the transplants using ordinary soil excavated from the hole. Add two liters of water to the transplant and water the plants occasionally thereafter as the need arises.

(Mac T. Ilaga is a former University of the Philippines-Los Baños professor on agronomy, retired Fields Operations Manager, Hacienda Luisita and a full-time farmer.)



Makapuno

goes high-end

BEAUTY and wellness is the name of the game nowadays, with hundreds of beauty bars, salons and companies flooding the market. So, are you in or out?

Well, the Philippine Coconut Authority's Albay Research Center (PCA-ARC) is joining the bandwagon for beauty and wellness with their very own makapuno cosmetics.

Makapuno cosmetics underway

PCA-ARC's Dr. Maria Judith B. Rodriguez was granted a P100 thousand grant for a project proposal entitled, "Isolation, Characterization and Utilization of Galactomannan from Makapuno" in June 2005 by the PCA Central Office.

The study was inspired by the desire to find other value products that can be made out of the makapuno, a favorite dessert among Filipinos.

Compared to normal coconut, makapuno has higher content of galactomannan, a polysaccharide that is also classified as a gum.

Galactomannan gives the makapuno "its jelly-like solid endosperm (meat) and highly viscous liquid endosperm."

"Usually the meat is made into jam while the liquid endosperm is thrown away," says Rodriguez.

Little did Rodriguez expect that the liquid endosperm thrown out as waste could be the key to a potential value-added project from the makapuno.

"Newly harvested Makapuno liquid endosperm when applied as is on the hands and other parts of the body (including hair) has a soothing and moisturizing effect," she says.

That's when Rodriguez discovered that a hand and body lotion can be made out of it.

Rodriguez' study was able to develop an inexpensive and large-scale method of isolating the galactomannan from the waste makapuno liquid endosperm.

The whitish, fibrous powder of galactomannan produced, she later called "mak gum." A liter of waste makapuno liquid endosperm can make 50 grams of mak gum.

The hand and body lotion's major ingredient was the mak gum, while the virgin coconut oil was its anti-bacterial and fungal agent.

Why makapuno hand and body lotion?

Rodriguez says the galactomannan found in makapuno is a natural biopolymer that has a natural hydrating function. She says, "Its high moisturizing capacity then makes it suitable for formulations that treat dry, damaged or aged skin."

Compared to other hand and body lotion products out in the market, Rodriguez says the Makapuno product is better because it is natural, non-greasy and no allergic reactions have been observed upon its application.

PCA-ARC has also tried making Makapuno hand sanitizers and will be working on formulating facial masks, hair cream and hair gel, shampoo and conditioner and a body massage lotion out of the makapuno.

Not just for cosmetics

But other than cosmetics, a biodegradable edible film was also produced by the PCA-ARC out of the Mak gum.

Rodriguez experimented on the right proportion of mak gum percentage and viola, the biofilm proved to be an efficient

wrapper for candies and lumpia.

“There is now a high demand for stable, biodegradable wound dressing materials that can absorb body fluids and deliver medications to keep wounds clean and dry speeding the healing process. This biofilm will be tried as a gauze for wounds,” she says.

PCA-ARC is also looking at the potential use of the mak gum as toothpaste thickener. It can also serve as binder in medical tablets and a soft gel capsule for active ingredients dissolved in oil.

“In our coconut DNA fingerprinting and disease diagnostic laboratories (PCA-ARC), I tried mak gum (and it worked) as a substitute or in combination with agarose or polyacrylamide (both imported and expensive chemicals) as sieving matrix for electrophoresis,” Rodriguez shares.

Research and development of the makapuno value-added products should be continued until ready for commercialization, says Rodriguez. However, funding for the project is one of the major constraints. But right now, a more serious concern is the lack of supply of raw materials brought about by the damage Typhoon Reming caused Albay in 2007. Hence there is a need for massive planting of makapuno in the country to ensure sufficient supply for a wide range of food, cosmetic, pharmaceutical and industrial applications. PCA-ARC is already into commercial production of high yielding embryo-cultured makapuno seedlings.

But while the road is still long for the makapuno high-value products, Rodriguez can only sigh a big YES to the future potential of these products in commercial business.

“Compared to other countries, we have the capability to expand our makapuno plantings and the high-value products like cosmetics will follow,” she says. (*Lia M. Mañalac*)



Biotechnology encourages farmer education to boost agribusiness

By ANN BURGOS

THE National Techno Gabay Summit by the Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development (PCARRD) and the Department of Science and Technology (DOST) was held on July 9 and 10 at the SMX convention Center in Pasay City to celebrate the National Science and Technology Week.

In her presentation, Dr. Fay Lea Patria M. Lauraya, President of the Bicol University, said that greater agribusiness

productivity may be achieved through the application of science and technology-based solutions like forestry biotechnology.

It is about time that Filipinos should recognize the agricultural sector as a vital sector of the economy, being the second biggest contributor to employment in the country. It employs more than 1/3 or 37 percent of the labor force in the country. Despite the fact that this sector has consistently showed a growth rate between three percent and four percent, the sector's overall productivity is not



enough to improve its global competitiveness.

Productivity in agriculture and fisheries is very low due to the lack of added value activities, minimal added value due to low science and technology applications, minimal supply and industry activity chain management opportunities and inadequate extension services.

In fact, the Philippines' rank in Asia in the field of agricultural productivity slid from 2nd in the 1960s to the lowest in 2000.

Given this vital role in the economy, the Medium Term Philippine Development Plan 2004-2010 calls for the promotion of agribusiness to increase productivity and competitiveness of Philippine agriculture through a change

in perspective of the agricultural and fishery sectors towards the combination of science and technology and entrepreneurship.

To boost agricultural productivity requires the sector to view itself as a big enterprise. Agribusiness, just like any other business, should focus on raising productivity and increasing efficiency to attain rewarding profit. Challenges like water use efficiency, product mix diversification, securing an acceptable profit margin, cost of servicing debt, management of labor and mechanization option and collecting and understanding farm information have to be answered positively.

The Department of Agriculture-Biotechnology Program Office (DA-BPO) addresses this concern through its

Biotechnology Information and Organization Network (BIONet). DA-BPO has established two BIONet-Biocommerce centers, the first one in Tarlac and another in Butuan. These centers were established to provide BIOCCommerce opportunities to farmers by disseminating information on the latest trends in biotechnology that may be applicable to the regions' crops. Through these pieces of information, farmers are given more technological options in plowing the fields of their farmlands.

Aside from this, BIONet helps farmers get linkages with private sectors as markets for their crops.

The application of biotechnology in the agricultural sector is one of the best science and technology-based solutions



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to improve the productivity of the agriculture and fisheries sectors.

There are already several existing biofertilizers that help increase crop yields. These fertilizers also eliminate or prevent pests from destroying plants and they also help farmers earn higher incomes since these fertilizers require less use of costly chemical fertilizers.

Some sectors have been successful in the application of biotechnology. The Philippine Carabao Center (PCC), for example, has succeeded in breeding buffaloes through in-vitro fertilization for dairy production while the Institute of Plant Breeding (IPB) in the University of the Philippines- Los Baños (UPLB) has been conducting studies on virus resistant crops like tomato, eggplant, and abaca.

The production of biofuels will also help boost the Philippine economy. Government continues research and



The production of biofuels will also help boost the Philippine economy. Government continues research and development studies on Jatropha for biodiesel production.

development studies on jatropha for biodiesel production.

The lowly malunggay already made its mark as a source of nutrition and is now also a source of abundant biofuel.

Biotechnology is a key component of agricultural development and provides a cutting edge as the country maneuvers to become competitive.

Farming is hard work, but if we view farming as a business, the surplus at the end of every production cycle should be equivalent to more than the hard work, cost of inputs, land, labor and materials.

Science and technology has a cost, yet it is the farmer's desire to seek higher yield that will serve as motivation to invest and thus become more innovative using new knowledge.

In order to do this, a farmer must be educated, and that is the very purpose of the BIONet-BIOCommerce center—to educate farmers.



Giving hope for the bald Dr. Rainier Villanueva's *Lauat* herbal shampoo



RAINIERS Research and Development Institute (RRDI) is the first Filipino herbal company that has set up a manufacturing facility in America.

RRDI manufactures Lauat, an herbal shampoo for falling hair.

Dr. Rainier Villanueva, a neuro-surgeon by profession, is the man behind the phenomenal

Gugo steps aside

Lawat (scientific name: *Litsea glutinosa*) is an indigenous plant in Masbate. For a long time, Masbateños have used the leaves as shampoo.

Dr. Villanueva who hails for Masbate has used lawat as shampoo during his early years. "Ang fresh leaves kinukusot sa tabo na may tubig. Habang kinukusot mo siya lumalapot. Ang lapot niya is parang okra

Lauat shampoo. In America, Filipinos have been the top market for the herbal shampoo. But the market is slowly gaining ground for expansion, since it has also been exported to Germany, Italy and the Philippines.

Dr. Villanueva's Lauat shampoo has now taken over gugo and has made it even bigger in the market.

'pag niluto mo, it's slimy, it's very high in amuscilates" In Masbate, lawat has helped residents grow hair and maintain its rich black color.

Since gugo was the more famous anti-

falling hair shampoo in the 1980s, Dr. Villanueva tried to mix it with his native Masbate's lawat. In 1989, he conducted a clinical study on 136 subjects with falling hair to test if his combination worked.

The 136 subjects tested had two things in common, they were experiencing at least 30 strands of hair fall a day and have never used lawat for shampoo.

For four weeks, the subjects went in and out of his clinic for shampoo. After every session, hair fall strands are counted. As the weeks progressed, hair fall significantly decreased.

"So based on studies first week there is a 48 percent of falling hair improvement. Second week it's 53 percent improvement, third week 75 percent improvement and then the 4th week, 89 percent improvement ng falling hair. *Kumokonti ang nalalaglag* based on the study."

Due to his success, Dr. Villanueva patented his shampoo product and named it Lauat.

A growing business

Marketing his Lauat shampoo was difficult, says Dr. Villanueva. Especially since during that time, Aloe Vera's gugo shampoo has already captured the public's eye. But because of a documented and proven clinical study, success was not far behind for him.

Soon enough, his products made it big here and abroad.

From the renowned Lauat anti-falling hair shampoo, he ventured into anti-dandruff creams and leave-on conditioners.

Dr. Villanueva takes pride in saying that his products have been proven to be safe and unlike many commercial synthetic shampoo products, his have given the best results.

"*Maganda ang pagtanggap ng public* to the point that Palmolive came up with a variant made of gugo. *E 'di ka naman gagayahin ng malalaki kung walang demand,*" he says.



the interest and the market for the product, he thought of becoming a US product, to ensure that he is protected by its standards.

"Any shipment ng produkto mo sa US dadaan sa FDA. Whereas kung taga-roon, produkto ka doon, you're one of them, wala na. Once lang, kasi you're one of them. So yun ang naisip ko kaya I decided to set up a plant there."

Now, he says, his market for the Lauat shampoo in the US is slowly expanding, thanks to the overseas Filipino workers.

RRDI in America

Right now, Lauat shampoo is sold in the Philippines, Germany, Italy and some areas in the Middle East. Dr. Villanueva says, overseas Filipino workers have been his top entrepreneurs for marketing the product.

In America, Dr. Villanueva has set up the first Filipino herbal manufacturing facility. His facility is strategically situated inside Las Vegas, because he says, he aims to get all casinos to buying and using his shampoo.

Before the plant was set up in Las Vegas, Dr. Villanueva has been attending trade shows in the US that are sponsored by Filipino communities. When he saw

From doctor to businessman

Dr. Villanueva's shift from being a medical doctor to being a businessman he says is the best thing he has done. It was even more than his dream of being a doctor coming true.

And he encourages other doctors and scientists who have worthwhile discoveries to do so. He says, doing business with what you have discovered and proven to be a good product is one way of helping consumers get the best in the market.

"I'm not only after coming up with products that is aesthetically sound. But I can correlate it with the human body. So with my knowledge with the human body, *mas kumpleto ang aking perception sa paggawa ng produkto.*"

Irony and analogy

ASK the doctor. What should be included in our diet to make us healthier? In all likelihood, the answer would be fruits, vegetables, and fish. We should eat less meat and more of fiber. Hands up, the best source of nutrients are vegetables.

The Department of Agriculture had recently embarked its activities in promoting the planting and eating of vegetables through the *Programang Gulayan Para sa Masa* or more popularly known as PGMA. As a means of promoting vegetables, all its nutritious and therapeutic properties are highlighted during seminars, orientation, and seed distribution programs.

Despite the campaign of our country to eat more vegetables, our per capita consumption is only 33 kilos a year. In the Philippines, there seems to be an irony in vegetables. We grow vegetables but we prefer to eat meat. Add to this, in our vernacular, vegetables are synonymous to negative things. Take the case of the following:

- *Kalabasa* or squash is known for its golden yellow flesh. The color is indicative of being a rich source of vitamin A. However, in our vernacular, when one gets a zero score in a school examination, you are *nangalabasa*. Much more, *kalabasa* award has negative connotation of pitiable performance.
- *Kamote*. Closely related to the other meaning of *kalabasa* is *kamote*. When one is described as *nangangamote*, it means that you are not doing well in the school. Much more, some people would even advise a bum to go and plant *kamote*.
- *Kamatis*. Tomato is also a good source of vitamins. It is even promoted for its lycopene content. Lycopene is a substance that has anti-cancer properties. Now, in rites OF passage, when males undergo circumcision, and when the penis gets inflamed, we term it *nangamatis*.
- *Patola*. No policeman would ever be wanted to be called a *pulis patola*. What is *pulis patola*? Maybe a novice, inexperienced,



enced, non-performing, stupid and what nots.

- *Balimbing*. A starfruit is a description for a political turncoat. Or someone whose loyalty is to the one who is in power.

Or we get compared with fruits and vegetables, too. And here they are more.

- *Balat-sibuyas*, onion-skinned. When you are the type of person who easily gets irritated, you are described as *balat-sibuyas*

- If you are drunk your smell is described as *amoy chico*.

- An underarm odor is described as *amoy-bayabas* that sour broth dish or *sinigang* cooked in guava is sometimes called as *sinigang sa anghit*.

- For people who have long chin, your face is pictured as *manggang pico*.

- Another version is *nagmumurang kamatis* or *kamayas*, an old folk trying to act and look young.

- If you have lots of pimples, *kutis langka*. *Amoy durian* is bad smell.

- Papaya is termed as

pagkain ng pari, this could have been because papaya has papain and this substance is used as meat tenderizer. Women who have big breasts are described as papaya ladies.

- When one starts to show wrinkles, we call them as *kutis ampalaya na*.

- Big and wide-footed is called *paang-luya*. A thin and tall guy is *parang puno ng kawayan*.

- Dark complexions are *kulay-kape* or *duhat*, while the flawless and white complexion is *kutis labanos*

The list could be longer, and the reading public is encouraged to enumerate. What am I driving at? I am telling that these things we would live with. And it is about time that we create vegetable tag lines that are positive. Say, *ang kamatis ay pampanganda ng kutis*

Dr. Vivencio Mamaril is a member of the Bureau of Plant Industry Biotech Core Team.



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